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for a
National Lottery
in the UK

A report by John A Kay
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Foreword

I do not think that I would ever contemplate buying a ticket for a National Lottery. So I approached this project in an agnostic frame of mind. But I believe that a National Lottery should be implemented, as soon as feasible. It would raise substantial revenue - on the basis discussed in this report the returns might be £195 million in tax revenue and £325 million for 'good causes'. It would do so in a way that would give harmless pleasure to many people; as much as half the population could be expected to be occasional participants.

Although there have always been proponents of a state lottery, there is a degree of suspicion or distaste. Certainly no one could think that the desire to make a lot of money with minimal effort is among the most admirable of human motives, and equally no one should be under any illusion that the dominant motive behind participation in a National Lottery would be anything else. But this is an opportunity as well as a problem.

We already heavily tax smoking and drinking. We do so not because - as is often suggested - demand for these products is particularly insensitive to price. The evidence is that it is not. Nor is it because of the health risks associated with these forms of consumption. We taxed tobacco heavily at a time when there was no suggestion that there were any health risks associated with tobacco products. People do not mind paying heavy taxes so much when that taxation is associated with activities which they perceive as mildly sinful. Like smoking and drinking, gambling at long odds is an activity which can be taxed heavily without resistance or resentment. A National Lottery would exploit that puritanical streak. It would do so for the benefit both of tax payers at large and of good causes.

There are three broad categories of gambling activity. There are those where the social environment is a central part of the activity - bingo and casino gaming meet these requirements, for very different social groups. There are forms of gambling in which the chances of winning can be influenced by the application of skill and judgement - horse race betting, currency speculation, futures and options trading. Although most players lose, the knowledge that it is possible to beat the market encourages continued participation. And there is non-participative betting, mostly at long odds, in which there is no realistic prospect of changing these odds by the application of skill, and the pleasure of participation is the anticipation of winning which may be drawn out over a period of several days.

The motives of these different types of gambling behaviours are distinct and although there is evidence of common personality traits which attract individuals to several or to none of these forms of gambling, they are only weak substitutes for each other. There is, however, some evidence that alternative forms of long odds, non-participative betting are substitutes.

There are social problems associated with gambling. Some people participate beyond their means. For some - not necessarily poor - gambling is addictive. Forms of gambling which tend to attract this behaviour are those where the outcome emerges rapidly and which allow many bets in a single session.

This is particularly true of casino gambling, machine gambling and, to a degree, off-course betting, where there is both encouragement and opportunity immediately to reinvest winnings or to attempt to recoup losses. Lotteries are not like that, although modern lotteries are often designed to have some such elements in their make up. It would be desirable that such elements should be limited. But in the main, participation in a National Lottery would be innocuous if rarely profitable.

Lotteries are regulated everywhere and are, or have been, outlawed or restricted in many jurisdictions, because in the past privately run lotteries were often corrupt. This does not seem to be a problem in other western countries with state-controlled lotteries, and modern technology has helped maintain effective security. (Although with these technological capabilities go technological opportunities.) Britain's record over the last thirty years in legalising a wide range of gambling activities while keeping them honest is an impressive one and one which is admired internationally. It should not be difficult to maintain this record in the context of the operation of a National Lottery.

Others object to a National Lottery on the grounds that it takes away responsibility from the state, or from others, for activities which ought to be financed in a more direct and straightforward manner. My perspective is a rather different one. A lottery for large prizes is simply an activity which because of its special problems has historically been prohibited and requires continued close regulation and control. It is now safe to introduce it but it is also particularly appropriate to tax it at a very high rate. It is no more sensible to say that activities of public importance and benefit ought not to be financed from the proceeds of a National Lottery than it is to say that they ought not to be financed from the proceeds of heavy taxes on smoking and drinking. If there is a problem in that, it lies in the inequity to smokers, drinkers or lottery entrants rather than in any immorality or inappropriateness in the source of finance.

But of course smokers, drinkers and gamblers choose to smoke, drink and enter lotteries. Yet, with all these taxes there is some ground for concern about who it is that does choose to contribute to them. The social composition of participants in gambling varies widely. Bingo and off-course betting on horse races is largely the province of lower income groups. Casinos are the resorts of the rich. The evidence we have found, and the evidence of other countries, suggests that participation in a lottery would be fairly evenly spread across income groups and social classes. This means that - as with any other flat rate tax - a lottery would be regressive in its impact. It would be the more regressive if the proceeds of the lottery were largely distributed to activities - particularly support for the arts - where the benefits are largely derived by higher income households. This is an objection, but not a very cogent one. Perhaps the most important point is that these issues of progressivity and regressivity are best looked at in the context of the taxation system as a whole, and not in the context of each individual measure. And the element of choice is important; more, perhaps, than for taxes on any other item of consumption. No one needs to participate in a National Lottery, or to accept the rather heavy tax on their participation. And if gambling is the popular sport which it appears to be, it is surely in the public interest to channel this into a well-planned National Lottery.

A National Lottery might have damaging effects on other established activities. It would imply substantial loss of revenue for football pools. It would also, in the form in which it would prove most attractive to participants, be likely to damage small lotteries - such as the instant lotteries which are now widely sold in confectioners, tobacconists and newsagents. It would have less effect on the small lotteries which support sporting or religious activities, where the hope of a prize is only part, and often a minor part, of the motive for entry. The fact that the introduction of a new activity would damage old ones is not in itself a valid argument against it. If this line were taken generally there would be no new products, no new industries, and no new firms. But the fiscal and regulatory background should be such that the new venture is successful if, and only if, it provides something which the public wants more than that which they already have. This is important in considering how a lottery should be taxed.

A ticket for a lottery is, in economic terms, a bad buy. Few comparable lotteries return more than half the takings in prizes to participants although the evidence we have found suggests that lottery promoters may be too greedy for their own good. Economists have not found it easy to explain why people should wish to enter lotteries. This seems mainly to be a difficulty for economists, however - most people encounter no difficulty at all in seeing why people choose to enter lotteries. The problem here does indeed lie with economics rather than the world, and the need to account for this apparently irrational behaviour has indeed led to some rethinking of basic principles of economic theory.

There is evidence that many people over-estimate the probabilities associated with unlikely events, and to under-estimate those that apply to probable events. That is why not enough people back the favourite in a race, and betting on long shots offers a particularly poor return. And many people enter lotteries because they do not fully grasp that unlikely events are indeed very unlikely. No statistician would lie awake at night worrying about a one in a million chance. But there are so many entrants to a lottery that for some people those one in a million chances do come off. And participants also derive pleasure from anticipating outcomes even when these outcomes do not occur. That pleasure may have a social as well as a private function. It is only the lottery or the Pools which enable most of the population to continue to imagine that they might one day be rich. This may be useful in sustaining acceptance of a capitalist economy, which requires a majority who are not rich to tolerate a minority who are. This is, implicitly, one of the reasons why many socialist thinkers have long been hostile to this kind of gambling. I am not sure that this ideological debate is a fruitful one to pursue. It is safer, and probably more correct, to regard participation in a lottery as innocuous fun rather than an instrument of social control.

I had not understood, until I learnt of the experience of other countries, how complex a modern lottery typically was. My conception of a lottery was of a giant drum from which a winning ticket was triumphantly extracted from time to time. Technology and the easily bored tastes of modern consumers mean that most lotteries are now far more elaborate than that.

A good lottery sustains the interest of its customers in the process of the lottery by giving them a series of opportunities to win. You may have one chance of a small prize when you buy the ticket, and a later opportunity to win a grand prize. There may also be a super jackpot which rolls forward from lottery to lottery.

A good lottery may combine the instant gratification of the fruit machine with the suspense and anticipation of the revolving drum. It is best to maintain the illusion that you might win the big prize by offering many small ones. And unless the design of the lottery changes and evolves relatively frequently, consumer interest diminishes. Around the world, much expertise has developed in the design of lotteries to meet consumer needs, and it is clear that a well-designed lottery could raise substantially more revenue than one which failed to meet the requirements of its customers so effectively. Marketing lotteries, in short, is no different from marketing any other consumer product. Since there are real objections to stimulating demand too far, it may be appropriate here to impose some restraint or look for some self restraint. But it will be easier to err on the side of making the activity too dull. Excessive participation is a less serious problem for a lottery than for many other forms of gambling.

The disposition of the revenues of a lottery is a central question - for many the central question. There is widespread consensus that the proceeds of a lottery should not simply disappear into the Exchequer, should not substitute for central and popular items of public spending like health and education, but should be devoted to items of the kind suggested in the Government's White Paper - sports, the arts, and heritage. Few of those to whom I spoke found it easy to rationalise this strongly felt prejudice. There is not much evidence to suggest that the degree of participation in a lottery of this kind would be very sensitive to what happened to the proceeds, although a number of people would no doubt use the funding of good causes as a moral rationalisation for their indulgence in mildly sinful excitement. Certainly our analysis of foreign lotteries suggests that it is mainly the prizes that matter, and while interview studies have suggested that people would be more likely to enter if the lottery favoured good causes this is, perhaps more than any other market research question, one on which answers should be taken with a pinch of salt.

So if punters would gamble anyway, why should the money not be used for education spending, or for the reduction of the national debt and the excessive public sector borrowing requirement? Most people would feel that education spending, for example, was 'more important' than arts expenditure. However, this is already fully recognised in the fact that we spend twelve times more of public money on education than on the arts (more than £7 billion by the Department of Education and Science versus £0.6 billion for the Office of Arts and Libraries).

A more relevant question, to which the answer is a good deal less obvious, is whether a pound of additional spending on the education system would generate more or less social benefit than a pound of additional spending on the arts. It may be argued, and I believe there is something in it, that the rather general idea that 'education is more important' makes it difficult to spend even marginal amounts on activities like sports, arts and heritage.

There is also a good deal to be said for finding alternative mechanisms of public funding for activities where it is important that there should be plurality in decision making. This is particularly forceful in the arts where people necessarily have strong prejudices about what is right and wrong, and independence from political interference or censorship is rightly highly-prized, and the only certainty is that many of these prejudices will in time prove to be mistaken. There is something to be said for directing lottery revenues generally at activities which are to a degree unfashionable. But it would be unwise to take that too far.

For similar reasons, a lottery is a desirable form of funding for one-off items, particularly capital projects (although this need not exclude the provision of associated endowments for running expenses). That makes it less likely that the proceeds of a lottery would be directly substitutable for mainstream public expenditure. Some advocates of a lottery argue strongly that lottery income should be clearly identified as additional support for sport, arts, and heritage, so that direct public spending on these items should be set at whatever level it might achieve in the absence of the lottery. The White Paper is conspicuously evasive on this point, with a reference to the fact that "the Government will not make any case by case reduction in conventional expenditure programmes to take account of awards from the lottery proceeds" (page 8).

There is no mechanism by which such additionality can be guaranteed. Nor should there be. Comparison with the indexed level of direct spending will provide an indication of the degree to which finance from lottery revenues is indeed additional, and the arts, sports and heritage lobbies will properly feel aggrieved if, over time, substitutes for ordinary public spending is on a one-for-one basis, or close to it. In practice, the revenues likely to be available from the lottery are sufficiently large that this is improbable.

Because the success of a lottery is very sensitive to the way in which it is designed and marketed, it is important that there should be consumer-oriented management. It would not be wise to entrust it to Inland Revenue or Customs and Excise, nor should a lottery ticket resemble a tax return. State lotteries in other countries are run with some flair and imagination. The Irish Post Office has made its National Lottery a considerable success. But the notion that management of the lottery should be contracted out is, I believe, a good one. This should be done under the control and supervision of a National Lottery Board of the great and good.   .

The principal criteria for membership should be a combination of commercial experience and an interest in those public activities which a lottery would be designed to support. That board would have responsibility for awarding the management contract, supervising compliance with its terms, distributing the revenues, and re-awarding the contract or not doing so as seemed appropriate. The board would take overall responsibility for assigning the proceeds, although it would be natural for it to have sub-committees assessing priorities in particular areas.

These priorities should emphasise experimentation over the safe, should emphasise capital projects over current running expenses - while not necessarily being afraid to provide endowments to ensure that activities it supports actually continue - and should have only formal direct political accountability. It would be particularly inappropriate for 'is he or she one of us?' to be a relevant question in relation to appointments whose very purpose is to secure plurality. Although there is never a distinction between government money and public money, the difference in emphasis is particularly clear in this context.

A lottery should be subject to tax as well as making a contribution to good causes. The introduction of a lottery should not lead to a loss of existing tax revenue. Nor should a lottery be allowed to attract business from the Pools merely because it is less heavily taxed. I suggest that the tax rate on the lottery should be 15% and a minimum of 25% of revenue should go to good causes, so that the overall levy would correspond to the existing effective rate of football Pools duty of 40%. It is hard to believe that the popularity of a lottery in the United Kingdom will ever reach the levels achieved in Spain, where, particularly at Christmas, entry is a national obsession; people give tickets to each other, and the identity of the winner of the grand prize is awaited as a national event akin to royal weddings and cup finals. But in both its direct and indirect effects, a National Lottery would bring a little more excitement and a little more sparkle into life.

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1   Introduction

The government is committed to the introduction of a National Lottery for the funding of good causes. Following the publication of the White Paper[1] earlier in the year, the newly elected Conservative Government created a new Ministry of National Heritage, one of whose main tasks is to administer and supervise the introduction of the National Lottery, and establish the spending priorities. Great hopes for increased funding for the arts, sports and other cultural activities, have been raised, and there is a general expectation of a substantial amount of money to be collected through the new lottery.

Many practical questions need to be addressed before the National Lottery is successfully established. Some criticism has to be met, although generally the political reception of this initiative has been overwhelmingly positive. A study to evaluate the potential of the National Lottery is, therefore, timely.

This report represents the first comprehensive overview of the options for the introduction of a new lottery. It is based on an extensive assessment of the experience in other countries, and explicitly takes into account the degree to which lotteries are different from other gambling activities, and the extent to which a lottery is likely to substitute for other forms of gambling. The study outlines the operational structures which are likely to offer the biggest potential for raising revenues for good causes, and offers guidelines for the appropriate mechanisms for the distribution and taxation of the proceeds.

In Section 2 the report reviews the background and the history of lotteries, which are not new to the UK and are common in most countries. But, contrary to most European countries, the legal position in the UK is tightly defined, and lotteries, certainly those offering large prizes to the general public, are not permitted.

Section 3 documents the views of a selection of groups who are either positively or negatively disposed towards the establishment of a National Lottery. They comprise the religious communities, whose views range from outright opposition to a hands-off approach of benign tolerance. The views of one of the potential beneficiaries illustrate their positive attitude, and their great expectations.

Section 4 deals with the ambiguous position of Lotteries as a form of gambling that has been considered undesirable, and has been made either illegal or tightly regulated by the state. The economic and social characteristics of gambling are reviewed, leading to a classification of different forms of gambling and a better understanding of the potential popularity of a National Lottery.

Section 5 reviews the operations of lotteries in several countries. Two country studies, for the US and Ireland, offer some insights into development and spread of lottery games with a complex combination of characteristics. The empirical investigation of a sample of lotteries allows the estimation of the success of a lottery in raising revenue as a function of several key characteristics.

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[1] Home Office, *A National Lottery - Raising Money for Good Causes*, London, HMSO, 1992.

Section 6 addresses the issue of taxation of gambling, and the justification for making the National Lottery subject to a lottery tax.

In the final section the study addresses directly the introduction of a National Lottery in the UK. Its revenue potential is assessed, as is the question of the appropriate taxation of the proceeds. It also considers the appropriate management and supervisory structure.

A series of appendices offer additional background information on gambling, and contain the more technical work behind the findings of the empirical investigation of lottery operations.

2 History and Background to the Government White Paper

This Section reviews the background and history of lotteries in the UK. There is a long history of legislation over 500 years, which led to a tightly defined legal position. The 1992 White Paper marks a new departure for government policy.

Lotteries were a popular form of gambling in the UK until concern about their potential adverse social effects led to their abolition in the 19th century. Small-scale lotteries, within the context of private or charitable functions, were again permitted later and, in spite of restrictions on advertising, have proved to be extremely popular.

2.1 An historic overview of lotteries

The history of the lottery goes back a long way. Lotteries are mentioned in the old testament, and the rulers of Babylon reputedly raised state revenues by holding public lotteries. Lots and dice were also often used in making decisions in legal and religious matters[2].

In Western Europe, the first private lottery with monetary prizes was probably held in Florence in 1530. Lotteries then spread to other Italian cities and to France[3] and England[4] and, from there, to the American colonies[5]. By the end of the eighteenth century, lotteries were common in most Western countries, including Australia, Belgium, Denmark, Mexico, Peru, Poland, Portugal, Spain, Sweden, Switzerland, and in the UK.

In the nineteenth century, lotteries were adopted in other countries, particularly in South America, but came under increasing legal restrictions in Western Europe and the United States. While the tendency was originally to outlaw private lotteries, and to substitute public ones, even these eventually came under fire. Public lotteries were criticised as being public nuisances and immoral; fraudulent behaviour was considered to be a problem, particularly in the United States.

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[2] The drawing of lots is repeatedly referred to in the Bible as being regularly used to discover God's will in decisions on a number of issues: the election of a king (1 Samuel, 10:20-1) and of cult functionaries (1, Chronicles, 24-6); the selection of a "scapegoat" (Leviticus, 16:8-10); the selection of a date for some future action (Esther 3:7; 9:24).

[3] In the seventeenth century, lotteries were used to finance the building of the Church of Saint-Sulpice and of the Military School in Paris.

[4] Queen Elizabeth chartered a lottery which was drawn in 1569 and offered a variety of monetary and non-monetary prizes (one prize rendered the buyer free from arrest for seven days except for a major crime). Other drawings followed in 1569, 1585 and 1612. This last was authorised by James I to raise funds for settlements in the New World.

[5] The Colonial Government resorted to lotteries to provide funds for a number of purposes: for the defence of the seacoast against the French (1744), for the building of fortifications in New York (1746); for the construction of colleges and churches.

In addition, Governments raised increasing revenues from direct taxation and were no longer dependent on public lotteries for fund-raising purposes.

Governments returned to lotteries in the late nineteenth and early twentieth centuries, when the need to boost public revenues re-emerged. Lottery receipts were mostly used for charitable purposes, rather than for general government operations. Today, lottery receipts in most South American countries go to charities, and the revival of the French lottery (in 1933) was for the benefit of farm subsidies and veteran benefits. Lotteries were organised for welfare purposes in Australia, Gibraltar, Greece, Ireland (the Irish Sweepstakes) and Sweden.

After World War I, a specialised form of lottery became widespread: interest lotteries[6] were introduced in a number of countries including Australia, Belgium, France, Germany, Italy and, more recently (1956), in the United Kingdom. Soccer pools served many of the functions of lotteries in a number of European countries. Such pools are major forms of gambling in Britain, Italy, Norway and Sweden. Among the projects which have been financed with the help of a Lottery are the British Museum, Harvard University, and the Sydney Opera House.

2.2   Lotteries in the UK

The large number of Acts of Parliament concerning themselves with lotteries and gambling reflects a changing balance between many different considerations. There is the censoring distaste for gambling, a concern about fraud and corruption, a recognition that outright prohibition may stimulate rather than suppress criminal activity and a desire to raise revenues both for charitable purposes and the government itself. Table 1 summarises the acts which have been passed.

State lotteries have existed in Britain since 1569. The first recorded lottery in England took place under state auspices in that year to raise money for the repair of the Cinque Ports. Lotteries were held thereafter to finance such schemes as English plantations, fresh water supplies for London, repairs of damage done to the fishing fleet by the Spaniards, the ransom of English slaves in Tunis, and the maintenance of poor and maimed soldiers.

Private lotteries have always been the subject of state regulation, and the 1698 Parliamentary Act specified that all lotteries not sponsored by the state were illegal. Opposition to state lotteries emerged at the end of the 18th century because of illegal practices connected with them (such as illegal betting on the outcomes of lotteries), and the social evils to which they were seen to give rise. The last state lottery was held in 1826.

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[6]   In an interest lottery, subscribers buy Government bonds and the interest, instead of being paid to the individual purchaser, is put into a lottery prize pool.

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Table 1	An Overview of Parliamentary Acts dealing with Lotteries in Britain
1698 Parliamentary Act	Prohibited all lotteries not authorised by Parliament for state and certain public purposes.
Art Unions Act 1846	Exempted Art Unions[1] from the prohibition of lotteries.
Betting and Lotteries Act 1934	Prohibited lotteries whether promoted in Britain or abroad, subject to exemptions for: • Art Unions[1]; • private lotteries[2]; • small public lotteries incidental to a bazaar or sale of work.
1956 Small Lotteries and Gaming Act	Allowed, subject to registration with the appropriate local authority, small public lotteries conducted for charitable, sporting or other purposes.
Lotteries and Gaming Act 1962	Introduced legal interpretation of the references to private gain in the Betting and Lotteries Act 1934.
Betting, Gaming and Lotteries Act 1963	Brought together in one Act all the laws relating to lotteries contained in the Acts of 1934, 1956 and 1962. The lotteries exempted from the general prohibition remained: • Art unions; • small lotteries incidental to certain entertainments; • private lotteries; • small public lotteries conducted for charitable, sporting or other purposes
Lotteries Act 1975	Empowered the Secretary of State to make regulations prescribing provisions to be included in any lottery scheme run by a society or local authority.
Lotteries and Amusements Act 1976	Consolidated existing enactments relating to lotteries, prize competitions and amusements with prizes.
Lottery Regulations 1977	Provided that as of 1st May societies could run larger lotteries, local authorities were allowed to run lotteries on the same terms as societies, the Gaming Board assumed certain responsibilities in relation to lotteries and public lotteries could be promoted more freely. No restrictions on advertising.

Notes:
1   Voluntary organisations formed for the purpose of distributing by chance works of art.
2   A private lottery is confined to members of a society established for purposes not to do with gaming or betting, for persons all working or all residing on the same premises.

A number of Royal Commissions have investigated the benefits, or otherwise, of staging lotteries. In spite of the fact that all lotteries had been declared illegal, a 1932-33 Royal Commission found that private and small public lotteries flourished. This Royal Commission was opposed to large lotteries. It was claimed that:

- large lotteries called for no skill or knowledge, but exalted in the taking of unnecessary risks and encouraged a belief in luck;

- lotteries appealed with special force to those in straitened circumstances;

- lotteries lent themselves to exploitation and fraud.

However, the Commission did conclude that small private lotteries, and very small public lotteries, did little social damage; this led to a relaxation of the laws prohibiting lotteries in the Betting and Lotteries Act 1934.

The 1949-51 Royal Commission found that, in spite of these regulations, tickets in private and small lotteries were often sold to members of the public who were not legally eligible to participate. The Royal Commission also recognised the potential for fraudulent behaviour. After some public discussion, the 1956 Small Lotteries and Gaming Act introduced further relaxations in the regulations governing lotteries; lotteries had to be registered, although this was not a demanding form of regulation.

Lotteries continued to be a popular form of gambling. The 1978 Royal Commission estimated that the number of societies registered, or re-registered, annually for the purpose of operating lotteries had probably reached 100,000 by 1975[7]. This was at a time when there were restrictions on advertising, so that lottery tickets could not be sold openly in shops.

The Commission took the view that, subject to two qualifications, lotteries were a harmless form of gambling and provided benign entertainment. The first was that all lotteries must be strictly controlled, since they present greater possibilities for fraud than betting or gaming. The second qualification was that people should not be induced to spend more on lotteries than they could afford. In consequence the scope of legal lotteries remains restricted.

The Royal Commission also observed the following types of abuse:

- Abuses where organisers of a lottery were technically in breach of the law, for instance by running a private lottery not confined to members of one society, or for exceeding the limits allowed for a public lottery, but without a resulting commercial gain.

- The establishment of a buffer society, between participants in the lottery and the good cause, established with the aim of bolstering expenses. As a result, only a small proportion of the stake money reached the charity for which it was apparently intended.

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[7] Royal Commission on Gambling, Final Report, Volume One, July 1978.

- 'Donations' from lotteries, including a significant element of remuneration, for officials who may have participated in the sale of lottery tickets.

These criticisms led to the appointment of an Interdepartmental Working Party on Lotteries which proposed that the Gaming Board should take a supervisory role and be informed of all lottery registrations, and that all lotteries for fund-raising should be registered. It also recommended that a limited number of large lotteries for national good causes should be permitted.

As inflationary pressures accelerated, pressure also grew to raise prize levels; this was achieved with the help of the Lotteries Act 1975 and, in 1977, the (Commencement No. 1) Order. The effect of this was to permit societies to operate larger lotteries, to allow local authorities to run lotteries on the same terms as societies, and for public lotteries to be promoted more freely.

2.3   The current legal position in the UK

The current law on lotteries in Great Britain is summarised in the Lottery and Amusement Act 1976, and is based on the fundamental principle that all lotteries (including foreign lotteries) are unlawful except those provided for by the Act[8].

The four types of lottery permitted are:

- small lotteries incidental to certain entertainments;
- private lotteries;
- society lotteries[9]; and
- local authority lotteries[10].

Society and local authority lotteries are those liable to attract the general public. In both cases the aim of the Act is to provide ways of funding good causes.

A number of detailed lottery regulations in the 1976 Act, and subsequent Lotteries Regulations, impose additional restrictions on UK lotteries relating to:

- limits relating to turnover size;
- the amount of the proceeds appropriated for prizes;

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[8]   Lotteries in Northern Ireland are regulated by the Betting, Gaming, Lotteries and Amusements (Northern Ireland) Order 1985.

[9]   A lottery promoted on behalf of a society established and conducted wholly or mainly for one or more of the following purposes:
   a)   charity;
   b)   participation in or support of athletic sports or cultural activities;
   c)   other, not described above, but which are neither purposes of private gain nor of any commercial undertaking.

[10]   Local authorities may organise lotteries with the intent of raising funds for specific purposes.

- the frequency with which lotteries may be held;
- the maximum ticket costs and prize values.

Thus, the maximum level of turnover and prizes varies with the frequency with which such lotteries are organised. For quarterly lotteries, turnover should not exceed £180,000, and the maximum single prize may be at most £12,000. In all cases, tickets should be priced at £1 or less. The Act also states limits for the allocation of revenues; no more than 50% of total revenues should be allocated to prizes, and 25% to expenses, leaving at least 25% available for good causes.

In addition, all societies organising lotteries must be registered with local authorities. Those lotteries with a turnover exceeding £10,000 should also seek registration with the Gaming Board, which must be satisfied that the scheme will be properly conducted.

The 1990/1991 Gaming Board Annual Report indicates that, for those lotteries registered with the Board, the allocation of revenues has been as follows: 56.5% to good causes, 26.3% to prizes, 17.2% to expenses.

The Act does not prohibit the advertisement of lotteries, but requires that all information regarding the lottery is appropriately presented both on tickets and on any advertisements. Lottery tickets cannot be sold to persons under the age of 16 and in premises used mainly for other gambling activities.

3   Summary of Views on a National Lottery

In this section, we first outline the Government position, as presented in the recent White Paper; then summarise views of religious communities and the Sports Council on gambling, and on the introduction of a National Lottery.

The current Government proposal envisages the establishment of a National Lottery, which would be operated through a franchise awarded to a private operator. The nature of such a lottery is very firmly defined by its objective: to raise money for public benefit. No restrictions on the maximum size of prizes are envisaged, although tickets should not be sold to under-aged customers, or in betting shops.

More serious restrictions on the likely design of a National Lottery are likely to derive from the Government's desire that other forms of gambling should be able to compete on equal terms with a National Lottery, and that any shortfall in taxation revenues, as a result of the introduction of a National Lottery, will have to be made up by a new lottery tax.

Within the Christian community, the Methodist Church holds the strongest views on gambling. While the introduction of a National Lottery is tolerated, it should be discouraged, and advertising should not be permitted. In contrast, the Catholic Church takes a more practical approach. While it is concerned about the potentially destructive effects of a National Lottery on gamblers, its main concern lies with the loss in public expenditure for essential services. The Muslim community is strictly opposed to the introduction of a National Lottery. However, the Jewish community, although opposed to gambling as such, is in favour of the beneficial impact it may have on charities.

We also discuss the view of one of the bodies which is most likely to be affected by the introduction of a National Lottery - the Sports Council. They believe that any possible drawbacks associated with a National Lottery will be more than outweighed by the benefits that it will bring to the arts, to sports, and to national heritage.

3.1   The view of the Government: the proposal for a National Lottery

In March 1992, the Secretary of State for the Home Office published a White Paper[11] containing the Government proposal for the introduction of a National Lottery[12].

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[11] Home Office, *A National Lottery Raising Money for Good Causes*, HMSO, 1992.

[12] The interest in a national lottery to raise money for good causes dates back to the Rothschild Report. More recently Mr Ivan Lawrence MP presented a private member's bill in January 1991.

The Government does not wish to encourage gambling as such. The motivation, and main benefit of the new lottery, will be to raise money for good causes[13].

The scheme proposed by the Government assumes that the operation will be franchised to outside contractors. For this reason the Government does not intend to regulate the detailed structure of the game. Only broad controls will be implemented, along the lines of existing lottery law. Appropriate provision should be made for awarding contracts to operate the National Lottery, distributing the proceeds, and regulating and controlling the operations. The day-to-day management of the lottery will remain with the contractors.

The main aspects of the current proposals can be summarised as follows:

- The statutory four-times-a-year limit on the frequency of the lottery will not necessarily be applied to the National Lottery.

- The legislation will have to consider the minimum proportion of turnover available for good causes (possibly around 1/3) and a maximum proportion available for expenses (possibly around 1/6). The remainder, after taxation, would be available for prizes.

- There will be no limit on the level of the maximum prize.

- Any commercial advertising of the National Lottery would provide factual information about the lottery, and the good causes which will benefit. Controls are thought necessary to prevent undesirable advertising.

- The minimum age for participants will remain 16. The restrictions on selling lottery tickets in betting shops and on similar premises will also be maintained. Apart from these limitations, National Lottery tickets will be widely available.

The Government recognises that the introduction of a National Lottery will have effects on other forms of gambling. Among the range of commercial gambling activities, football pools are the most likely to be affected. Charities running small lotteries may also experience some decrease in their revenues[14]. The Government is prepared to introduce changes in the statutory provision of commercial gambling and small lotteries to help them to compete on equal terms with the National Lottery.

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[13] The concern about the potential impact of foreign lotteries in this country has also been mentioned as a possible justification for introducing a UK national lottery. The position of gambling with respect to the single EC market, however, is not yet clear. The Government believes that the current regime prohibiting large lotteries applies also to foreign lotteries marketed in this country, and it is compatible with EC laws. Any maintained prohibition for a foreign lottery will, however, be very difficult to enforce, as current experience already shows.

[14] It is impossible to estimate the total revenues that charities are able to receive from lotteries, since figures for all such lotteries are not centrally collected. For the 855 lotteries registered with the Gaming Board, total income in 1990/91 totalled £15 million.

It is also accepted that expenditure on a National Lottery will, to some extent, be diverted from other forms of taxed activities. In order to maintain Government revenues, stakes in the National Lottery will be subject to a new lottery tax.

The Government considers that the arts, sport, heritage and charities should be the beneficiaries of the National Lottery. In particular, part of the proceeds should be used for projects of lasting benefit to the nation. It is essential, however, that none of the beneficiaries of the National Lottery should assume that it will provide them with a permanent stream of income.

3.2 The views of the Christian Church

The strongest position on gambling amongst the main Christian Churches has traditionally been that of the Methodist Church. Indeed the Methodist Church has often been seen, at least informally, as spokesman for other Churches and groups opposed to gambling generally. Its 1936 Declaration[15] urged an absolute rejection of gambling on ethical grounds. It claimed that:

"The more widespread gambling practices become, the more evident are the evil results as revealed in the record of crime, commercial disaster and human tragedy. These shows that addiction to gambling tends to create moral indifference and to undermine moral responsibility".

Expressed more than fifty years ago, this statement reflects the concerns of that age, when illegal gambling was a part of the everyday life of a large number of very poor people. More recently, as a result of a changed social environment and the increase in living standards, the Church has moved towards a more tolerant position. This was voiced in a paper published in 1974[16], where gambling was viewed less as a distinct activity in itself, but more as a minor part of the entertainment and leisure industry.

Gambling, therefore, no longer presents an urgent ethical question, although the Church still recognises its destructive potential, and advocates its strict regulation.

The Methodist Church's concern is now less with prohibition than with regulation of a distasteful activity. If the practice is unregulated, or may be subject to abuse and addiction, there are reasons to be apprehensive. However, three principles have been laid down with respect to gambling:

(1) Regulation authorities should discourage gambling, but should interfere as little as possible, while measures should be adopted to prevent socially damaging excesses, and the incursion of crime;

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[15] Methodist Conference, A Methodist Declaration on The Gambling Problem, 1936.

[16] R.S. Preston, *Ethical Aspects of Gambling: a New Look*, Crucible, 1974.

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(2) there should be no advertising for gambling; and

(3) gamblers should be made aware of their losses.

Despite this more liberal approach to gambling, including lotteries, the Methodist Church has taken a very negative stance on the National Lottery scheme proposed in the Home Office White Paper. The highlights of its comments, contained in a recent document[17], are:

- The Royal Commission on Gambling (1978) concluded that gambling is a serious matter and should not be stimulated. The current proposal is described to be likely to expand the gambling market by up to £ 3 billion a year. For this target to be achieved, a large advertising campaign will be necessary, contrary to the recommendations of the Commission.

- British citizens gamble more than any other Community nationals, and gambling in Britain is concentrated among the less well off. The proposed National Lottery will, therefore, constitute a tax on the poorest. Furthermore, if the Arts are the beneficiaries of lottery revenues, then the effect of a National Lottery will be even more regressive, since better-off people generally benefit more from such subsidies[18].

- Various arts organisations are concerned that any increase of funding from lottery revenues will reduce government contributions. The net positive effect on funding may then be less than anticipated.

- Since gambling is experiencing a declining trend in patronage, the introduction of a National Lottery is likely to displace football pools in the market. Football pools are heavily taxed (at 40% of total sales) while funds raised by the National Lottery will directly benefit the arts.

- The displacement of pools in favour of the National Lottery will decrease tax revenues which are spent on essential services, and replace these with contributions to recreational activities ("replace hospital beds with opera seats").

- There is no threat of a European common market in lotteries and, therefore, no need to introduce a British lottery to retain revenues in this country. It is clear that Community states benefiting from small lotteries are determined not to have these revenues swamped by larger lotteries, and there is a basic agreement within the Community that lotteries should not operate across borders[19].

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[17] *The Methodist Church and the proposed National Lottery*, 12 March 1992.

[18] In Section 7 we comment in more detail on this aspect of a National Lottery.

[19] Peter Lloyd (Home Office Minister) written parliamentary answers, 12 March 1991 and 11 December 1991.

• It is not clear who the beneficiaries of a National Lottery will be. Arts, sports and heritage groups may lose other public contributions, the Exchequer will lose tax revenues from the football pools which may be only partly offset by proceeds from the Lottery tax. The only certain winner will be the company which will be awarded the operations of a "further private monopoly".

At the other end of the spectrum of positions on gambling within the Christian community is the Catholic Church.

The Catholic Church shares the concern expressed by the Methodists in respect of gambling and the resulting socially damaging excesses and incursion of crime, but adopts a more liberal stance towards advertising and the scope for consumer awareness.

It takes a relatively relaxed view of gambling in general, and lotteries in particular. Possible serious social consequences, such as abuse and addiction, give cause for concern. But, it is recognised that, for most of the population, gambling is no more than a leisure activity, and the Church is not prepared to sacrifice the freedom of most to safeguard a small minority from abuses and addiction.

The Catholic Church's main concern is the potential displacement of contributions to general public expenditure by voluntary contributions. The threat that a National Lottery will pose to small lotteries, some of which are organised by local Catholic groups, is not seen as particularly important; the motivation behind participation in charitable lotteries is thought to be quite different from that inducing people to take part in a National Lottery[20]. Small lotteries have already experienced a decline in patronage, and they should no longer be seen as a regular way of collecting funds for communal activities.

3.3 The views of other religious groups

We have also spoken to representatives of the Jewish and Muslim faiths.

Gambling is entirely forbidden according to the laws laid down in the Qur'an[21]. Since participating in a lottery is a form of gambling, this would also be strictly forbidden to religious muslims, and the clerics we spoke with expressed their opposition to the introduction of a National Lottery.

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[20] Casual evidence suggest that a sizeable proportion of prizes in Catholic Church lotteries are not claimed. If this evidence can be corroborated, it will support the view that participation in such lotteries has mainly a charitable motivation, quite different from the inducement to participate created by large lottery prizes.

[21] "O ye who believe, liquor and gambling, idols and divining arrows are but abominations and satanic devices. So turn wholly away from each of them that you may prosper. Satan desires only to create enmity and hatred between you by means of liquor and gambling and to keep you back from the remembrance of Allah and from Prayer." (5:91-3)

In contrast, the Jewish position is entirely relaxed. Although gambling, as such, is discouraged in the Jewish faith, the fact that the proceeds of a National Lottery would go towards a good cause would far outweigh reservations of this kind. Indeed, a National Lottery is in operation in Israel.

3.4   The views of the Sports Council

The position of the Sports Council regarding a National Lottery is one of enthusiastic support. The Council expressed its position on the issue at the time the National Lottery private bill was discussed.

The position of the Council is supported by the findings of two pieces of research which it sponsored, and which have been made available to us. On the basis of the results from these two surveys, the Council estimates that a National Lottery will be able to generate around £2 billion turnover per annum. On the assumption of a potential 30% share of the gross figure devoted to good causes, the arts, sport and national heritage will between them receive around £600 million a year.

Whatever the allocation to sport will be (the Council believes it to be a third of the available total), these resources will provide an important contribution towards financing the £600 million per year (£3 billion over five years) necessary for "much-needed" projects[22]. The funding of sport by the public sector has fallen in real terms recently, making this particularly beneficial.

In a recent briefing note[23], the Sports Council emphasises the following points:

- It is in favour of allocating a share of the available total funds to charities which will suffer from a reduction in participation in small lotteries after the introduction of a national game.

- The evidence from other countries highlights the potential role of national lotteries to help finance a number of important initiatives (such as the Sydney Opera House and the Olympic Games in Moscow and Mexico).

- Foreign experience also suggests that other forms of gambling, such as football pools, need not suffer. A thriving pools business can co-exist with a successful National Lottery as long as football remains a popular sport.

- The introduction of the single market in Europe will open the British market to foreign lotteries. In 1990, 3 million lottery tickets were seized by Customs & Excise officials. From next year, EC lotteries may be able to be sold in the British market, thus benefiting foreign rather than British sports and arts institutions.

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[22] These projects include the Olympic Events in Manchester (£800 million over 5 years), the International Sports Cities Project (£350 million over 5 years), a number of specialist facilities (totalling £86 million a year), national, regional and community facilities and a development and participation programme.

[23] National Lottery, Sports Council Briefing Note, January 1992.

- The net effect on employment of the introduction of a National Lottery will be positive. A National Lottery would need administrative staff; moreover, the funds going into sports, the arts and national heritage would create new job opportunities.

- The National Lottery would not constitute a form of regressive taxation more than any other voluntary expenditure or any other form of gambling.

3.5 The view of the National Council for Voluntary Organisations

The main aim of the National Council for Voluntary Organisations (NCVO) is to promote the interests and effectiveness of charities and other voluntary organisations. It has approximately 600 voluntary organisations in its membership in the UK. Its recent Discussion Paper[24], the NCVO's concerns are:

- that, according the Charities Aid Foundation research, the amount of public giving to charities between 1987 and 1990 has remained broadly the same;

- that the proposed lottery may affect donations to charity; NCVO quote research from the Republic of Ireland that shows that the introduction of a National Lottery has been detrimental to fund raising by several charities;

- that a lottery may have an adverse impact on local authority and central government spending on grants. The NCVO expects that local authorities will take the existence of a National Lottery into account when making spending decisions. Similarly, future expenditure on charities by central government is also likely to be affected by the National Lottery.

- that although the control and decision-making of how the National Lottery distributes its revenue remains open, power may be moved from the individual charities to the National Lottery. The mechanisms which decide how these new funds will be spent should be the subject of extensive consultation with the voluntary sector.

- that there are social and ethical arguments against a National Lottery. Excessive gambling creates disturbances for the gambler, his family, and society. The NCVO feels uneasy at the prospect of charities pressing for an extension of legalised gambling.

The NCVO's position is one of caution about the benefits of a National Lottery. Charities are likely to lose income from direct publig giving and from small lotteries. At the same time, the NCVO recognises that the potential proceeds from the lottery might be very beneficial for the industry and, at the time of writing, was carrying out a survey among its members.

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[24] NCVO Disussion Paper, *"A National Lottery Raising Money for Good Causes"*, NCVO, March 1992

4 An Overview of Gambling: Economics and Psychology

Gambling is a worldwide phenomenon. But people gamble in many different ways. In this section we explore the economic rationale behind gambling, leading to a classification and review of the main types of gambling.

We also comment on the psychology of gambling, an aspect that has caused some disquiet on the part of Governments and the churches. A number of studies have been undertaken on the likely figure of addicted gamblers. However, participating in a National Lottery would be considered a 'benign' form of gambling, in the sense that it lacks the qualities which make other types of gambling addictive, such as the ability to participate in a high frequency of games in a relatively short time period.

4.1 The economics of gambling

Traditional economic theory, which is based on the concept of 'utility maximisation' offers little insight into why people might choose to participate in games which are likely to leave them financially worse off. Newer theories tend to focus on the skills, or the social aspect, of gambling, and emphasise the motivations, other than financial, behind the desire to gamble, or to fall back on the concept of human irrationality.

The 1978 Royal Commission on Gambling[25] offered the following definition:

> "Gambling consists of an agreement between two parties with respect to an unascertained outcome that, depending on the outcome, there will be redistribution of advantage (usually, but not always, monetary) among those parties. This redistribution may be achieved directly (as in a game of poker) or through an agent (as in the case of football pools and lotteries). Essential conditions in this definition of gambling are that participation in the agreement is voluntary and that the agreement not only provides each of the parties of the gamble with the chance of gaining advantage but also involves him in the risk of loss".

This definition is a very general one and, if strictly interpreted, includes more activities than those described by the common sense concept of gambling.

In most activities, individuals behave as risk averse agents; they are prepared to pay insurance policy premiums to transfer particular risks to insurance companies. More generally, people are prepared to accept lower expected values for a particular event, if that means that they can be more certain about the outcome.

In gambling, the attitude of the individual towards risk is reversed, since most individuals are bound to make losses.

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[25] Royal Commission on Gambling, Final Report, Volume Two, page 449.

Attempts by economists to explain the participation in gambling, and to reconcile it with people's habits of taking out insurance policies, have not been very successful.

We can maintain the analysis within the framework of the expected utility maximisation approach, and assume that:

- gambling has a positive expected return for particularly skilled individuals;

or

- gambling has a positive utility in itself, either because people like the thrill of being drawn lucky, or because it offers people escape from a grim life, progress in the social structure, or more money.

There are some forms of gambling where skills matter more than in others. Certainly punters believe that they can predict the outcome of a horse race better than others. Poker is another gambling activity where skills are rewarded with a higher success rate.

Viewing the gambling activity as an event, possibly a social one, is probably an important motivation for several forms of gambling. On-course horse race betting is part of the fun of going to the races.

Beyond use of skill and enjoyment of the process, there is a clear dilemma regarding the rationality of the behaviour of individuals. The coexistence of markets for insurance and gambling may imply that individuals behave inconsistently.

A different approach recognises that irrationality is, in fact, often a force behind human behaviour. There is a wealth of evidence suggesting that, when faced with choices involving uncertainty, people behave in ways which violate some of the axioms of utility maximisation and, therefore, show some departure from rationality.

There is also evidence (as mentioned before) of a tendency for individuals to under-estimate the probability of a likely event to happen, while they over-estimate the chances of an unlikely event.

Appendix A contains a more complete discussion of all these economic explanations of gambling.

Equally important, and possibly more enlightening, are the explanations offered by psychologists for the motives for gambling, and the typical characteristics of gamblers.

4.2 The psychology of gambling

A question of particular interest relates to the existence of 'compulsive' gambling. Thomas Jefferson called the lottery "a wonderful thing: it lays taxation only on the willing"[26]. It is this statement which opponents of gambling have sought to refute, by claiming instead that gambling can become addictive to the point where it is likely to cause serious distress to individuals and to society. The concept that the proclivity for gambling could become excessive is an old one. Addiction to gambling is described by the early Romans and remains a continuing theme throughout European literature.

The question of what constitutes gambling in moderation and gambling in excess remains under discussion. Gambling has been described as one of the 'manias', and psychoanalytic writers have acknowledged that gambling, like sexual and other type of appetitive behaviour, could take on a compulsive form. As is the case with *alcoholism, compulsive* or excessive gambling may imply a number of characteristics on the part of the gambler.

Compulsion may entail a situation where some, or all, of the following may be true:

- concern on the part of the gambler and/or family about the amount of gambling;

- an overpowering urge to gamble;

- the subjective experience of an inability to control the amount once gambling has started;

- disturbances of economic, social and/or psychological functioning of the gambler and/or the family as a result of persistent gambling.

US researchers[27] have concluded that 0.7% of the people in their sample were 'compulsive gamblers' while another 2.3% were potentially so. Compared with the order of magnitude of gambling participation, these figures represent less than 10% of those who gamble. Also, according to Downes et al[28], there is no evidence to support the view that the majority of gamblers spend their money recklessly.

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[26] Brenner, R., *Gambling and Speculation; A Theory, a History, and a Future of Some Human Decisions*, Cambridge University Press, 1991.

[27] *Commission on the Review of National Policy Towards Gambling, Gambling in America*, Final Report, 1976.

[28] Downes D.M., Davies B.P., David M.E. and Stone P., *Gambling, Work and Leisure: A study across three areas*, London, Routledge and Kegan Paul, 1976.

Few estimates exist of the likely numbers of compulsive gamblers in the UK. One of the most comprehensive studies was carried out in 1976 by Cornish on behalf of the Home Office[29]. Estimates of the number of regular gamblers are presented in Table 2.

Table 2	Evidence on regular gamblers (1976)
Gamblers on football pools	2.0 million
Off-course bettors	1.3 million
On-course bettors	24,000
Bingo gamblers	1.0 million
Gaming club gamblers	77,000

Source: Cornish D.B., *Gambling: A Review of the Literature and its Implications for Policy and Research*, Home Office Research Study n. 42, 1978.

The main conclusions are reported in the 1978 Royal Commission on Gambling report as follows:

- the initial decision to gamble probably reflects a variety of more or less ephemeral personal, social and situational factors, rather than a single or simple urge to gamble;

- habitual gambling is not so much determined by some deep-seated motivation, as by a process of learning influenced by the environment in which gambling takes place, and by the structural characteristics of the chosen type of gambling.

The author of the study employed the argument that those gamblers particularly at risk were the ones engaging regularly in forms of gambling which involved the possibility of continuous betting, and those who had relatively little personal disposable income. He then estimated that just over one million gamblers were at risk from excessive off-course betting, and that just under one million were particularly at risk from excessive bingo gambling.

Cornish also researched betting shops in the Birmingham area, and estimated that there were 5.3 compulsive gamblers for each of about 15,000 betting shops in the county.

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[29] Cornish D.B., *Gambling: A Review of the Literature and its Implications for Policy and Research*, Home Office Research Study n. 42, 1978.

According to his definition, compulsive gamblers bet whenever there was an opportunity, stayed more than two hours in a betting shop and bet until the end of racing. Of this group, 56% spent most of their own money on betting and had betting debts, 75% regularly spent more than they intended, and 45% regularly lost all they had with them.

The number of individuals seeking help with Gamblers Anonymous each year is about 2,000; although the *actual* prevalence of the problem is assumed to be greater.

It is also difficult to assess the relationship between gambling and social problems.

A national survey in the US[30] found:

- a strong correlation between gambling and unsatisfactory marital situations;

- that the degree of dissatisfaction at work increased with heavy involvement in illegal gambling;

- that absenteeism and tardiness at work are more prevalent among bettors; and

- that bettors' consumption of alcohol is three times higher than that of non-bettors'.

The direction of causation in these relationships is not obvious, and an interpretation of the findings could lead either to the conclusion that gambling has negative social consequences, or that people under stress tend to gamble more.

While excessive gambling is clearly a problem which should be taken seriously, a lottery lacks many of the characteristics required for being addictive.

The *typical* case studies referred to in the literature mainly apply to much more dynamic types of gambling, such as fruit machines, one-armed-bandits, horse and greyhound racing, where there is a continuous interaction between the gambler and the gambling environment. From this point of view, the risk of addictive gambling with a form of lottery, such as lotto and numbers games, where draws are not likely to take place more than once or, at most, twice per week, seems small, unless gamblers choose to buy large numbers of tickets and are prepared to accept a period of extended waiting until the results are clear.

Such a risk may be increased where instant lotteries are concerned, although even in this case there is not the excitement of playing one game after another.

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[30] Dielman T.E., *Gambling - a social problem*, JSI, 1979.

4.3 An overview of the main types of gambling

A profile of regular gamblers is presented in the Royal Commission report. A breakdown by sex, age and occupation is presented in Table 3.

Table 3 Regular participation in gambling	
	Regular gamblers as a percentage of the adult population
Overall	39%
by sex:	
Males	54%
Females	27%
by age:	
18 - 24	29%
25 - 44	39%
45 - 64	46%
65 and over	34%
by occupation:	
Professional and managerial	35%
Other non-manual	39%
Skilled manual	57%
Semi and unskilled manual	52%
Full-time housewives	21%
Others	51%

Source: Rothschild Royal Commission on Gambling
The results are derived from a survey conducted in spring 1977.

Thus the majority of gamblers tend to be men; gamblers are typically between 45 and 64 years of age, and tend to carry out both skilled and unskilled manual jobs.

A wide range of gambling activities is available, and the participation rate varies considerably among them. Table 4 presents results from a recent survey[31] on participation rates.

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[31] Mintel, Special Report, Gambling, 1991

Table 4	Participation rate in different gambling activities in Great Britain (% of population)	
Football pools		37%
Lotteries/raffles		28%
Bingo		17%
Gambling machines in clubs and casinos		15%
Horse racing		13%
Spot the ball		9%
Card games for money		9%
Dog racing		4%
Gambling in a club or casino		3%

Source: Mintel, Special report, Gambling 1991
The results are derived from a survey conducted in February 1991 on a sample of 858 adults.

In the following, we draw a brief profile of different types of gambling activities and, where possible, provide some indication of the structure of participation. Our starting point is those types of gambling where a social dimension is a prominent, but not necessarily the only, motivation. Social gambling includes games like bingo and those played in casinos, even though the characteristic of this social aspect is different in the two cases. We then review games related to sports activities where the skill element may play, or may be perceived to play, a role. Finally, we review pure chance gambling, such as lotteries and lotto games.

Bingo

In general terms Bingo can almost be viewed as a community activity, sometimes played with a charitable intent. In most cases Bingo is played in clubs. Bingo is a game of pure chance. It does not require any entry-level knowledge and players' participation is relatively limited. It is also a game with low frequency of opportunities; usually a limited number of games are played in each session and sessions are held only a few times a week. Sizes of bets are limited and prizes are sometimes non-monetary.

Figure 1 shows the participation rate for Bingo in the UK according to sex and age, as well as by different socio-economic groups from the Mintel survey. In the UK, one person in six, on average, plays Bingo. Bingo is mostly a female activity, in that the participation rate for women (23%) is more than double that of men (10%). It also shows a relative constant patronage over the different age bands, except for the young adults (between 25 and 44 years of age).

Socially, Bingo is more popular in the D and E classes than in the A and B ones. Only 5% of people in classes A and B play Bingo while this rate rises to above 20% for classes C2, D and E.

Figure 1   Participation Structure for Bingo
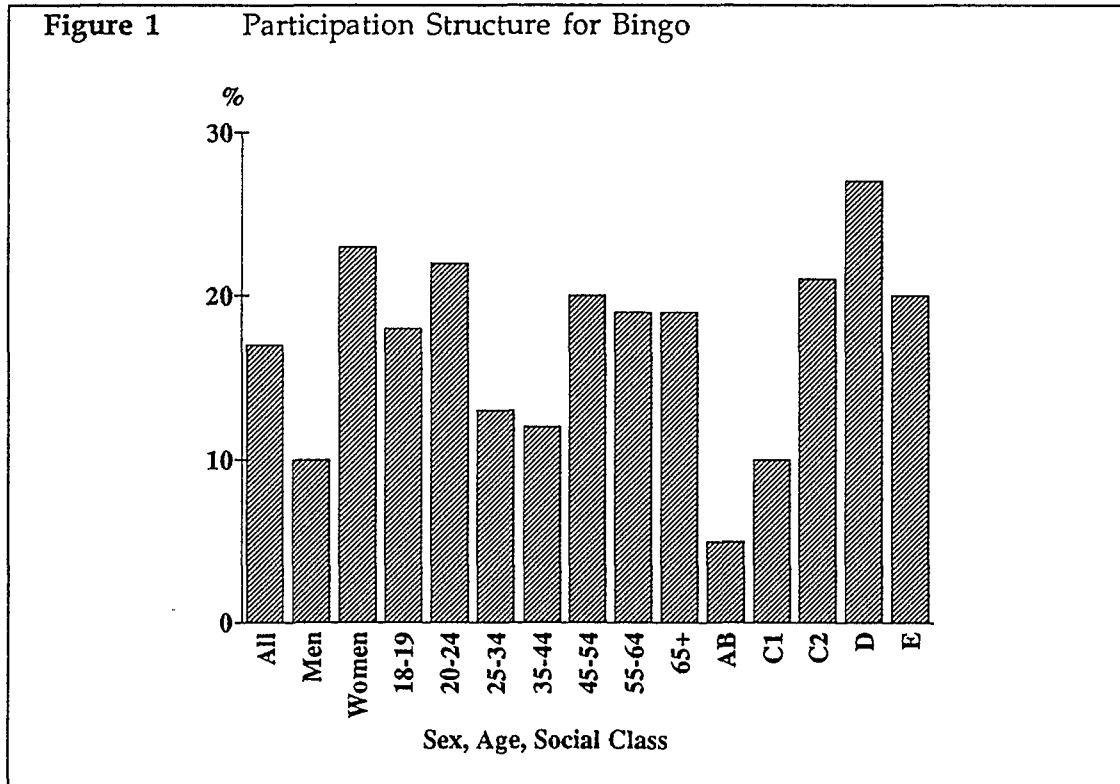
Casino gaming

The social element in casino gaming refers to the establishment and recognition of status. There is no data available on casino patronage, principally because the proportion of the population involved in such activity is very low (see Table 4 above). Casinos offer a greater variety of games than other form of commercial gambling. Some of them, like roulette, craps, big six wheels, and slot machines, are games of pure chance. At the other end of the spectrum lie games like tic-tac-toe, checkers, and chess, which are games of pure skill. Between the two groups are those games that, according to our categorisation, would be defined as pseudo-skilled, like blackjack, baccarat, poker, and backgammon.

There is no significant entry-level knowledge barrier in casino gambling (only for some games a minimum of knowledge of non-trivial rules is essential). Most casino games require some degree of participation, not necessarily skilled; and for many games it is limited to 'pulling the handle' of a machine, with the outcome governed by pure chance.

Casinos also offer a wide variety of frequency of opportunity to gamble, bet size and pay-out ratios. Pay-out intervals in slot machines, craps and blackjack are almost immediate; keno takes a more leisurely pace.

The continuous nature of gaming has two consequences:

- the odds are more favourable to players than in most other forms of gambling. However, the small 'edge' that casinos have over players operates each time a game is repeated and the many times this happens ensures that casino profits (players' losses) are large and, by the laws of probability, relatively certain;

- players have no time to reflect on their financial position between gambles.

The range of odds is also varied and variable, from the small-stake/low-odds slot machines to the highly variable odds and stakes of craps and blackjack. The implication of high frequency commercial gambling at variable odds and stakes are clear; this type of gambling is far more likely to extract un-affordable losses from undisciplined gamblers, than slow games with narrow ranges of odds and stakes, such as weekly and monthly lotteries.

For most players wins are reinforcing. Slot machines, and most table games, allow players to make bets where the probability of winning is relatively high, and these frequent wins are conducive to continuous gambling. In addition, individual gamblers have different views of the optimal relationship between the probability of wins and expected pay-out ratios, and the range of choices available at casino games is suitable to encourage patronage by a wide spectrum of the population.

Sport-related gambling

Even though some lotteries use sport events as their theme, in this section we consider those gambling activities where the outcome of a particular bet is determined primarily by the result of a sports contest. The main gambling activities in this group are horse race and greyhound betting and football pools betting. The ability of players to be able to forecast the outcome of such events may be perceived to improve their chance of winning. This is particularly the case in race betting, while the element of skill in football pools betting is quite limited. Player participation is an important feature of race betting, as it involves the selection of possible results with different (subjective and, in some sense, even objective) probabilities.

Technically, the entry-level knowledge required for these games is limited. However, players may feel the advantage of some form of expertise if understanding of the relevant game is important.

In the case of horse race and greyhound betting, where bets are accepted for each race and there are usually several races per fixture (and possibly more than one fixture per day) the frequency of opportunity to gamble is higher than for football pools, where games are usually held once a week. Variable odds are available.

In horse race and greyhound betting, and in football pools betting, a certain degree of skill and understanding of the underlying sport is perceived to be essential to gambling by a majority of players. The patronage of race betting and football pools betting is dependent, therefore, on the interest that racing and football matches are able to attract and, to a much lower extent than for other forms of gambling, on the monetary gains or the entertainment that gambling may deliver.

Figure 2 presents participation rates for football pools and horse race betting. Football pools attract more than a third of the population while horse race betting participation rate is only 13%. Both gambling activities are, however, much more popular among men than among women. Participation in football pools is highest in the C2 social class and in the 25 to 54 age range, while the pattern is less obvious in the case of horse race betting.

Figure 2   Participation Structure: Football Pools & Horse-race Betting
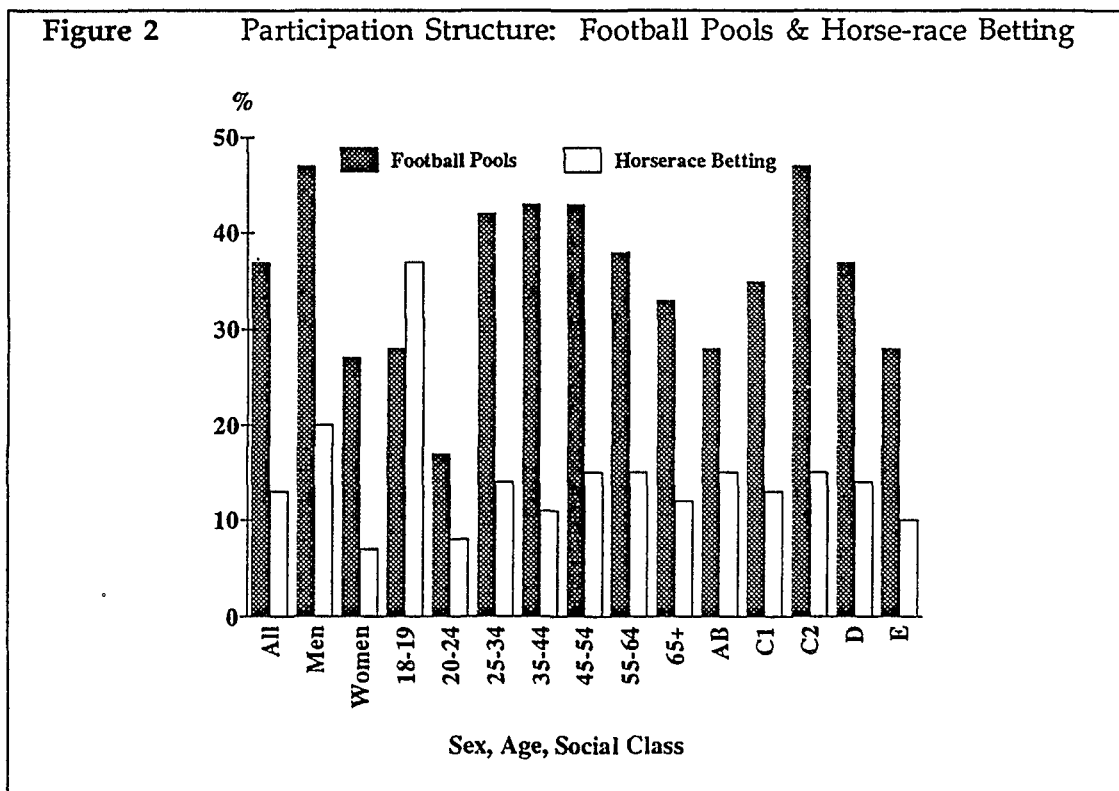
Lottery-type games

Lotteries are games in which chances to share in a distribution of prizes are determined by lot or by a draw. We can distinguish between a number of different games which can be seen as variants of lotteries[32]:

- ticket and class lotteries[33];

- instant lotteries;

- number games; and

- lotto.

All these games are games of pure chance and the social reward from participation is quite limited, except for the case in which revenues from the game are used for specific 'good' purposes.

A recurrent feature of lotteries has been the need to introduce new types of games at short intervals. This is a confirmation of the need to change the perception of the uncertainty associated with the game, to (artificially) create diversification in the product — which is the excitement of being drawn lucky — in order to attract and maintain patronage.

The degree of a player's participation in lottery-type games is, in general, very limited. It is non-existent in ticket and class lotteries, while it is confined to choosing a ticket or a set of numbers in instant lotteries and number games. Participation does not involve any skill, and the rules are usually trivial. The stake is usually small. Odds tend to be very long in lotteries, and may be fixed or variable, depending on whether or not wins are distributed on a pari-mutuel basis. Lotteries are generally characterised by low pay-out ratios. Generally only 40% to 70% of total sales are returned to players as prizes.

The frequency of opportunity to gamble is low, except for instant lotteries. Draws for ticket lotteries and number games take place, at most, once or twice a week. Class lotteries have an even lower frequency (a complete cycle may take anything up to six months). Only instant lotteries offer an opportunity of high frequency gaming.

Figure 3 shows the participation rate for lotteries in the UK. The overall participation is 28%, and there is little difference between men and women. Young adults participate more in lotteries than mature people. The participation rate in classes A and B (35%) is twice as high as in class E (18%).

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[32] The different types of lotteries are explained in more details in Section 5.

[33] The class lottery is a ticket lottery which takes place over a period of several months. Each lottery consists of several 'classes', which are sets of several draws. Tickets are purchased for one whole lottery and take part in all draws.

It is important to recognise that data presented in Figure 3 refer to participation in the small lotteries at present allowed in this country. There is no assurance that the same structure will characterise participation in a larger, National Lottery.

Figure 3   Participation Structure : Lotteries

Sex, Age, Social Class
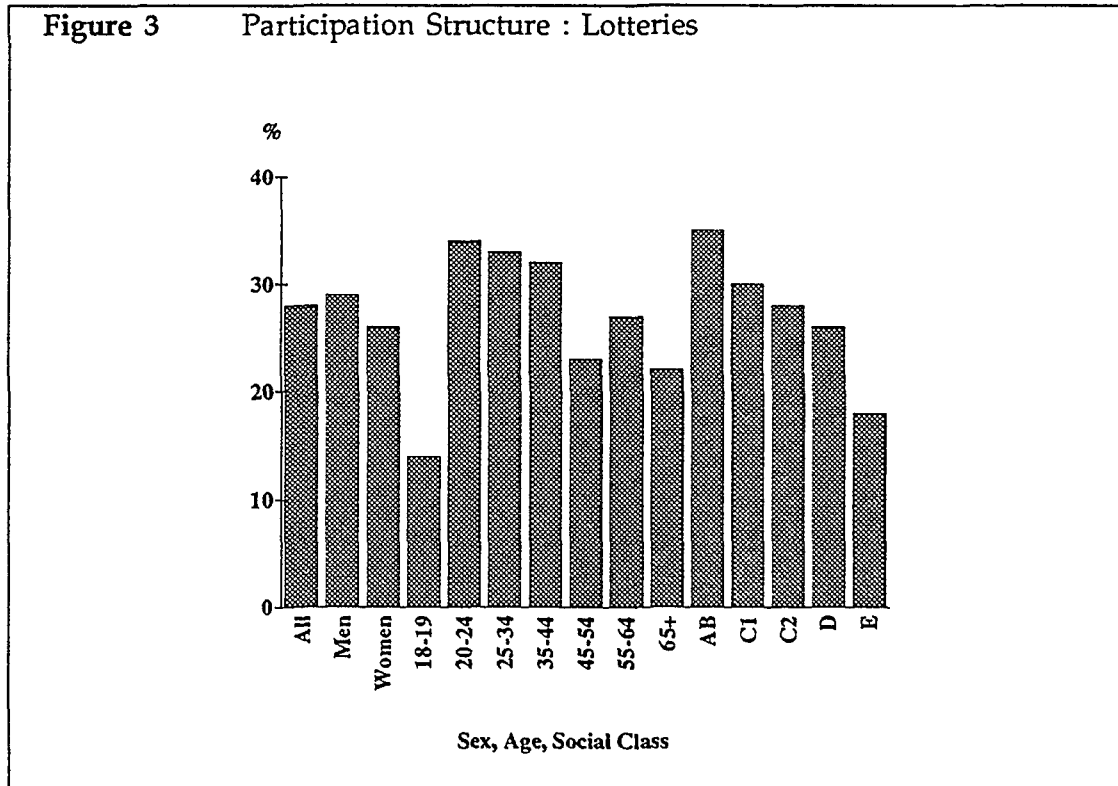
Financial market gambling

An economic description of gambling activities is not complete without some reference to speculation in the financial markets. Despite not being usually referred to as gambling in the same way as casino attendance, for example, the essence of speculation is very similar.

Taking a speculative position in financial markets satisfies the definition of gambling given above. Usually stakes are quite high, while odds vary according to the instrument and position chosen. In all cases, a high level of knowledge is required to enter into the game, and specialised institutions, not individuals, are usually the major players.

4.4 A classification of the main types of gambling

Based on our discussion of the economic and psychological aspects of gambling we may offer a classification of gambling activities by the following characteristics:

- The first is based on the amount of skill that the game requires, and the extent to which skill may be a relevant aspect in the outcome of the bet. In particular we can distinguish between:

  - games of pure skill (skill highly relevant for gambling result);
  - games of mixed chance and skill;
  - games of pure chance (outcome independent of players' skill).

- It is possible that players will aim to achieve a positive financial return when they see that their skill contributes to determining the outcome of the game. However, when only pure chance is involved, players would have other motivations for participating. In this case we can distinguish between:

  - games benefiting from a social aspect of participation;
  - games without a social aspect.

  In the first category are those games which are usually played in clubs, or other designated locations, or those where the participation enhances social interaction in any other way (or just satisfies the need to emulate other people's behaviour). In the second case, if pure chance governs the outcome, it is just the pleasure given by the possibility of large wins that encourages participation.

- The nature of the game can depend heavily on the frequency with which it is played, and the amount of money which is staked. Addictive behaviour is related to high frequency, where heavy losses are possible. The ease with which losses can be made also depends on the typical size of the stake. We can therefore distinguish between:

  - high frequency of gambling opportunity with variable stakes;
  - games played at regular intervals with small stakes.

Table 5 summarises the characteristics of the main types of gambling activities. The different types of gambling activity exhibit fundamentally different characteristics. These range from the varying degrees of skill required to play the game, to the types of odds that are available. It is clear that drawing conclusions about the likely success or failure of a National Lottery, based on existing forms of gambling, is not straightforward.

Table 5	Characteristics of main gambling activities						
	Degree of Skill	Entry Level	Player's Participation	Social Aspect	Frequency of Opportunity	Size of Stake	Odds/ Rate of Return
Bingo	pure chance	none	low	high	medium	small	short/ 95%
Casino gaming	variable	medium	medium to high	high	high	variable	short to medium 97.5%
Horse race/ greyhound betting	medium to high	medium	high	low	high	variable	short to medium 81-88%
Football pools	low	medium	high	low	low	small	long 30%
Lotteries	pure chance	none	low to medium	low	low	small	long < 50%
Financial market speculation	high	high	high	low	high	large	variable n.a.

5   An Overview of Lottery Operations

The Whole World Lottery Guide[34] estimates that worldwide lottery sales in 1990 exceeded £37.1 billion, of which £11.5 billion was in the USA. This large volume of sales has been attributed to the widespread adoption of scratch-off instant tickets and on-line computer networks. On-line systems allow lotteries to offer more products, hold games more frequently, and to introduce other conveniences for participants, such as combination entries and advance-play options. These systems also ease the administrative logistics of operating high-volume games, and reduce administration and overhead costs, allowing lotteries to improve prize returns and to stimulate sales.

5.1   An overview of lottery games

While the lottery industry offers a great variety of games, these fall into four main categories; lotto, instant lotteries, draw or passive games, and numbers games.

Lotto

Lotto is an active game where participants select numbers (in general between five and nine numbers) from the game's universe that can vary from 25 to 199 numbers. Prizes are awarded for six, five, four and, sometimes, fewer correct selections, with prize values generally, but not always, calculated on a pari-mutuel basis. Some lottos offer fixed prizes for the lowest prize category. Many lottos also feature the drawing of a supplementary, or bonus, number to provide intermediary prizes between the jackpot and the relatively small prizes awarded to those with fewer correct selections.

The major appeal of lottos is the huge jackpots they offer; these are increased by lengthening the odds towards them, or by weighting the size of prizes towards the jackpot. Jackpots are increased even further if they are carried over from one week to the next - an event which occurs if the winning number combination has not been chosen by any player.

Instant games

In these games the participants find out *instantly* whether or not they are winners. The traditional form of an instant game was a ticket folded several times and sealed to conceal the number. After tearing it open, the participant checks the number against a list of previously drawn winning numbers in order to determine which ticket is a winner.

The contemporary version of the instant ticket is one where prizes are pre-printed on tickets, but concealed by a thin, opaque film of latex plastic. Participants remove the coating to become instant losers or winners. The prize structure of these games is typically weighted toward lower-tier prizes, to encourage multiple plays and reinvestment of winnings. Some games do offer instant prizes as high as $50,000 or $100,000.

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[34]   P.R.Green, *The Whole World Lottery Guide*, 1991, World Media Brokers Publication.

Draw games

Draw games are based on matching the number printed on the lottery ticket to one of several winning numbers selected on the draw date. Tickets usually have numbers with five to seven digits. Grand prizes are awarded to those participants matching the winning numbers exactly, subsidiary prizes may be awarded to part matches, such as the first or last four digits, or to tickets falling within one or more digits of the winning number.

Numbers games

These games are played predominantly in the US. Games are either three or four digits, and are usually drawn daily. Participants select three- or four-digit combinations between zero and nine, and attempt to match the numbers drawn by the lottery. These games can be played in different ways: the basic distinction is between straight (exact-order) and box (any-order) wagers. Numbers games use one of two pay-off systems. With a fixed pay-off, the lottery pays a fixed prize for each type of wager, normally 50% of the true odds. The alternative is a pari-mutuel system for distributing prizes, where the size of the win depends on the number of correct entries.

New Games

In addition to these four standard types of lotteries, there are a number of new games which are currently attracting attention.

- **Spiel** is an overlay game usually offered as an optional, extra wager to lotto and toto participants. It is generally available only to those who have entered the required game. The entry procedure depends on whether the lottery is automated. If it is off-line, the participant indicates whether he wishes to play the number pre-printed on the entry coupon; if the lottery is on-line, the computer will generate a spiel number.

- **Keno** features a universe of up to 80 numbers from which perhaps 20 winning numbers are selected. Participants can select anywhere from 2-10 numbers. The grand prize is reserved for those forecasting 10 of the winning numbers. Those playing a lower tier game (2-6 selections) must usually be correct in all their selections to win, but consolation prizes are awarded to those playing higher-tier games with mostly correct forecasts. The game is comparatively complex to play and this has led to difficulties in marketing.

- **Video lottery** terminals are sometimes compared to slot machines, and games are usually based on keno or poker. This has been adopted only slowly because of its similarity to harder forms of gambling. Video lottery terminals tend to offer good prize returns of about 80-85%.

5.2 Changing lottery games

With the exception of lotto, lottery games of a particular design tend to have a fairly short product life. This is particularly true of instant lotteries. For instance, the Irish An Post National Lottery Company introduced five new instant games between March 1987 and March 1988, and another four new games over the same period the following year, in order to maintain customer interest and enthusiasm. In its Annual Report & Accounts the company states that it has tried hard to beat what it perceives to be a standard trend, that instant games decline in popularity as the novelty factor diminishes and as player participation in on-line games, such as lotto, increases.

Partly for this reason, most American lotteries offer at least two games, and an increasing number operate all four major lottery types. This serves the purpose of supplementing core games with innovative new products, designed to present existing players with new and alternative wagering opportunities. In addition, the introduction of new games serves to develop niche market segments with special appeal to particular customer groups. For instance, in the Irish National Lottery, instant games are a more down-market form of lotteries; the majority of prize values are concentrated in the under £500 range, while with lotto, more than half of the prizes in percentage value terms are worth more than £100,000.

5.3 The impact of technology on lottery sales

The large increase in volume of sales in the USA and elsewhere has been attributed to important technological innovations. Two types of technology in particular have shaped the progress of lotteries:

On-line computer networks

Lottos rely on huge on-line systems in order to record selected numbers via the agent's computer terminal to the central processing unit. This enables the lottery company to process vast quantities of tickets in a very short time. Computerised lottery networks are almost universal in the USA, they have been introduced in Ireland, and they may shortly be introduced on the European continent. Their advantages are:

- administrative savings, particularly in terms of accountancy time and costs;

- huge numbers of wagers can be processed within a restricted time permitting games to be held more frequently;

- an improved security system enables errors to be minimised;

- the payment of winnings almost immediately after the draw;

- special features to stimulate sales;

- the introduction of other conveniences for participants, such as combination entries and advance play options;

- greater flexibility to provide new games;

- the availability of the network for the provision of other services, such as information on sport facilities and events.

Scratch-off instant tickets

The introduction of plastic latex coverings for instant tickets has changed a traditional lottery product, the break-open instant ticket, and repackaged it in a form with tremendous consumer appeal.

The range of improvements include:

- improved coatings for greater security and increased player confidence;

- new printing systems, limiting the number of sequentially losing tickets;

- automatic dispensing machines in high traffic areas.

At the same time, this new form of packaging has permitted greater product segmentation, with specialised game themes, tiered pricing and multi-play tickets. The administrative problem of dealing with huge numbers of tickets has also been solved by bar-coding which allows on-line agents to validate instant tickets automatically.

5.4   Distribution of lotteries

The sale of lottery tickets, particularly in the USA, has progressed from the conventional sales outlets of the past.   A range of outlets is now available:

Retailers and newsagents, post-offices

This has been the standard channel of selling lottery tickets, and is now further encouraged with the help of advertising.   Lotteries are promoted in much the same way as any other mass consumer product, using:

- celebrity endorsements;
- special offers;
- cross-merchandising agreements;
- special attention to point of sale displays and messages which are important to a product where many purchases are impulse buys.

Other distribution channels

Other sales strategies are aimed at making tickets more readily available; these include:

- subscription programmes;
- advance play features;
- mail distribution of lottery tickets.

In addition, home betting has been introduced in HongKong, where players can place lotto wagers from home using a 'customer input terminal'.

5.5   The cost of operating a lottery

The recent experience in Ireland provides a useful indication of the likely costs of setting up and running a National Lottery in the UK. In the present context we are mainly interested in the cost of operating a lottery. The capital cost of setting up the operations of a lottery depends on the type of game chosen.

The National Lottery in Ireland was established in 1987 and it is still in a relatively early stage. It is possible, therefore, that the structure of costs does not reflect the typical situation of a 'mature' lottery.

Table 7 presents the breakdown of total turnover in prizes, various types of costs and the surplus to the National Lottery Fund (the 'good causes') for the last two years.

In 1991, operating costs totalled 16.3% of total turnover. A quarter of these costs refers to the leasing of on-line machines and related services, while the biggest share (6.34% of total turnover) is spent on agents' commissions and bonuses. Printing, marketing and distribution, and other administrative costs, account for around 3% of turnover each.

Table 7	Prize and cost structure of the Irish National Lottery (Turnover = 100)	
	1990	1991
Prizes	49.99	51.03
Gross surplus	50.01	48.97
allocated to:		
Agents' commissions and bonuses	6.34	6.34
Printing, marketing and distribution	3.45	3.06
On-line facility and services costs	5.00	4.07
Administration costs	3.21	2.82
National Lottery Fund ('Good causes')	32.00	32.68
Total operating costs = Turnover - Prizes - Good Causes	18.01	16.29

Source: An Post National Lottery Company, Annual Report, 1991.

As a percentage of turnover, payments to agents in Ireland are relatively low. Table 8 indicates the percentage of turnover spent on agents' commissions in those lotteries for which we have information. This implies an average commission of above 7%.

The Irish experience indicates that the incidence of costs decreases with the increase in lottery turnover, while prize returns and contributions to good causes increase. It is not likely that a mature lottery will need to devote more than 15% of turnover to costs, but these will account for a much larger share of revenue in the early years.

Table 8	Percentage of Ticket Price paid to Agents
Country	**Agent commission**
Austria	9.00%
Belgium	6.75% - 7.50%
Denmark	8.00%
Germany	7.00% - 10.00%
Finland	6.00-10.00%
France	5.00%
Iceland	5.00%
Netherlands	12.50%
Norway	8.00%
Portugal	7.00%
Rumania	7.60%
Sweden	5.00% - 6.10%
Switzerland	8.10%
Australia	4.76% - 10.00%
New Zealand	7.00%

Source: London Economics estimates

5.6 Lotteries in Europe

Outside the UK, lotteries have long been a popular means of gambling. Table 9 (on the following pages) summarises the most popular lotteries in the EC and Scandinavia. Of the total ECU 7.6 billion ((£10.6 billion) lottery sales summarised in the table, 83.3% come from lotto sales, 12.9%, come from sales of instant lotteries, and only 1.14% and 1.76% were generated from daily draws and passive lotteries, respectively.

The strength of lotto in European lottery sales is partly attributable to the expansion of on-line systems and the stimulus to per capita sales which they provide. Several countries (Austria, Denmark, The Netherlands and Germany) offer a class lottery where the draw is held in stages over a time-frame which can extend to six months. Europe is the prime focus for on-line systems suppliers; France, Ireland, Spain and Scandinavia have all installed networks recently.

Table 9   Main European Lotteries

Country	Game name	Market Share (%)	Pay-out to Winners (%)	Price ECU	Lottery revenues Lotto ECU Millions	Daily Numbers ECU Millions	Passive ECU Millions	Instant ECU Millions	Other ECU Millions	Total Sales ECU Millions	Sales/ Capita (ECU)	GDP/ Capita (ECU)
Austria	Lotto	54.30%	50.00%	0.42	385.6					385.6	49.36	
	Zahlenlotto	1.10%	40.00%	0.97	7.7					7.7	0.99	
Total		55.40%			393.4	0	0	0	0	393.3		
Average			49.80%	0.43							48.41	13,146
Belgium	Lotto	57.80%	50.00%	0.24	358.5					358.5	38.27	
	Joker	6.10%	50.00%	0.71			38.1			38.1	4.07	
	Presto	11.30%	61.00%	1.19				70.2		70.2	7.49	
	Subito	13.30%	61.00%	1.19				82.3		82.3	8.78	
	Baraka	11.40%	60.00%	2.38				70.6		70.6	7.54	
Total		99.90%			358.5	0	38.1	223.1	0	619.7		
Average			53.85%	0.75							25.26	13,415
Denmark	Lotto	59.30%	45.00%	0.25	205.0					205.0	39.99	16,436

Table 9 Main European Lotteries

Country	Game name	Market Share (%)	Pay-out to Winners (%)	Price ECU	Lottery revenues					Total Sales ECU Millions	Sales/ Capita (ECU)	GDP/ Capita (ECU)
					Lotto ECU Millions	Daily Numbers ECU Millions	Passive ECU Millions	Instant ECU Millions	Other ECU Millions			
Germany	Lotto-SA		50:00%	0.61	2,674.9							
	Lotto-MI	·	50.00%	0.49	575.2							
	Losbrief-Lot		40.00% -43.0%	0.49				105.6				
	Spiel 77-SA		43.33%	1.23			110.8					
	Spiel 77-MI		43.33%	1.23		·	12.1					
	Rubbellos-Lot		40.00% -41.00%	0.49				98.9				
	Gluecks-Spirale		37.00%	2.45					63.0			
Total					3,250.1	0	122.9	204.5	63.1	3,640.6	33.20	15,415
Average			49.06%	0.64								
Finland	Lotto	57.60%	45.00%	0.18	173.4					173.4	34.73	
	Assa	12.30%	45.00%	0.92				36.9		36.9	7.39	
	Casino	6.20%	45.00%	1.84				18.6		18.6	3.73	
	V5-Raviveik	5.70%	45.00%	0.05					17.3	17.3	3.46	
Total		81.80%			173.4	0	0	55.5	17.3	246.6		
Average			45.00%	0.41							26.09	7,146

Table 9   Main European Lotteries

Country	Game name	Market Share (%)	Pay-out to Winners (%)	Price ECU	Lottery revenues Lotto ECU Millions	Daily Numbers ECU Millions	Passive ECU Millions	Instant ECU Millions	Other ECU Millions	Total Sales ECU Millions	Sales/ Capita (ECU)	GDP/ Capita (ECU)
France	Loto M	32.00%	52.00%	0.14	979.5					979.5	17.31	
	Loto S	38.60%	52.00%	0.29	1,183.7					1,183.7	20.91	
	Tapis Vert	3.40%	59.30%	0.00		104.3				104.3	1.84	
	Tac O Tac	8.50%	55.00%	1.45				259.6		259.6	4.59	
	Instant	14.40%	60.00%	0.07				439.9		439.9	7.77	
Total		96.90%			2,163.2	104.3	0	699.5	0	2,967.1		
Average			53.71%	0.30							15.68	13,549
Netherlands	Lotto	80.90%	47.50%	0.44	54.1					54.1	3.68	12,747
Norway	Lotto	58.30%	50.00%	0.25	309.4					309.4	73.12	16,311
Portugal	Loto	56.00%	50.00%	0.07	145.8					145.8	14.15	1,213
Sweden	Lotto	39.30%	39.00%	0.27	316.0					316.0	36.78	
	Flax	2.70%	40.50%	1.35	21.4					21.4	2.49	
Total		42.00%			337.3	0	0	0	0	337.3		
Average			39.09%	0.34							34.61	15,525
Switzerland	Lotto	81.30%	50.00%	0.54	228.9					228.9	35.82	22,333

Other games are also gaining in prevalence. Spiel is popular in central and northern Europe (like Spiel 77 in Germany and Joker in Belgium). The expansion of these games, especially lotto, is thought to have dampened the growth in popularity of toto.

5.7   Lotteries in the United States

Lotteries were banned in the USA between 1894 and 1964. Growth in the number of lotteries, and in lottery sales, since 1980 is summarised in Table 10 below.

Table 10	Growth in US lotteries	
Year	Number of lotteries	Total sales ($ Billions)
1980	14	2.4
1985	19	9.0
1988	27	15.0
1989	33	20.2

Source: *The World Lottery Guide*, World Media Business, 1991.

This increase in lottery sales in the US is thought to have been boosted by a number of factors:

- aggressive marketing (including special offers, cross-merchandising, direct mail and point-of-sale displays) has had a large impact on sales of products where purchases are considered to be impulse buys, mainly instant lotteries;

- increased ticket availability, such as subscription programmes and advance play features, as well as the availability of tickets by mail;

- product innovation has meant that most lottery organisers have expanded and diversified the range of games offered to participants.   In North America, the major lotto games were introduced and then followed by niche games such as spiel, keno, all-cash lotto, and video lottery terminals;

- larger jackpots are considered to be the greatest stimulants to lottery sales, causing regular participants to increase wagers and attracting occasional participants.

The most striking feature of the US lottery product mix is the total absence of draw games and toto.   Toto has never been a feature of the US industry; this probably reflects the lack of enthusiasm for soccer.   The three major remaining games (instant, lotto and numbers games) are all extremely significant in terms of lottery sales revenues, as shown in Table 11.

Table 11	Sales revenues from lotteries USA (1989)	
	Total sales ($ Billions)	**% of sales**
Instant	5.25	25.9
Lotto	8.60	42.6
Numbers	5.90	29.2
Other	0.45	2.2
Total	20.2	100.0

Source: *The World Lottery Guide*, World Media Business, 1991

Of the $20.2 billion in annual lottery sales made by an estimated 160,000 lottery ticket vendors, approximately $10 billion (49.5%) is distributed in prize money, and $7.7 billion (38.1%) goes to governments (State and Federal) in the form of taxes, since the US tax system taxes lottery winnings as ordinary income. A notable feature of the US industry is the huge jackpot prizes offered by US lotteries. These are a consequence of high wagering levels, but also result from the policy of concentrating the prize money allocation on the first prize, and paying the jackpot as an annuity (which serves to inflate the real value of the prize).

Table 8 in Appendix B summarises the types of national/state lotteries available in 33 states in the USA. All states have an instant lottery and an annuity lotto; most of these states also have different types of numbers games, and some also have lotto with all-cash prizes. In many cases, the lottery industry has segmented its markets, and caters to the diversity of participant preferences by offering more than one lotto. This often takes the form of operating one 'blockbuster' game with very large jackpot potential, and another lower-tier game, sometimes drawn three or four times weekly. In addition, there are two multi-state games, encompassing 3 and 16 states respectively.

Tables 9 through 11 in Appendix B, summarise US lotteries in more detail by focusing on the three most popular types of games - those lottos involving annuity jackpots, cash lotto games and instant games.

Instant tickets are sold in all of the 33 states which have legal lotteries. The odds of winning any prize range from 1:3.6 to, at worst, 1:11, and the chance of a prize is, therefore, substantially higher than in lotto games.

In the US, lottery jackpots tend to be paid not as lump-sum prizes, but as annuities over periods from 11 to 16 years. This practice has been introduced to allow major jackpot winners to defer their tax burdens and because the cost of purchasing an annuity is much less than that of the cash jackpot.

The attraction of annuity lotto lies in the large jackpots that many of the US lottos regularly generate. In consequence, many lotteries have increased the universe of games to lengthen the odds of winning, and increase the probability of a jackpot carry-over. Another means of achieving a big jackpot is to weight the distribution of prize money in favour of the jackpot at the expense of lower tier prizes. Carry-overs from previous unclaimed jackpots have also become an important sales feature:

- many games offer two draws each week, often Wednesdays and Saturdays;

- market segmentation is also a growing feature of lotto with many states operating two games. The second game is increasingly a small universe lotto, often with all-cash prizes, intended to complement the lottery's main lotto.

The third largest category of games is all-cash lotto games. In terms of the likelihood of winning a prize, these games are situated somewhere between instant games and annuity lotto games; but maximum jackpots tend to be correspondingly lower than in the annuity case.

US Numbers games are played more frequently or even daily in some states. These games have only become popular in the Eastern and Central states of the US where they originated.

5.8 The Irish National Lottery

The Irish National Lottery was launched on 22nd March, 1987. It is operated by a state agency, the An Post National Lottery Company on behalf of the Minister for Finance for the purpose of generating money for good causes[35]. Table 16 outlines trends in sales, prize disbursements, and surplus. The table illustrates the popular success of the Irish National Lottery and, in particular, of Lotto. Lotto sales have increased from IR£21.1 million in 1988 to IR£155.4 million in 1991. The proportion of sales going to prizes has increased from 42% in 1987, to 51% in 1991.

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[35]   The good causes sponsored in 1991 include:

Youth, sport, recreation, amenities	IR£29.5m
Arts, culture, national heritage	IR£21.1m
Health and welware	IR£63.5m
Irish Language	IR£ 5.8m
Total	IR£88.4m

In the category of health and welfare, IR£4.988m were given to the Arts Council, IR£3,171m went to the National Cultural Institutions, IR£0.875m given to the National Botanic Gardens, and IR£2.245m went to Library Services.

Table 16 Overview of the Ireland National Lottery					
	1987	1988	1989	1990	1991
Sales IR£ millions	102.4	110.4	140.4	168.5	236.5
of which: Instant game	102.4	89.3	77.9	59.7	81.1
Lotto	-	21.1	62.5	108.8	155.4
Prizes IR£ millions	43.4	51.1	68.9	84.2	120.7
of which: Instant game	43.4	40.5	37.6	29.9	43.0
Lotto	-	10.6	31.3	54.3	77.7
Surplus IR£ millions	41.7	36.8	44.4	53.9	77.3

Source: An Post National Lottery Company

Since the inception of the Irish National Lottery, a large degree of product development has been undertaken. The decision to begin with an instant game was based on market research in Ireland and on the experience of state-run lotteries abroad. All these games have adhered to the same general format. A participant purchases a ticket for £1 and then scratches off the latex film on the play area of the ticket to reveal a number of panels. Depending on the contents of the revealed panels, the participant either wins nothing, wins a cash prize or wins an entry into the weekly Grand Prize game which offers a chance of prizes ranging from £5,000 to £25,000. To maintain customer interest and enthusiasm, new instant games have been introduced at regular intervals[36]. The introduction of Lotto in April 1988 appears to have been to the detriment of instant games. Two lotto plays cost £1.

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[36] The following new instant games were introduced between 1987 and 1989:

1987	Instant 3	March		
1988	Celebration Bonus	March	Windfall	May
	Cash Splash	June	Extra Chance	July
	2 Plus 2	October	Double Up	October
	Cash Drive	December		
1989	Whirl Win	January	Twice as Nice	April
	Top Score	May	Eureka	July
	Lucky Numbers	September	Joker's Delight	October
	Megadraw	November		

As in the US the prize structures of instant and lotto games in terms of the odds of winning a prize and the level of prizes in Ireland are designed to complement each other.

Table 17 presents the prize structure between instant games and lotto. Both the instant games and lotto generate a large number of modest prizes, but in the case of lotto the proportion of total prizes both in number and in value terms is lower than in the case of the instant games.

Table 17	Ireland National Lottery - Prize structure			
Prize range	% of Total Prizes Paid			
IR£	Instant		Lotto	
	No %	Value %	No %	Value %
< £501	99.98	79.56	99.37	30.52
£501 - £5,000	0.02	6.05	0.61	6.90
£5,001 - £100,000	-	11.73	0.01	4.88
> £ 100,000	-	2.66	0.01	57.70
	100	100	100	100

Source: *An Assessment of the Economic Impact of the National Lottery,* Davy Kelleher McCarthy Ltd., December 1989.

A profile of lottery participants and prize winners, published by the Irish National Lottery, suggests the expenditure patterns for adults as shown in Table 18.

Table 18	Amount spent on National Lottery in past two weeks (Adults only)		
Expenditure per fortnight	N.L.Instant	Lotto	National Lottery
Nil	62	55	42
IR£ 1	9	9	8
IR£ 2	17	20	18
IR£ 3	2	3	5
IR£ 4	5	8	13
IR£ 5	1	1	3
IR£ 6	2	2	4
IR£ 7	-	-	1
IR£ 8 or more	1	2	6
Mean per fortnight	IR£ 1.02	IR£ 1.20	£2.22

Source: *An Assessment of the Economic Impact of the National Lottery*, Davy Kelleher McCarthy Ltd., December 1989.

This and other information released by the An Post National Lottery Company suggests that:

- there is considerable overlap between expenditure on the instant lottery and lotto between each of these expenditure groups;

- the average expenditure level on the National Lottery is £1.11 per week per head of the population aged 18 and over, the average expenditure by participant is IR£ 1.92 per week;

- over half of the adult population (58%) participate in the National Lottery on a regular basis;

- the National Lottery participation rate of the unemployed is above that of the population in general and their average expenditure is, at £2.09, higher than any other labour force class.

6   The Taxation of Gambling

According to the Home Office White Paper: "the Government [...] believes that stakes in the National Lottery should be subject to a new lottery tax"[37].

In this section we will first discuss the economic rationale for a lottery tax. We will then look at the way in which gambling activities are currently taxed in this country.

6.1   The taxation of a lottery

Currently, personal donations to charitable institutions are virtually deductible expenses for income tax purposes[38]. The new National Lottery is introduced for the benefit of 'good causes'. However, not only will expenditure on lottery tickets not be tax deductible, but lottery stakes will be subject to a new lottery tax.

It is interesting to consider what justification economics can offer for the different treatment. It is quite clear that charitable donations and participation in a lottery, though organised to help good causes, are two different things.

Gambling is regarded as expenditure on entertainment. Buying a lottery ticket may be regarded as similar to the purchase of a cinema or theatre ticket. And, as any other form of expenditure, it may be subject to some form of taxation (such as value added tax).

However, gambling is generally regarded with contempt by society. But this may represent an opportunity more than a problem. We already tax other activities, like smoking and drinking, heavily. We do so not because their demand is insensitive to price; nor because of the health risks associated with them. The real reason is that people do not mind paying heavy taxes so much when that taxation is associated with activities which they perceive as mildly sinful. Like smoking and drinking, gambling at long odds is an activity which can be taxed heavily without raising resistance or resentment among people. A National Lottery would exploit that puritanical streak. And similar to the case of tobacco and alcohol, three main aspects are usually proposed:

- *addiction*: participation in gambling rests on an emotional involvement, which may lead to addiction with socially undesirable consequences.

- *externality*: participation in gambling may negatively affect the welfare of non-participants as well. While externality is more obvious in the case of tobacco (indirect smoking), the expansion of gambling may have an undesired effect on the social environment.

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[37] Home Office, *A National Lottery, Raising Money for Good Causes*, London, HMSO, 1992, p.7.

[38] The actual mechanism uses covenant schemes. The charity is able to claim back from the Inland Revenue the tax paid at the basic rate on the amount donated.

• *merit good*: individual participation in some activities, including gambling, may be prompted by a 'deviant' aspect of human behaviour, and society has a moral duty to limit its effects.

In all cases, as far as they are relevant for a National Lottery, there is justification for a high level of taxation which, by discouraging participation, will reduce the negative social effect of the introduction of a National Lottery.

Another justification may rest on the second-best nature of the tax system. If participation in a lottery increases the individual's chances of having to resort to publicly-funded services, the individual should be made to pay for such increased use of public money. This may be relevant if, for example, the running of a lottery has to be subject to strict policing, or if there is the danger that addiction will lead to poverty and to increased reliance on social benefit payments.

6.2   Taxation of gambling in the UK

Virtually all forms of gambling are currently subject to some form of taxation in the UK. The only exceptions are on-track betting which, subject to strict provisions, is not subject to the betting duty and small lotteries which are exempt from any taxation.

Table 19 presents the statutory tax rates for the main forms of gambling in the UK, together with tax revenues, estimates of turnover and the computed actual tax rate (the ratio of tax revenues and turnover).

Table 19 Taxation of gambling in the UK				
Activity	**Statutory Rate**	**Tax Revenue Estimate (1989-90) £M**	**Turnover (1989-90) £M**	**Actual Duty Ratio (1989-90)**
Off-track betting	7.7%	459	5,724	8.0%
Football pools	37.5%[2]	303	714	42.4%
Casino gaming	2.5% to 33.3%[3]	60	1,505	4.0%
Bingo	10%[4]	66	668	9.9%

1   Prior to the 1992 Budget, the duty rate on off-track betting was 8%.
2   Plus 2.5% contribution to the Football Trust and the Sports and Arts Foundation, respectively. Prior to 1990, the duty rate was 42.5%.
3   Progressive rate based on casino winning.
4   The prize monies added by the bingo operator are taxed at 11.1%

Source: HM Customs and Excise, Report 1989-90

It is clear that tax rates vary widely between the different forms of gambling. For our purposes, the most important difference is between the 37.5% duty tax rate on football pools, and the 7.75% rate on off-course bookmaking.

7 The Introduction of a National Lottery

In the previous sections we have surveyed the experience from other countries, and analysed various aspects of gambling in general, and lotteries in particular. In this section, we look at some aspects related to the introduction of a National Lottery in the UK. In particular, we consider the revenue potential of a National Lottery, taking into account the potential effects on other forms of gambling, the amount of funds that the lottery is likely to raise for good causes and the effect on tax revenues.

7.1 Revenue potential

When considering the suitability of a National Lottery to raise money for specific purposes, two issues can be distinguished. Firstly, how much money will a National Lottery be able to raise, and to what extent will it affect other gambling activities. Secondly, to what extent will the use of revenues to fund good causes affect the participation rate in the lottery.

The answer to both of these issues is quite complex. Comparisons cannot easily be drawn between different forms of gambling. Experience from other countries can only be used with great caution[39].

Two recent reports by Saatchi and Saatchi have investigated attitudes towards the introduction of a National Lottery[40]. Surveys of this kind are useful, but the results should be interpreted with care; responses of interviewees may differ from their actual behaviour, especially where expenditure decisions are concerned.

There has been a wide range of estimates of the likely amount of funds which a lottery will be able to raise. Currently, participants of small lotteries spend less than £2 a year in tickets. The Saatchi and Saatchi survey estimated a weekly expenditure in lottery tickets, by people who declared interest in the activity, of £1.69. The same survey suggests a 40% rate of participation. Using these figures, we would calculate the approximate turnover at £1.6 billion. Figure 4 presents the participatory structure as derived from the second survey[41].

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[39] The only other country where a national lottery has been recently introduced is the Republic of Ireland. In addition, other potential substitutes for a lottery, such as football pools, do not exist in many European countries.

[40] Saatchi and Saatchi, *Assessing the potential appeal of a National Lottery in the UK*, prepared for The Sports Council and the Arts Council, 2 August 1992 and Saatchi and Saatchi, *Further Assessment of the Potential Appeal of a National Lottery in the UK*, prepared for the Sports Council, 28 January 1992.

[41] There is some evidence that, according to the second survey, increased discussion on the proposed introduction of a national lottery in this country has increased people's stated preference in participating in the game.

Figure 4   Participation Structure for a National Lottery

Sex, Age and Social Class
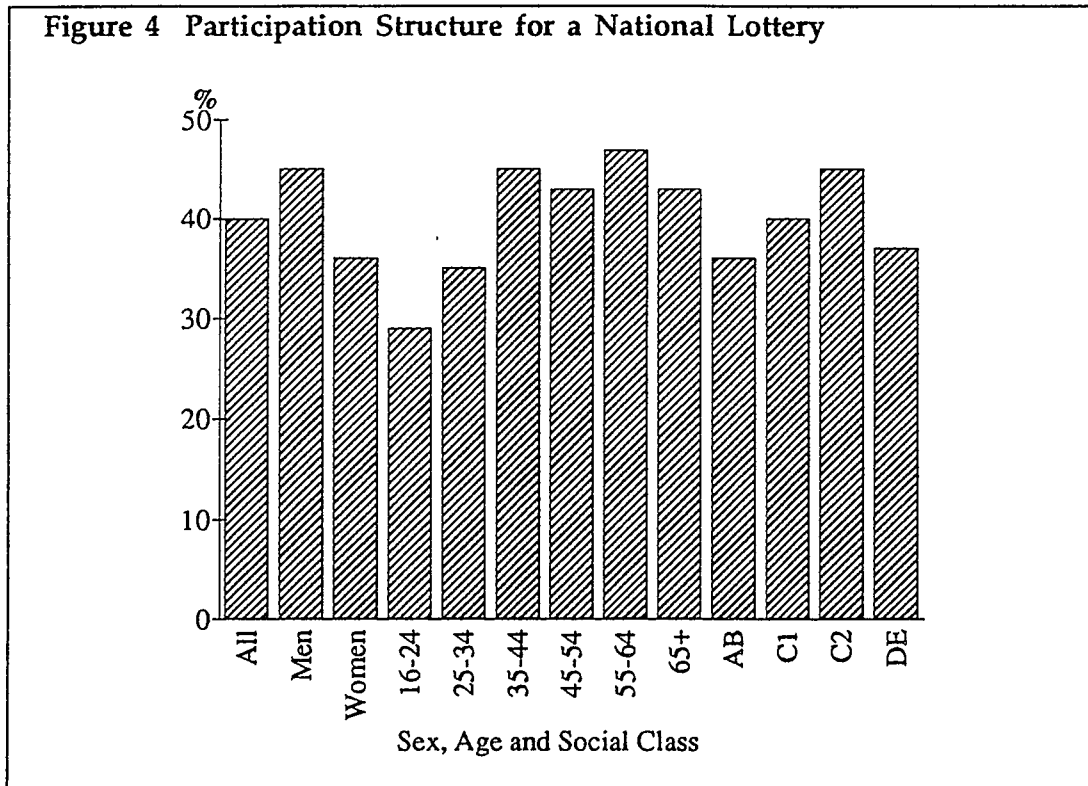
This structure is consistent with the results of surveys on existing lotteries in other countries. The general finding is that poorer people spend a larger proportion of their income on lotteries[42]. However, the results contrast quite sharply with those presented in Figure 3 in Section 4 for small lotteries.

The participation structure for a National Lottery, as suggested by the Saatchi and Saatchi survey, is closer to that of horse race betting or football pool gambling, than to that of existing lotteries.

Given the apparent similarity in participatory structure with other forms of betting, how much patronage of a new National Lottery will come from increased gambling, and how much will be substitution of one form of gambling for another. How much a new lottery will increase the overall 'consumption' of gambling by individuals could be equated to the impact of a new brand on the overall consumption of any good. The degree of substitution is governed by how the public sees different types of gambling as substitutes.

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[42] This is the conclusion reached, among others, by Rosen and Norton for New Hamshire; by Brinner and Coltfelter for Connecticut, Massachussetts and Pennsylvania; by Clotfelter for Maryland; by Lemelin for Quebec; by McLoughlin for Ontario; by Newman for Britain and by Tec for Sweden. (See Bibliography).

As shown in the brief description presented in Section 4, different gambling activities are characterised by different features. The degree of substitutability, therefore, will depend on preferences on aspects like odds, the frequency of participation, the amount at stake, the social content, and so on. The introduction of a National Lottery is likely to affect activities which present similar characteristics: long odds, infrequent availability, and no specific knowledge or player participation. Substitution from other forms of gambling could be greater for other types of lottery, football pools, than for other non-social games and social-related gambling.

Evidence from other EC countries suggests that there is some degree of substitutability between lotteries and lotto, on the one hand, and sport-related betting activities, on the other. Looking at per capita expenditure in different types of games, the correlation coefficient between lottery-type games and horse race betting is -0.28, while it is -0.49 in the case of football pools (toto)[43].

A number of studies have indicated that the main reason for participation in a lottery is the potential for winning large prizes. Rubner[44], for example, after examining a number of lotteries in several countries, concluded that "it is mainly the size of the top prize that determines their success". If the long-odds are the main attraction of a lottery, then players may not consider it as a perfect substitute for other forms of gambling with a different pay-out structure.

The Saatchi and Saatchi surveys suggest a low degree of substitutability between different forms of gambling. A National Lottery will attract a higher-than-average patronage by people already involved in other gambling activities (between 51% and 58%, against an overall average of 40%).

When gamblers were asked if they would buy the lottery ticket as well as or instead of their existing gambling expenditures, more than half of them said that they would continue with their existing gambling habits, and only 4% to 6% would substitute the lottery ticket for their usual betting. Furthermore, 53% of those interviewed for the second survey, agreed that a National Lottery would increase their total expenditure on gambling.

Another issue relates to the extra patronage that a lottery may attract if revenues from the lotteries are devoted to good causes, like the arts, sports and heritage. Again, there is no hard evidence on this issue, but it appears likely that patronage of a lottery would depend on the cause for which funds are raised.

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[43] The correlation coefficient is a statistical measure of co-variation between two variables. It varies between -1 and 1. When the coefficient is -1, the two variables vary together, but in opposite direction. A coefficient equal to 1 indicates perfect co-variation in the same direction. A null value suggests that no systematic pattern between the two variables exists.

[44] Rubner A., *The Economics of Gambling*, London, Macmillan.

The survey by Saatchi and Saatchi found that, when people in favour of a National Lottery were asked about the reason behind the potential purchase of a ticket, 87% mentioned the good cause as a motivation[45].

In the case of a lottery with revenues specifically devoted to good causes (Sports, Arts and the Environment) the overall participation rate increases from 40% to 50%. This would increase the estimate of total annual turnover to £2 billion. Figure 5 presents the participation structure of a lottery for 'good causes'.

Figure 5   Participation Structure for a National Lottery for Good Causes
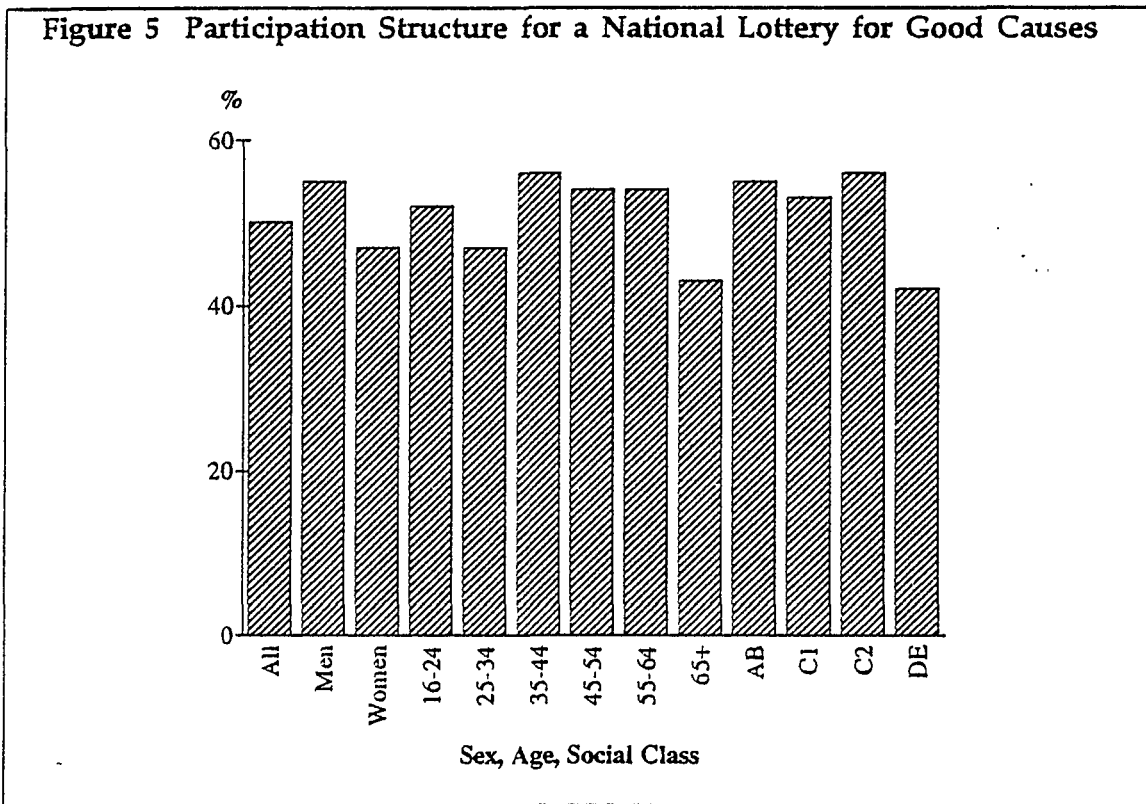
Figure 6 presents the 'good cause premium' (the difference between patronage for a lottery to help specified good causes, and a general National Lottery). The premium decreases with age, and is higher in social classes A and B. This pattern is similar to that for participation in existing, mainly charitable, small lotteries in this country. Thus, the introduction of a good cause element is likely to induce a greater increase in the number of 16-24 year olds, as well as the AB social groups, participating in the National Lottery; but participation across all categories will be increased.

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[45] The complete results are as follows:

Good causes	87%
Chance of winning big prize	74%
Like the idea as such	73%
Emulation of habits in other countries	68%
General attitude towards gambling	25%

Figure 6   Increase in Participation in a National Lottery for Good Causes

Sex, Age, Social Class
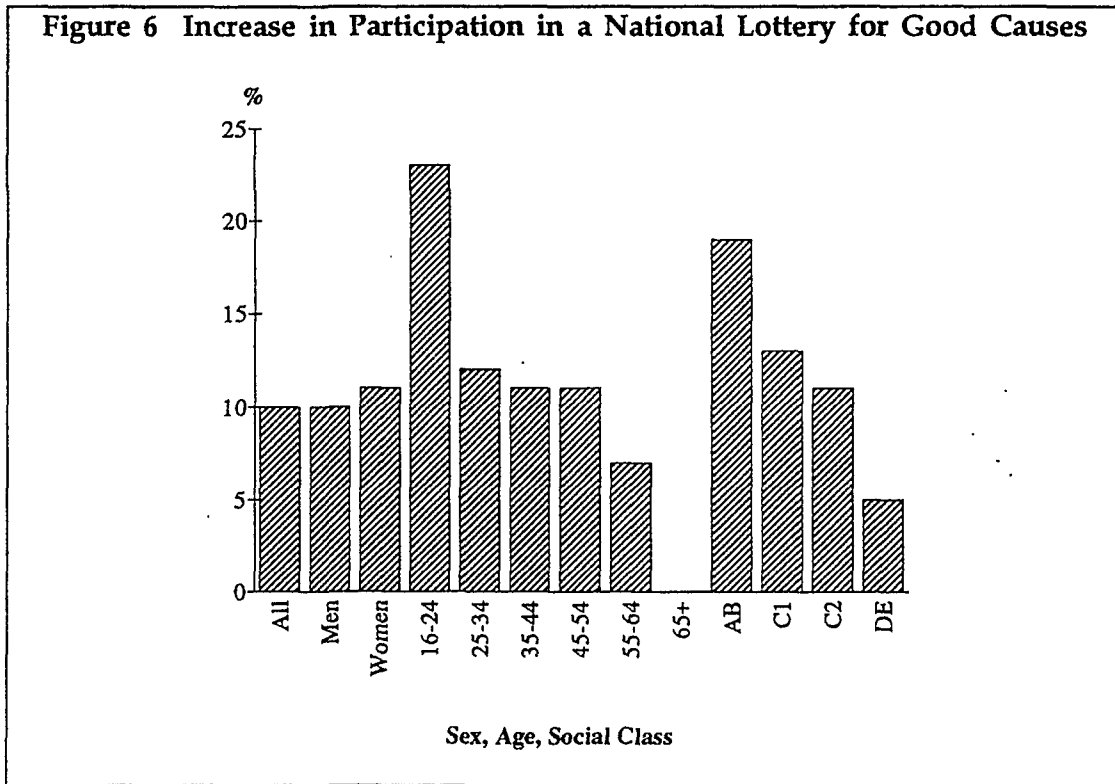
It is probable that players are not able to assess the odds or the expected win from their bets[46]. However, as noted above, monetary reward is not always the only reason for gambling, and an erroneous assessment of the terms of the game does not necessary affect an individual's choices. Furthermore, expected returns are not necessarily the basis upon which monetary considerations enter into the assessment of gambling opportunities.

A 1990 Canadian study on lotteries recognised that "if people want either to become richer or to restore their wealth after losing a significant part of it, games of chance giving away small prizes will not be perceived as attractive, but others giving away large prizes will", irrespective of the expected value of prizes[47].

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[46] A constant feature of individual behaviour under uncertainty is that people tend to overestimate the probability of unlikely event and to underestimate the probability of most frequent ones.

[47] Brenner R. with Brenner G., *Gambling and Speculation, A Theory, a History and a Future of Some Human Decisions*, Cambridge University Press, 1991.

7.2 The determinants of expenditure on lotteries

The design of a new lottery needs to identify the main determinants of its success. This is useful information in deciding the type of lottery and the characteristics of its structure.

To address this issue we have used the information shown in Table 9 (Section 5) to analyse statistically the level of lottery turnover. A full description of the methodology, and discussion of the results, is contained in Appendix C. Here we summarise our conclusions.

The success of a lottery (measured by per capita expenditure on it) is mainly affected by per capita income and the pay-out ratio of the lottery, a measure of the implicit price.
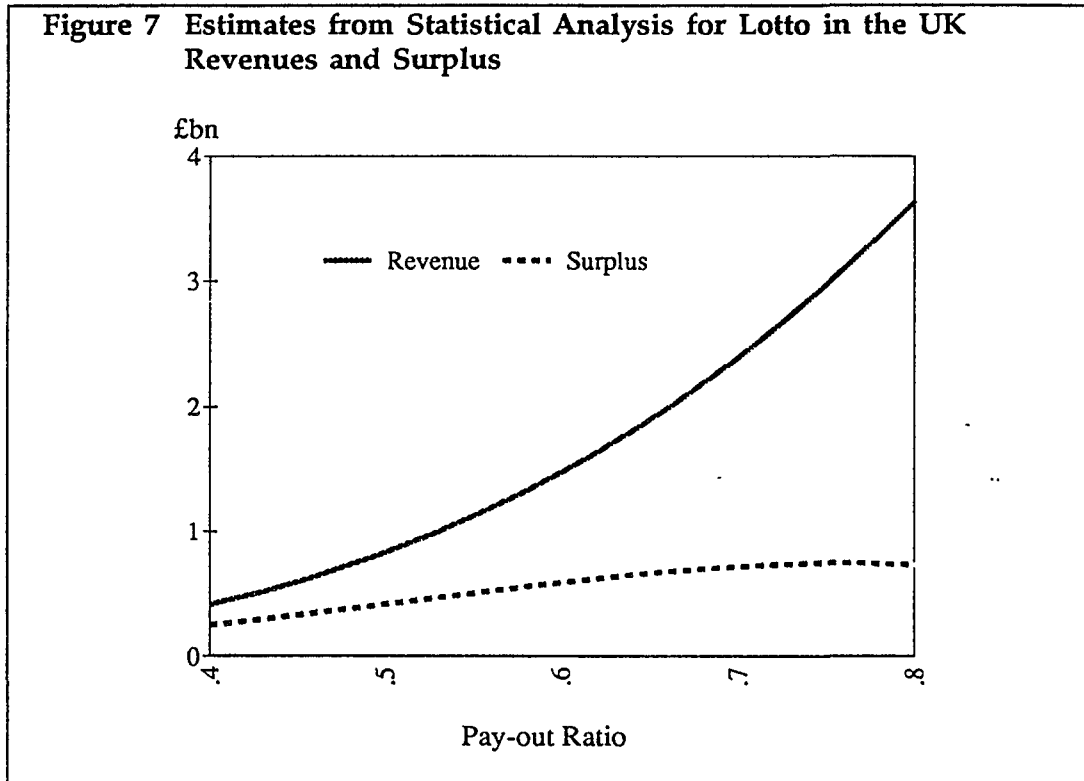
Lotto games and instant lotteries, in that order, attract the highest level of per capita expenditure on average. The proportion of total expenditure devoted to buying lottery tickets is higher in those countries where per capita income is higher. This effect is stronger in the case of lotto games than for instant lotteries.

Lotteries with higher pay-out ratios also enjoy a higher level of sales. A 1% increase in the ratio, say from 50% to 51%, could be expected to increase per capita sales by more than 6% in the case of lotto games, but by less than 1% in the case of instant lotteries.

Using these results, it is possible to estimate the optimal pay-out ratio for various types of lotteries. Optimality is defined, in this case, as that ratio which yields the largest surplus (revenues from sales minus prizes) to cover costs, taxation, and distribution to good causes. The optimal pay-out ratio is around 75% for lotto games, and 22% for instant lotteries.

This analysis can be applied to the United Kingdom data to assess the likely turnover that a lottery will be able to generate. We distinguish between lotto and instant lotteries. Results for the revenues and surplus for lotto are presented in Figure 7. We have found that the optimal pay-out for this type of game is around 70%; we do not think however that a lottery in this country should be structured in such a way that it returns more than 50% in prizes. In fact, in order for the new lottery to compete on equal terms with the existing forms of gambling that it is most likely to substitute (football pools imprimis), it should face an overall retention rate (taxation plus contribution to good causes) which is at least as large as that on these alternative forms of gambling.

Currently, this is 42.5% for football pools (40% of taxation plus 2.5% distributed to the Football Trust) and, once costs are included, the maximum share of turnover available for prizes will be around 50%. Such a pay-out ratio will, according to our analysis, generate revenues of around £0.9 billion. An instant lottery, with the same pay-out ratio, will add £0.4 billion to this figure. The total turnover from the introduction of the two types of lottery will therefore be around £1.3 billion.

Figure 7 Estimates from Statistical Analysis for Lotto in the UK
Revenues and Surplus

£bn

Pay-out Ratio

7.3   The taxation of a National Lottery

Section 6 showed that there may be some economic or social rationale for taxing stakes in a lottery. However, given the nature and characteristics of the proposed National Lottery, the "addiction, externality and merit good" aspects seem to be less relevant than in the case of alcoholic beverages and tobacco. The main reason for taxation is the maintenance of the level of tax revenues.

In order to assess the rate of tax necessary to achieve this aim, it is necessary to consider the degree of substitutability between the different types of gambling activities, and the tax rate to which these other activities are subjected.

Earlier, evidence was given which suggested that substitution between existing forms of gambling and the new lottery is quite limited. This evidence is based on interviews and we believe that it underestimates the likely degree of substitutability.

Our estimate is that, as a consequence of the introduction of the National Lottery, horse race and greyhound betting and football pools betting will be respectively reduced by around 10% and 25% of the expenditure in the new lottery. A further 35% will come from a reduction in other forms of consumption and the remaining 30% from the displacement of savings.

Table 20 presents the structure of substitution and the relevant tax rates. It is assumed that general consumption is subject to a reduced VAT rate since only part (around 50%) of it is subject to the tax.

Table 20 The effect of the introduction of a National Lottery on tax revenues				
Activity	Degree of Substitution	Relevant Tax	Tax rate	Reduction in tax for a £1 stake in the National Lottery
Horse race/greyhound betting	10/100	Betting Duty	7.7%	0.77p
Football pools	25/100	Betting Duty	37.5%	9.38p
General consumption	35/100	Value Added Tax	8.75%	3.06p
Savings	30/100			
Total reduction in tax revenues from £1 stake in the National Lottery				13.21p

Source: London Economics estimates

According to the above estimates, the tax rate which would leave tax revenues unchanged, if applied to lottery stakes, is 13.21%.

7.4 The amount of funding for a good cause

Turning to the allocation of funds, experience with lotteries has shown that the support for lotteries may be cyclical, and participation sometimes has needed the extra boost of an innovation in the form of the game to maintain its level. Funding derived from lotteries, therefore, might show some variability, and it may be more appropriate to devote it to ad hoc projects, involving large lump-sum capital expenditure rather than on-going expenditure to cover running costs.

Connected to this point, is the effect on other forms of funding when there is an allocation of proceeds from a National Lottery. While there is some evidence that direct donations from the general public to charitable institutions will not suffer in any substantial way[48], some substitution from charitable lotteries and public sector general funding may occur.

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[48] The Saatchi and Saatchi survey reports that only about one third of respondent thinks that a national lottery will divert money that people may give to charities.

We have already seen that the likely participation structure of a National Lottery in the UK is different from the current patronage of existing small lotteries. This suggests a small effect on funds available from these lotteries. On the other hand, experience in other countries, especially in Ireland, suggests that small lotteries have suffered from the introduction of a National Lottery. A potential compromise, to benefit charitable institutions against the effects of the introduction of a National Lottery, might be related to the use of part of the revenues from a lottery tax imposed at a slightly higher rate (15%) for granting general relief to charities (e.g. on VAT).

Public sector funding may also decrease as a consequence of the introduction of a National Lottery. In this case the result would be equivalent to a situation in which the proceeds from the lottery are included in the public sector general revenues[49]. This would represent a substitution of voluntary contributions for forced taxation. To the extent that the share of expenditure devoted to gambling and, in particular, the purchase of lottery tickets, decreases with income, this shift will move the tax structure towards a more regressive one.

Finally, it may be interesting to see who will benefit from increased funding of sports and the arts. Figures 8 and 9 present sport participation and art patronage, by socio-economic class. A and B classes have higher attendance rates for both kind of activities. This result can be read in two ways. These classes will benefit more than proportionately from any pound spent on sports and arts. However, there is obvious scope for increasing penetration of sports and the arts among D and E classes.

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[49] "The Government does not intend that the money provided from the [national] lottery should substitute for that provided in other ways: the proceeds will not be brought within the planning total, and the Government will not make any case by case reduction in conventional expenditure programmes to take account of awards from the lottery proceeds" (Home Office, *A National Lottery: Raising Money for Good Causes*, March 1992, para 41). In denying any reduction of general funding, the importance of the qualification "case by case" remains to be assessed.

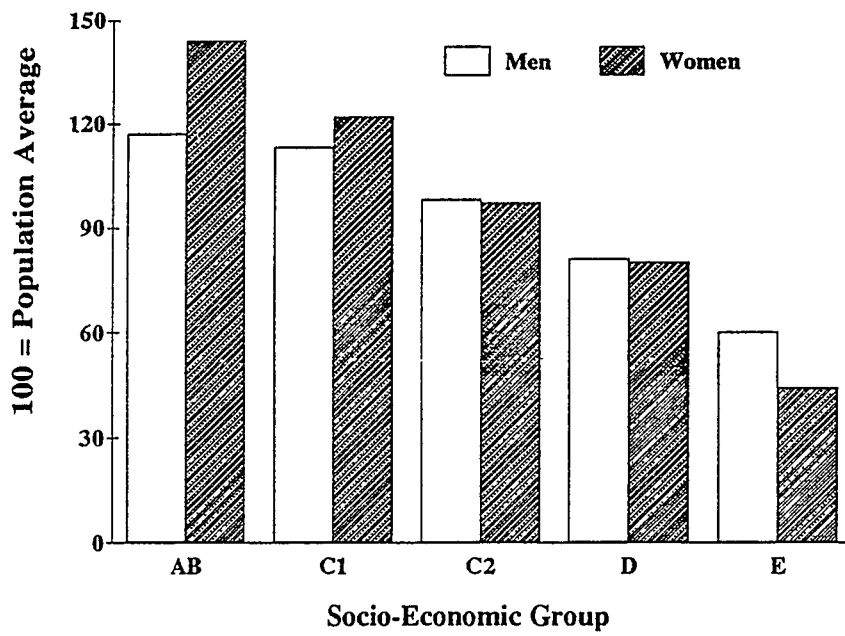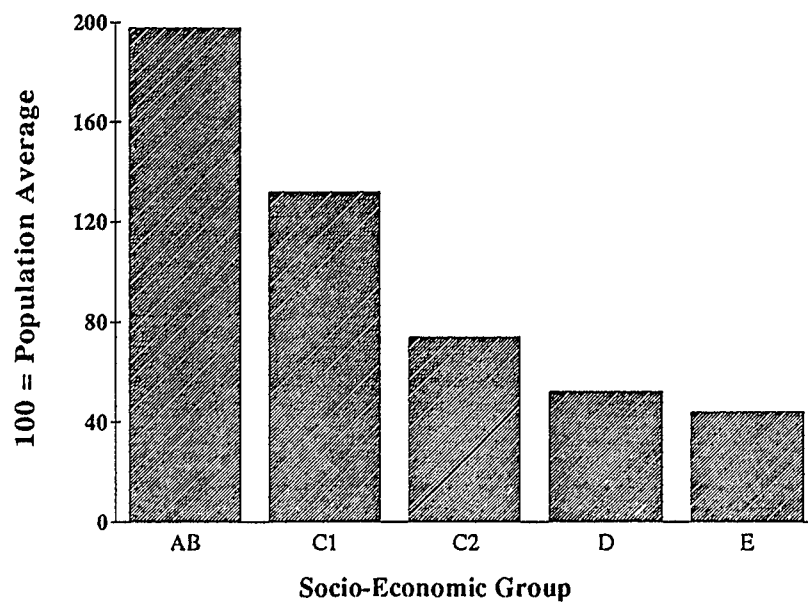Figure 8 Participation in Sport, by Socio-Economic Class

Figure 9 Patronage of the Arts, by Socio-Economic Class

8 Conclusion

The National Lottery will almost certainly be run by a private operator, acting under a licensing agreement. The contractual relationship will specify the maximum proportion of revenues that can be used to cover the costs of operating the lottery. It will also impose lower limits on the share of sales to be devoted to the funding of 'good causes' and will contain details of the tax regime to which the new lottery will be subject.

It is likely that the choice of the types of games to be offered will be left to the contractors. Our analysis suggests that a lotto game is likely to attract a higher level of turnover than other types of lottery. The desire to satisfy different preferences amongst the potential gamblers may suggest the introduction of an instant lottery alongside the lotto, as in the case of the Irish lottery.

The Saatchi and Saatchi survey indicates a potential turnover between £1.6 billion and £2.0 billion. No mention is made of the types of game to be introduced or of the pay-out ratio that characterises the proposed National Lottery. We believe that this figure, resulting from interviewees' responses, overestimates the turnover that a lottery is likely to generate.

The pay-out ratio of the new lottery should not be so high that the implicit taxation on the new lottery (lottery tax plus contribution to good causes) is lower that in the case of football pools (the most heavily taxed gambling alternative and closest substitute).

We suggest, therefore, that the pay-out ratio for the new National Lottery should be set at 50%. Our statistical analysis, when applied to the United Kingdom, indicates that the combination of a lotto game and an instant lottery, both with 50% pay-out ratios, will probably raise £1.3 billion per annum in revenues.

The lottery tax rate necessary to maintain tax revenues constant will be 15%. This rate will also allow for the funding of some relief measure for charities adversely affected by the new National Lottery. Costs will probably account for around 10%. The remaining 25% (or approximately £325 million) will be devoted to good causes.

Table 21 presents a summary of the proposed scheme. Table 22 describes the likely substitution effects on football pools and horse race betting. Football pools' turnover is likely to be almost halved by the introduction of the National Lottery.

Table 21	The characteristics of a new National Lottery	
	% of annual turnover	£m
Expected annual turnover		1,300
Prize return	50%	650
Costs	10%	130
Gross surplus	40%	520
Tax revenues	15%	195
Net surplus to good causes	25%	325

Source: London Economics estimates

Table 22	The likely effect of the introduction of a National Lottery on the turnover of other forms of gambling			
	Current turnover	Loss due to the National Lottery		Expected turnover
	£m	£m	% of current turnover	£m
Football pools	750	325	43.3%	425
Horse race/greyhound betting	6,525	130	2.0%	6,395

Source: London Economics estimates

Appendix A:

On the Economics of Gambling

The economic interpretation of gambling

Economists are interested in gambling in the context of behaviour towards risk, and the first question we must answer in this context is the individual's motivation when he/she participates in gambling. Any gamble offers the participant a probability distribution of prizes in exchange for a certain sum of money. The decision to participate would imply a judgement by the buyer that the probability distribution of prizes is 'worth' the price of a ticket. The judgement may be based on scientific reasoning, on superstition, on impulse or on addiction.

The traditional economic approach to choices under uncertainty has been based on the maximisation of an individual's expected utility[50]. Thus an individual faced with a lottery where he/she may win a prize of £1,000 with probability 1/100, and may win 0 with probability 99/100, is assumed to compare the probability-weighted utility of these two states with the cost of the lottery ticket. Within this framework, individuals may be risk averse or risk lovers; i.e. all other things being equal, they may prefer less risk to more, or vice versa. An individual's risk preferences determine the shape of his utility function.

In our example, the expected value of the lottery is arrived at by multiplying the pay-outs by their respective probabilities and then summing the results across possible outcomes. Therefore:

Expected value = £ 1,000 * (1/100) + £ 0 * (99/100) = £ 10.

By buying a ticket in this lottery, the individual may expect to receive £10 in prizes, or more precisely, if he plays a enough lotteries he can expect to receive a total sum in prizes, which is relatively close to £10 for each lottery played.

If people are indifferent to risk, they will be willing to pay up to £10 per lottery to be able to participate, and a price of £10 would constitute a fair gamble. Risk averse individuals will need an additional incentive to spend (certain) funds on outcomes that are governed by the laws of probabilities and, therefore, would be willing only to pay less than £10. On the other hand, risk lovers would be willing to pay more than the lottery expected prize return, to take on some risk.

In most activities, individuals behave as risk averse agents; they are prepared to pay insurance policy fees to transfer particular risks to insurance companies. More generally, people are prepared to accept lower expected values for a particular event, if that means that they can be more certain about the outcome.

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[50] Utility is an economic concept used in the theory of consumer choice to represent individual's preferences. Broadly, we can say that if a consumer exhibits 'consistent' preferences, then a utility function can be used to summarise his choices. Thus a consumer for whom Choice A has a higher utility to Choice B prefers A to B; alternatively if the utility of Choice B is higher than that of A the consumer prefers B, or, finally, the consumer may be indifferent between the two choices, in which case the utility of Choice A is as high as that of B. Unfortunately, utility is very difficult to measure in an objective way. For a discussion and an introduction to the Theory of the Consumer refer to any standard microeconomic textbook such as Varian H.R., *Microeconomic Analysis*, London W.W.Norton and Company, 1978.

In gambling, attitudes towards risk are reversed, since most individuals are bound to make losses. Some gambling activities are undertaken without the intervention of an intermediary. Others require the participation of agents who collect the bets and 'administer' the activity in return for a 'commission'. Furthermore, some gambling activities are taxed in one way or another. In the no-agent-no-tax case (a game of poker for example), gambling is a zero sum game for the gamblers. However, most of the publicly available gambling opportunities that are of interest for policy intervention do involve some form of intermediation and attract taxation. In this case, gambling is an activity with a negative net expected outcome for the universe of gamblers.

If we want to maintain the analysis of gambling within the framework of the expected utility maximisation approach, there is then a dilemma regarding the rationality of individuals' behaviour. Does the coexistence of a market for insurance and gambling imply that individuals behave inconsistently, or is there an alternate framework within which the two activities are compatible?

Alternatively, we can reject the traditional approach to behaviour under risk as being unsuitable to explain this aspect of human behaviour. A number of different explanations of attitudes towards gambling has been offered. Some of them try to reconcile gambling and risk aversion within the expected utility maximisation framework by claiming that there are ranges of income over which an otherwise risk averse individual may prefer to take financial risks, or, equivalently, where individual exhibit an attitude towards risk similar to that of risk lovers.

Other authors have departed from this approach. According to these theories, gambling will find its motivation in a combination of the explanations outlined below, and perhaps some element of irrationality.

- Gambling has a positive expected value.

  This may occur objectively in those activities where an element of skill contributes to determining the probability of winning, or subjectively because gamblers have incomplete information on the prize structure and the related probability distributions.

  The typical example of skill-intervention is horse race betting. A number of studies have shown that it is possible to identify betting strategies that have positive expected values[51].

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[51] An almost regular aspect of horse race betting is the favourite-longshot bias: the expected returns per dollar bet increase monotonically with the probability of the horse winning. The expected return from betting on a strongly favourite horse may therefore be positive. Ziemba and Hausch (Ziemba W.T. and Hausch D.B., *Betting at the Racetrack*, Vancouver and Los Angeles Dr. Z Investments Inc., 1986) found that in California bets on horses with odds lower than 1-10 deliver, on average, positive returns. Another betting strategy from the same study suggests that positive returns can be gained by betting on the exacta market: short odds horses have substantial probability of coming in exactly second and a bet on these horses in second place may give expected returns as high as 10% to 30%.

Finally Hausch, Ziemba and Rubinstein (Hausch D.B., Ziemba W.T. and Rubinstein M., *Efficiency of the*

In other words, the odds available, do not represent the objective probability of the outcome. Furthermore, other gamblers may assume that they are able to profit by their superior knowledge of the market and to obtain positive returns from particular combinations of knowledge and betting strategies.

Subjective positive expected returns may then result from participants' mis-information about the statistical properties of the game. For example, some people tend to disregard the operation of pure chance even in those situations where rationality would indicate that the outcome is purely random. Thus, "part of the lottery's clientele is immersed in a culture of superstition that attaches a specific significance to certain numbers"[52].

- Gambling has a positive utility in itself.

Some people may enjoy the non-monetary aspects of gambling and they may consider it as a leisure activity for any number of reasons. First, people may find amusement in the possibility of winning a possibly substantial amount of money. Thus the thrill of the draw creates utility in itself. Alternately, there may be a social aspect to gambling. For example, bingo and casino gaming are typical examples of betting activities where the social dimension is quite relevant (even though it is different in the two cases). Finally, some may consider the 'good causes' that will benefit from a lottery an incentive to participation in itself[53].

- The utility function is such that an individual is risk loving over lower income ranges, but may become risk averse if a jump in social class, or economic conditions, occurs.

This is the explanation for gambling given by Friedman and Savage[54]. Agents have a concave utility function within the income range that characterises their current position in society, indicating a risk averse attitude. However, when the increase in income or wealth is such that they are 'promoted' to a higher class, a new set of commodities becomes relevant, and the marginal utility of income increases. That is, over a 'class boundary' range the utility function is convex. In other words, the possibility of jumping to a higher class creates new needs and aspirations that were not considered before. A higher marginal utility will be attached to these new needs, and the individual becomes risk averse.

Market for Racetrack Betting, Management Science, 1981) developed a strategy for betting in the show and place markets. A positive return may often be obtained by comparing money staked on the same horse in the two markets.

[52] Clotfelter C. and Cook P., *Selling Hope*, NBER Harvard University Press, 1989.

[53] A 1986 survey in California suggests that the non-monetary element is more important for people in better-off classes.

[54] Friedman M. and Savage L.J., *The Utility Analysis of Choices Involving Risk*, Journal of Political Economy, 1948.

Irrational behaviour and gambling

In contrast to what is suggested in the explanations shown above, irrationality is often a force behind human behaviour. There is a wealth of evidence suggesting that, when faced with choices under uncertainty, people behave in ways that violate some of the axioms of utility maximisation and therefore show some departure from rationality.

Some experiments have been conducted by psychologists and, to a lesser extent, by economists, and have provided interesting results. The best known example is what is usually called the Allais paradox[55]. A version of this is as follows:

a) The player has a choice between two gambles:

The first gamble (a_1) gives £50 for certain:

a_1

£50	with certainty

The second gamble (a_2) gives the possibility of winning the following sums with the associated probabilities:

a_2

£60	with probability 33%
£50	with probability 66%
nothing	with probability 1%

b) In addition, the player has a choice between two other gambles:

The first gamble (b_1) gives the possibility of winning the following sums with the associated probabilities:

b_1

£60	with probability 33%
nothing	with probability 67%

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[55] Allais M., *Le comportement de l'homme rationnel devant le risque: critique des postulats et des axiomes de l'ecole americaine*, Econometrica, 1953.

The second gamble (b_2) gives the possibility of winning the following sums with the associated probabilities:

b_2

£50	with probability 34%
nothing	with probability 66%

The typical response of the player is to choose the sure thing: (a_1) in the first case and the first gamble; (b_1) in the second. This response violates the expected utility maximisation assumption, as does the combined choice of a_2 and b_2.

To see why the choice of a_1 and b_1 violates the von Neumann-Morgenstern expected utility hypothesis, consider the following relationships.

1) The choice of a_1 over a_2 indicates that, with respect to an individual's utility function u, it is true that:

$$u(50) > 0.33 * u(60) + 0.66 * u(50) + 0.01 * u(0)$$

Subtracting $0.66 * u(50)$ from both sides of the inequality, this is equivalent to:

$$0.34 * u(50) > 0.33 * u(60) + 0.01 * u(0) \quad \text{(condition 1)}$$

2) The choice of b_1 over b_2 indicates that, with respect to an individual's utility function u, it is true that:

$$0.33 * u(60) + 0.67 * u(0) > 0.34 * u(50) + 0.66 * u(0)$$

Subtracting $0.66 * u(0)$ from both sides of the inequality, this is equivalent to:

$$0.33 * u(60) + 0.01 * u(0) > 0.34 * u(50) \quad \text{(condition 2)}$$

Condition 2 contradicts condition 1. Therefore, there can be no utility function that satisfies both conditions. In other words, once a choice between a_1 and a_2 has been made, expected utility maximisation will dictate the choice between b_1 and b_2.

The two combinations of gambles consistent with rationality are those of a_2 combined with b_1 and a_1 combined with b_2. The fact that many people prefer a_1 to a_2 and b_3 to b_4 would suggest that the expected utility hypothesis may not be representative of individual behaviour. Savage[56], despite recognising the reasonableness of the 'typical' choice, sought to support the expected utility approach by arguing that the particular outcome is due to people not recognising the implied inconsistency of their behaviour. He claimed that once this is presented to them in a clear way, people tend to change their mind and decide upon the 'rational' choice.

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[56] Savage J., *The Foundations of Statistics*, John Wiley, 1954.

Appendix B:

An Overview of Gambling Activities
in Europe and the USA

An overview of world gambling

In Appendix B we summarise gambling and lotteries in the US and Europe. Table B1, based on a subjective assessment, summarises the relative importance of the different types of games in different parts of the world. Each continent has been assigned a number from zero (lowest) to ten (highest) to reflect the relative importance of each game.

Table B1 Lottery Games: Relative International Importance					
	Draw	Instant	Lotto	Numbers	Toto
North America	2	10	10	7	0
Central/South America	9	5	6	2	6
Europe	6	6	8	1	8
Australia	2	8	9	1	1
Asia	8	4	3	2	2
Africa	6	6	3	1	4

Source: Green P R, *The Whole World Lottery Guide*, World Media Brokers, 1991. The ranking is based on the subjective assessment of the author.

In recent years there have been marked shifts in the relative significance of the various lottery games; the major changes have been the decline of draw games and toto, and the growing appeal of instant and lotto games. Instant games have become popular as a game combining higher win probabilities with lower levels of prize money; whereas the installation of on-line networks and computerisation has made it possible for lotteries to offer large-scale lotto with huge jackpots.

Table B2 illustrates the types of gambling now permitted in the different member states of the European Community. No one form of gambling is available in all countries of the European Community, although all but one country have a horse race betting totalisator and roulette/card games. Private lotteries are held everywhere except in Portugal and Greece. The UK is the only European Community country not to have a national lottery.

Table B2

Gambling activities in the European Community

	National/State Lotteries				Private Lotteries	Horse race Betting		Casino Gambling		Bingo
	Class or Ticket	Instant	Lotto	Tote		Book-makers	Total isator	Roulette / Cards	Gaming Machine	
Belgium		■	■		■	■	■	■		
Denmark	■		■	■	■		■	■	■	
France		■	■	■	■		■	■	■	
Germany	■	■	■	■	■	■	■	■	■	
Greece	■			■			■	■	■	
Ireland		■	■		■	■	■			
Italy	■		■	■	■	■	■	■	■	
Luxembourg	■	■	■	■	■			■	■	
Netherlands	■		■	■	■		■	■	■	
Portugal	■		■	■			■	■	■	■
Spain	■			■	■		■	■	■	■
UK				■	■	■	■	■	■	■

In Table B3 we summarise activity levels of gambling in the European Community in millions of ECU. In terms of total gambling turnover, most gambling takes place in the UK, followed by France in second and Germany in third place. The high level of activity in the UK ensures that betting with bookmakers is the most popular form of gambling in the EEC. Casino gaming follows in second place with totalisator betting third. Table 4 summarises market shares.

Table B3

Turnover of Gambling Activities in the European Community : 1989
(ECU millions)

	National/State Lotteries				Horserace Betting		Casino Gambling	Bingo	Total Turnover
	Class or Ticket	Instant	Lotto	Toto	Bookmakers	Totalisator			
Belgium		205	416		294	87	30		1,032
Denmark	36		76	173		58	NA		343
France		513	1,908	242		4,456	2,136		9,254
Germany	594	224	3,698	173	60	456	2,463		7,669
Greece	453	NA		299		194	50		996
Ireland		NA	181		290	117			588
Italy	NA		166	1,655	144	300	300		2,565
Luxembourg	7	3	18	1			50		78
Netherlands	18	NA	66	3		68	160		345
Portugal	162		242	36		1	83	1	525
Spain	2,984		1,071	183		3	338	1,304	5,883
UK				974	7,745	297	2,143	952	12,111
Total	4,254	946	7,840	3,739	8,533	6,037	7,763	2,257	41,358

Source: *Gambling in the Single Market : A Study of the Current Legal and Market Situations*; Commission of the European Communities, 1991.

Table B4						
Turnover of Gambling Activities in the European Community Market Share (%)						
	Lotteries	Lotto	Toto	Horseracing	Casino Gambling	Bingo
Belgium	20	40	0	37	3	0
Denmark	10	22	51	17	0	0
France	6	21	3	48	23	0
Germany	11	48	2	7	32	0
Greece	46	0	30	19	5	0
Ireland	0	31	0	69	0	0
Italy	0	6	65	17	12	0
Luxembourg	13	23	1	0	64	0
Netherlands	6	21	1	22	51	0
Portugal	31	46	7	0	16	0
Spain	51	18	3	0	6	22
UK	0	0	8	66	18	8
Total	13	19	9	35	19	5

Source: *Gambling in the Single Market : A Study of the Current Legal and Market Situations*; Commission of the European Communities, 1991.

Table B5 illustrates levels of betting per head in the EEC and confirms that gambling per head in the UK is the highest in the EC. Per capita gambling turnover in the EC is highest in the UK at 218 ECU; Luxembourg is ranked second followed by France and Ireland jointly in third place.

In terms of market share, the popularity of different types of gambling varies widely across the EC member states. Toto is the most popular type of gambling in Denmark and Italy, lotto is the most popular in Belgium, Germany and Portugal, whereas in Spain the national lottery is the most popular form of gambling. Betting on horse racing is the most popular form of gambling in France, the UK and Ireland, whereas the population of Luxembourg and the Netherlands spend most on casino gaming.

Table B5		Turnover of Gambling Activities in the European Community : 1989 ECU Per Capita							
	Total Turnover (ECU Million)	Population (Million)	Total	Lotteries	Lotto	Toto	Horseracing	Casino Gambling	Bingo
Belgium	1,032	10.0	103	21	42	0	38	3	0
Denmark	343	5.2	67	7	15	34	11	0	0
France	9,254	55.0	168	9	35	4	81	39	0
Germany	7,669	59.8	128	14	62	3	9	41	0
Greece	996	10.3	97	44	0	29	19	5	0
Ireland	588	3.5	168	0	52	0	116	0	0
Italy	2,565	56.0	46	0	3	30	8	5	0
Luxembourg	78	0.4	204	26	46	2	0	130	0
Netherlands	345	14.2	22	1	5	0	5	11	0
Portugal	525	10.6	49	15	23	3	0	8	0
Spain	5,883	39.1	151	76	27	5	0	9	33
UK	12,111	55.6	218	0	0	18	145	39	17
Total	41,358	320.0	129	16	25	12	46	24	7

Source: *Gambling in the Single Market : A Study of the Current Legal and Market Situations*; Commission of the European Communities, 1991.

Gambling in the UK

We have already presented evidence of participation rates in various gambling activities. We now turn to analyse the pattern of consumer expenditure in gambling in the UK. Table B6 presents data on expenditure on betting and gaming and compare it with total consumer expenditure.

Table B6	Consumer Expenditure	
	Betting and Gaming £m	Total Consumer Expenditure £m
1975	769	65,338
1980	1,520	139,606
1985	2,118	217,618
1990	3,081	349,421

Source: UK National Accounts, HMSO

Over the last 15 years, total consumer expenditure has risen by 435% (53% in real terms) while expenditure in betting and gaming has increased by only 300% (2% in real terms). The comparison is illustrated in Figure 10 where the index of real total consumer expenditure is compared with that for expenditure in betting and gaming.

Figure 10 Betting & Gaming versus Total Consumer Expenditure at Constant Prices
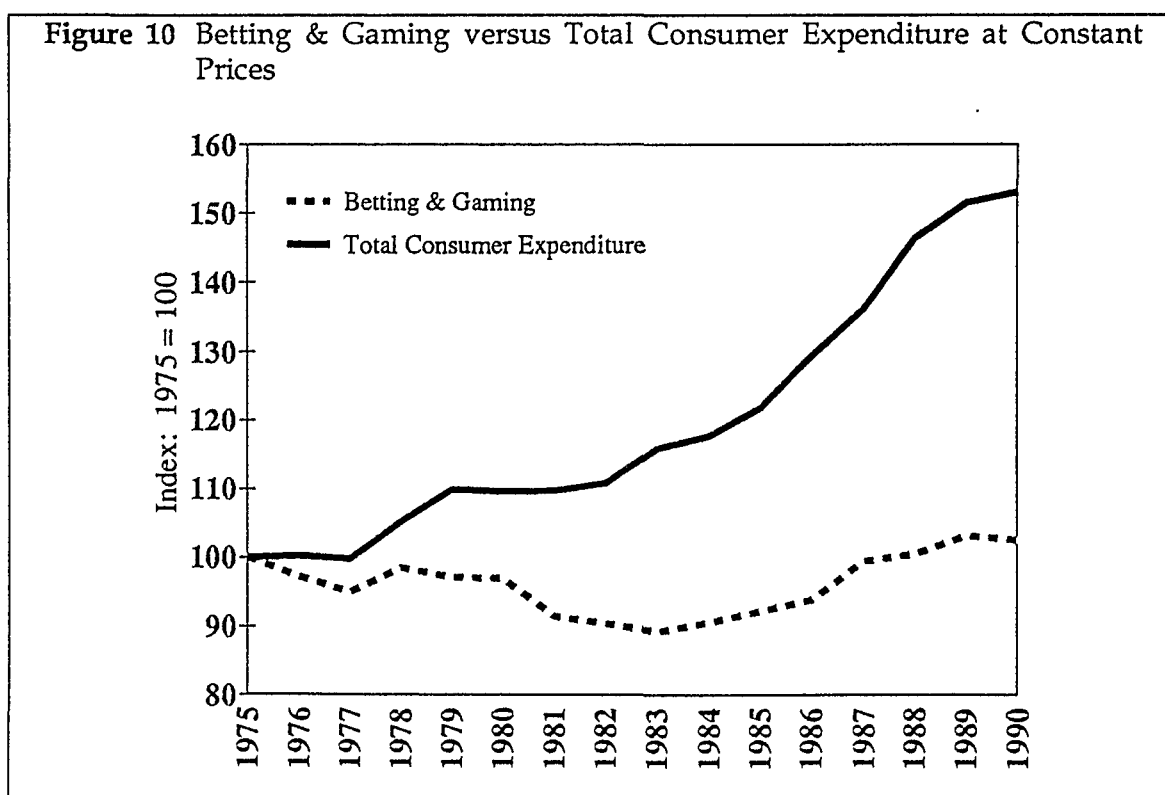
As a result, the share of betting and gaming in total consumer expenditure has steadily decreased from 1.2% in 1975 to less than 0.9% in 1990, as shown in Figure 11. Consumer expenditure represents the total amount of money lost by the public in betting and gaming activities (stake less winnings).

Figure 11 Share of Betting & Gaming of Consumer Expenditure at Constant Prices
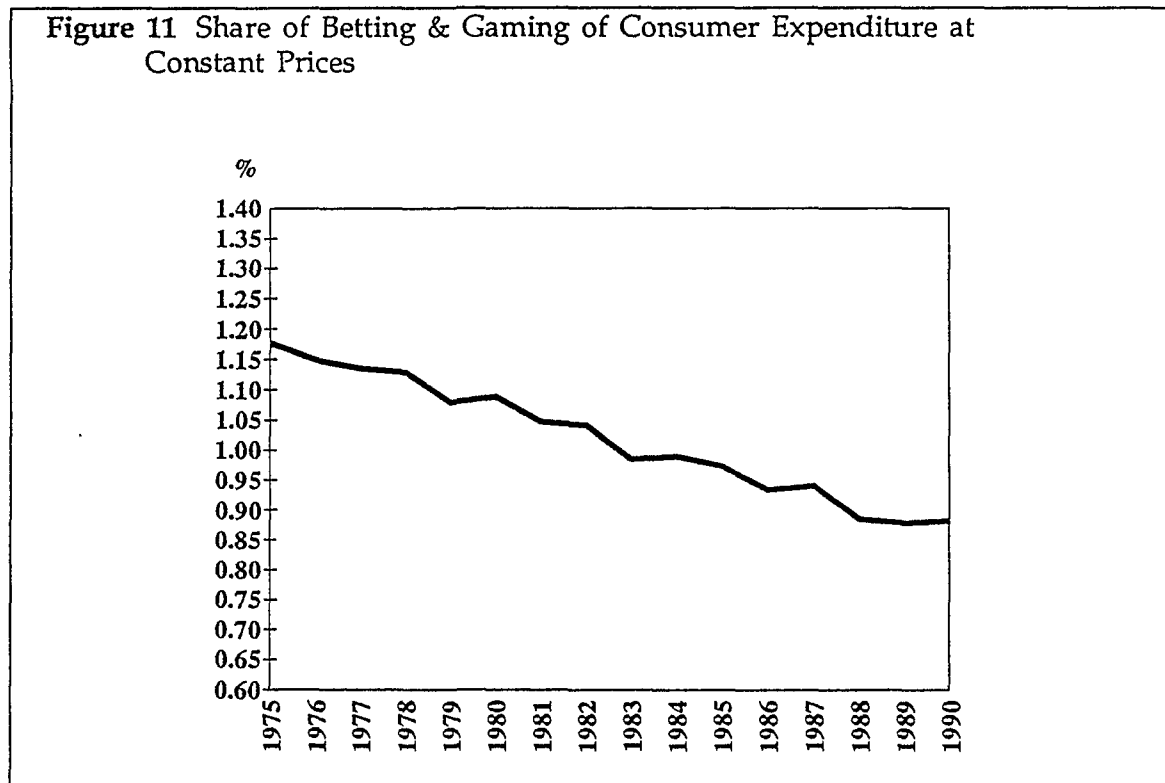
A breakdown of gambling activities is also available with reference to the total amount of money staked on different types of betting and gaming. Table B7 present estimates for the last five years by Mintel and derived from various sources[57].

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[57] These figures are similar, for last year, to those contained in a parliamentary answer given by Peter Lloyd on 12 March 1991:

	Estimated turnover £m/year
Off-course betting	5,734
On-course betting	743
Gaming machines	3,494
Casinos	1,881
Bingo	807
Football pools	715
Lotteries	23

The main discrepancy between these sets of figures is due to the exclusion, in the Mintel report of gambling in gaming machines.

Table B7 Gambling in the UK

	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90
Total money staked (£m)									
Bingo	468	492	496	496	517	556	626	641	660
Casino gaming	1121	1129	1482	1620	1615	1622	1722	1720	1881
Horse race betting	3470	3634	3612	3894	4205	4611	5050	5932	6525
Football pools	452	454	473	519	550	599	661	661	750
Lotteries	52	40	32	24	24	22	22	21	23
Total	**5563**	**5749**	**6095**	**6553**	**6912**	**7410**	**8081**	**8975**	**9839**
Market share									
Bingo	8.41%	8.56%	8.14%	7.57%	7.48%	7.50%	7.75%	7.14%	6.71%
Casino gaming	20.15%	19.64%	24.32%	24.72%	23.37%	21.89%	21.31%	19.16%	19.12%
Horse race betting	62.38%	63.21%	59.26%	59.42%	60.84%	62.23%	62.49%	66.10%	66.32%
Football pools	8.13%	7.90%	7.76%	7.92%	7.96%	8.08%	8.18%	7.36%	7.62%
Lotteries	0.93%	0.70%	0.53%	0.37%	0.35%	0.30%	0.27%	0.24%	0.24%
Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

Source: Mintel Special Report, Gambling, 1991

Over the five year period, the most important aspect has been the marked increase in the relative importance of horse race betting. Its share of total stakes has risen from 61% to 66%. On the other hand, bingo, casino gaming and lottery ticket sales have lost ground.

Combining these data with penetration figures for different gambling activities, it is possible to compute an approximate index of per capita annual stakes for each gambling activity. It turns out that, as expected, gambling activities differ widely in terms of average amount staked. Casino gambling and horse race betting show the highest averages at around £1,400 and £1,100 respectively; bingo and football pools average £85 and £45 respectively while less than £2 per player is staked annually in lotteries.

As already mentioned these figures represent the amounts staked, and not consumer expenditure. The relationship between the two depends on the pay-out rate of different games and the extent to which wins are subsequently reinvested in the game. As an overall average, the ratio between total stakes and total losses (expenditure) is around 3:1, implying a combined pay-out/reinvestment rate of two thirds.

Lotteries in the US

The following tables present data on the various types of lottery available in the US.

All of the US states operating lotteries offer instant lotteries and lotto, where prizes are paid out in terms of an annuity. Numbers games are the next most popular type of lottery offered.

Table B8 gives an overview of those US lotteries offering annuity jackpots. Tickets tend to be priced at 50c or $1, and draws take place once or twice weekly. Some of the record jackpots have reached enormous proportions; the largest annuity jackpot recorded in our data sample was $118,800,000.

Table B9 summarises cash lotto jackpots in the USA. Record jackpots have tended to be substantially lower where the jackpot takes the form of an annuity.

Finally, Table B10 summarises the instant games which are available. The odds of winning any prize may be as high as 27.8%, but maximum prizes are far lower than those offered for annuity and cash lotto games. Some of these games have 'Super draws'.

Table B8 Lotteries in the United States - Annuity Jackpots (1989/90 Fiscal Year)

State	Name	Format	Cost $	Frequency (No of draws a week)	Prize return	% Pool to jackpot	Winning odds		Record Jackpot
							Jackpot	Any Prize	
Arizona	The Pick	6/42 + Bonus No	1.00	2	47.5%	58.0%	0.000019%	0.184162%	11,700,000
California	Lotto	6/53 + Bonus No	1.00	2	50.0%	40.0%	0.000004%	1.481481%	118,800,000
Colorado	Lotto	6/42	1.00	1	50.0%	59.0%	0.000019%	2.857143%	18,000,000
Connecticut	Lotto	6/44	1.00	2	50.0%	51.1%	0.000014%	2.544529%	22,700,000
Delaware	Lotto	6/36	0.50	2	50.0%	56.0%	0.000103%	0.689655%	2,250,000
Florida	Lotto	6/49	1.00	1	50.0%	50.0%	0.000007%	1.862197%	106,500,000
Illinois	Lotto	6/54	0.50	2	50.0%	70.0%	0.000008%	0.133333%	69,900,000
Iowa	Lotto	6/39	1.00	2	50.0%	74.0%	0.000031%	3.597122%	10,180,000
Kentucky	Lotto Kentucky	6/42	1.00	2	50.0%	78.5%	0.000019%	0.184162%	6,000,000
Maryland	Lotto	6/49	0.50	2	50.0%	78.4%	0.000014%	0.197628%	12,280,000
Massachusetts	Megabucks	6/42	1.00	2	50.0%	64.0%	0.000019%	2.857143%	21,700,000
Massachusetts	Massachusetts Millions	6/49 + Bonus No	1.00	2	50.0%	40.3%	0.000007%	1.862197%	37,493,000
Michigan	Lotto 47	6/47	1.00	2	45.0%	62.7%	0.000009%	0.116822%	33,555,000
Missouri	Lotto	6/48	0.50	2	50.0%	74.0%	0.000016%	3.984064%	14,580,000

Table B8	Lotteries in the United States - Annuity Jackpots (1989/90 Fiscal Year)									
								Winning odds		
State	Name	Format	Cost $	Frequency (No of draws a week)	Prize return	% Pool to jackpot	Jackpot	Any Prize	Record Jackpot
New Jersey	Pick 6	6/46	1.00	2	50.0%	70.0%	0.000011%	0.128370%	17,900,000
New York	Lotto	6/54 + Bonus No	0.50	2	40.0%	50.0%	0.000008%	0.300300%	90,000,000
Ohio	Super Lotto	6/47	1.00	2	53.5%	70.0%	0.000009%	2.118644%	16,000,000
Oregon	MegaBucks	6/44	0.50	2	50.0%	66.0%	0.000028%	0.304878%	14,040,000
Pennsylvania	Wild Card Lotto	6/48 + Bonus No	0.50	2	49.0%	60.0%	0.000016%	0.492611%	29,600,000
Pennsylvania	Super 7	7-10-74	1.00	1	49.0%	70.0%	0.000007%	0.515464%	115,600,000
Rhode Island	Lot-O-Bucks	5/40	1.00	3	50.0%	50.0%	0.000076%	5.434783%	2,080,000
Virginia	Lotto	6/44	1.00	2	50.0%	78.0%	0.000014%	2.531646%	20,700,000

Table B9	Lotteries in the United States - Cash Lotto Games (1989/90 Fiscal Year)								
							Winning odds		
State	Name	Format	Cost $s	Frequency of draws per week	Prize return	% Pool to Jackpot	Jackpot	Any Prize	Record Jackpot
California	Little Lotto	6/39	1.00	2	50.0%	0.0%	0.000031%	3.584229%	0
D.C.	D.C. Quick Cash	6/39	0.33	6	50.0%	46.0%	0.000092%	0.748503%	0
Florida	Fantasy 5	5/39	1.00	3	50.0%	70.0%	0.000174%	1.004016%	1,000,000
Idaho	Fantastic 5	5/32	1.00	1	50.0%	0.0%	0.000497%	1.818182%	129,634
Illinois	Little Lotto	5/35	1.00	3	50.0%	60.0%	0.000308%	1.386963%	1,059,000
Indiana	Lotto Cash	6/44	1.00	1	50.0%	60.0%	0.000014%	0.152718%	6,000,000
Kansas	Cash Lotto	6/33	0.50	2	45.0%	82.5%	0.000181%	0.980392%	528,000
Maryland	Winners Take All	6/35	0.50	1	50.0%	74.5%	0.000123%	0.769231%	332,436
New Hampshire	Cash Lotto	6/36	1.00	1	50.0%	73.0%	0.000106%	4.504505%	1,508,000
New York	Cash 40	6/40	0.50	1	40.0%	15.0%	0.000052%	0.448430%	950,000
Vermont	Lotto Vermont	6/30	1.00	1	50.0%	50.0%	0.000168%	0.719424%	165,000

Table B10 Lotteries in the United States - Instant Games (1989 - 90 Fiscal Year)						
State	Name	Winning Odds: Maximum	$100 +	Any Prize	Maximum prize	Super Draw
Arizona	High Roller	0.0004%	0.0004%	14.2857%	10,000	-
California	Play Ball	0.0001%	0.0026%	14.2857%	50,000	1,000,000+
Colorado	Black Jack	0.0002%	0.0102%	20.0000%	21,000	-
Connecticut	Money Match	0.0004%	0.0015%	16.1290%	5,000	1,000,000
Delaware	High Card	0.0010%	0.0177%	24.3902%	1,000	-
D.C.	High Roller	0.0198%	0.0203%	20.4082%	1,000	-
Florida	JackPot	0.0033%	0.0033%	25.0000%	1,000	1,000,000
Idaho	Winter Wonderland	0.0033%	0.0100%	16.9492%	1,000	-
Illinois	Scratch Cash	0.0100%	0.0387%	23.8095%	200	2,000,000
Indiana	Hoosier Millionaire	0.0010%	0.0140%	13.8889%	5,000	1,000,000
Iowa	On the Money	0.0004%	0.0038%	20.0000%	4,000	-
Kansas	Instant Dough	0.0003%	0.0173%	25.6410%	5,000	-
Kentucky	High Card	0.0003%	0.0053%	19.2308%	1,000	1,000,000
Maine	Hockey	0.0083%	0.0709%	15.1515%	500	-
Maryland	Money Tree	0.0004%	0.0104%	17.2414%	5,000	-
Massachusetts	Lucky Spin	0.0007%	0.1222%	19.6078%	1,000	-
Michigan	Tic Tac Cash	0.0020%	0.0020%	14.2857%	1,000	50,000

State	Name	Winning Odds: Maximum	$100 +	Any Prize	Maximum prize	Super Draw
Minnesota	Celebrate Minnesota	0.0004%	0.0046%	14.2857%	5,000	-
Missouri	High Card	0.0000%	0.0005%	22.2222%	10,000	-
Montana	Tic Tac Toe	0.0004%	0.0004%	27.7778%	5,000	-
New Hampshire	3 Of A Kind	0.0033%	0.0033%	25.6410%	1,000	-
New Jersey	$500 Bag O'Money	0.0085%	0.0085%	12.6582%	500	-
New York	$10,000 Money Match	0.0001%	0.0018%	20.0000%	10,000	-
Ohio	Cash Explosion	0.0110%	0.0110%	9.0909%	500	200,000
Oregon	3 Cards Up	0.0104%	0.0104%	24.3902%	500	100,000
Pennsylvania	Double Play	0.0000%	0.0031%	27.7778%	5,000	1,000,000
Rhode Island	Baseball	0.0001%	0.0156%	11.3636%	50,000	-
South Dakota	Deuces Wild	0.0008%	0.0042%	26.3158%	2,500	100,000
Vermont	Moo-La	0.0167%	0.1000%	18.8679%	500	-
Virginia	Photo Finish	0.0001%	0.0105%	19.2308%	15,000	1,000,000
Washington	Aces Wild	0.0001%	0.0085%	17.5439%	10,000	-
West Virginia	High Card	0.0004%	0.0212%	19.6078%	5,000	-
Wisconsin	Vegas Money	0.0001%	0.0030%	20.8333%	21,000	50,000

Table B10   Lotteries in the United States - Instant Games   (1989 - 90 Fiscal Year)

Appendix C:

The empirical evidence on determinants of lottery sales

This appendix summarises our empirical analysis of the practical determinants of lottery turnover. While lotteries are a popular form of gambling, little is known about the factors affecting their demand, or why certain types of lotteries may be more successful in some countries than in others.

In an attempt to resolve the issue of what characteristics of a lottery contribute most to its success, we have used the information summarised in Table 9 in the main text, on a number of lotteries to analyse statistically the level of lottery turnover.

Please note that the results that this analysis produces is closely related to the data we have used. Table 9 covers a large number of European lotteries, but this data is not comprehensive, and this may impart a bias of unknown nature to our results.

Statistical methodology

The exercise is in two parts. Initially, we attempted to use the largest possible set of potential explanatory variables. Our aim was to identify which of these variables are relevant in explaining variations in lottery sales and, in this way, to specify a suitable form for the explanatory equation. Unfortunately, given the number of 'gaps' in the sample, the requirement to have complete records for the lotteries has forced us to reduce the size of the sample considerably. This may worsen our sample-bias problem.

Having specified our 'preferred' equation, we have then redefined our sample to include all observations for which the set of chosen explanatory variables is complete. Using this enlarged sample we have used our preferred equation to estimate the magnitude of the effect of individual regressors.

Throughout the analysis, per capita expenditure on lottery tickets has been used as an indication of the success of different lotteries. In the equation, this variable enters in logarithmic form.

Differences in consumer preferences could be accounted for by a number of factors. In particular, we consider the following possible determinants of numbers of lottery tickets sold or revenues:

- *per capita*

  This is the average wealth in terms of GDP per head, of participants. A number of hypotheses may be envisaged here. The tendency to participate in lotteries may be higher, the poorer (subject clearly to a lower limit) potential participants are. On the other hand, participants with a guaranteed standard of living may be tempted to participate in a lottery which may offer them potentially huge riches in relation to their own income.

- *the pay-out ratio*

  This is the proportion in turnover returned in prizes, which can also be used as an index of the expected prize return. Well-informed, revenue maximising, participants should take this into account when choosing one particular method of gambling over another, or one lottery over another.

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- *the odds of winning the top prize*

Most lotteries offer a range of odds for winning prizes of different magnitudes; for instance in most cases, the odds of winning the jackpot are very long indeed, whereas the odds of winning a minor prize may be as low as 1:4. If participants are aware of the true nature of the odds which are available to them, they should opt for those lotteries which, ceteris paribus, offer them a higher return.

- *the ticket price*

According to standard economic theory we would expect (all other things being equal) lottery sales to be relatively higher if ticket prices are low and vice versa.

We recognise that different type of games (lotto, instant lotteries, etc.) may have different average per capita sales. This may depend just on the different typology and the way in which they attract patronage. For this reason we have used a set of dummy variables to control for differences in average sales between different lottery types.

The Results

The sample selected for the first stage of the analysis contains 42 lotteries. The best specification using the above set of explanatory variable is one in which per capita GDP and pay-out ratio are used, together with the set of dummy variables. The estimated equation is:

Equation 1:   *Restricted sample*

$$\log(S) = \quad -6.04 \qquad -3.45\, d_D \qquad -4.14\, d_P \qquad -2.05\, d_I \qquad -3.65\, d_O$$
$$(-2.76) \qquad (-2.24) \qquad (-4.46) \qquad (-3.34) \qquad (-3.13)$$

$$+\ 1.38\ \log(Y) \quad +\ 5.91\ \log(R)$$
$$(\ 6.64) \qquad\quad (\ 3.20)$$

Number of observations: 42

Adj-R^2 =   0.61

$F_{(6,35)}$ =   11.76

SSR   =   76.86

where: S   is per capita lottery sales

         d_D is the dummy for daily lotteries

         d_P is the dummy for passive lotteries

         d_I is the dummy for instant lotteries

         D_O is the dummy for other types of lotteries (except lotto which is our reference type of lottery)

         Y   is per capita gdp

         R   is the pay-out ratio.

All values in US dollars, t-statistics in brackets.

Our specification explains 61% of the variability of per capita sales in the reduced sample used. Expenditure in lottery tickets increases more than proportionately with income.

Given that the typical pay-out ratio is around 50%, a 1% increase in this ratio will increase per capita sales by 12%. The odds of winning the first prize and the price of a ticket do not appear to have any significant role in explaining the success of a lottery. By concentrating on the lottery pay-out ratio we can enlarge our sample to contain 141 lotteries. Using this set of data we have re-estimated equation 1.

Equation 2: *Full sample*

$\log(S) =$ -5.93 $-1.22\,d_D$ $-2.09\,d_P$ $-0.93\,d_I$ $-2.20\,d_O$

(-4.68) (-2.47) (-7.00) (-3.31) (-4.87)

$+1.14\,\log(Y)$ $+2.87\,\log(R)$

(8.85) (3.35)

Number of observations: 141

Adj-R^2 =   0.45

$F_{(6,134)}$ =   20.12

SSR   =   223.80

Our preferred specification performs well even with the larger sample, even though the value of the coefficients are different in the two cases. The income elasticity of expenditure in lottery tickets remains greater than one. The effect of the pay-out ratio on sales has roughly halved: a 1% pay-out increases sales by around 6%.

So far we have assumed that different types of lotteries are characterised by different base levels of per capita sales, while the sensitivity of sales to income and pay-out ratio is the same for the different forms of lottery. We now want to investigate the possibility of different response patterns. To do this we have chosen the two most frequent types of lotteries: lotto games and instant lotteries.

The results from estimating the same specification (without, obviously, the set of dummy variables) using the two separate sub-samples of lotto games and instant lotteries highlight interesting differences.

Equation 3: *Lotto games*

$\log(S) =$ -6.51 $+1.22\,\log(Y)$ $+3.14\,\log(R)$

(-3.48) (7.10) (1.88)

Number of observations   52

Adj-R^2 =   0.49

$F_{(2,49)}$ =   25.73

SSR   =   94.54

Equation 4: *Instant lotteries*

$\log(S) =$ -7.50 $+1.04\,\log(Y)$ $+0.29\,\log(R)$

(-4.68) (4.68) (0.19)

Number of observations   40
Adj-R^2 =   0.34
$F_{(2,37)}$ =   11.03
SSR   =   52.20

The pay-out ratio is important, though not as much as before, in determining the level of sales of lotto games. This is however not true in the case of instant lotteries. This latter form of lottery has a lower income elasticity (not significantly different from 1). Therefore, while the share of expenditure spent on lotto games increases with income, that spent on instant lottery seems to be a constant (at around 1/20 of 1%).

Our results may be somewhat surprising. It is often claimed that poor people tend to spend a larger proportion of their income on gambling. Our cross section analysis seems to suggest a different picture of the relationship between income and lottery sales. Countries with higher per capita GDP are those where the share of per capita expenditure spent on lotteries (especially lotto games) is larger. However, the two aspects do not necessarily imply a contradiction. When considering individual behaviour, the level of income has to be assessed with respect to other personal characteristics (like age and household composition) and the economic environment. For example, earning £15,000 pa may be considered a good level of income for a 20-year old person. It is not as good an income for a 45-year old with large family.

These results cannot be used, therefore, to make inferences about the cross-population penetration rate of lotteries. More interestingly, our results give some conclusions about the optimal pay-out ratio, an important issue in designing a lottery. Optimality is, in this case, defined as the level which yields the largest surplus (revenues minus prizes).

From our estimates, the optimal pay-out ratio in the three cases are as follows[58]:

All lotteries	(equation 2)	74.2%
Lotto games	(equation 3)	75.8%
Instant games	(equation 4)	22.5%

---

[58] In terms of our variables, the surplus P can be expressed as:

$$P = S * (1 - R)$$

Keeping per capita income constant — this is not an object of choice for the lottery designer — and for each type of lottery, we can write:

$$S = const * R^a$$

where a is the coefficient of log(R) in the double-log specification of equation 1) to 4) in the text. Substituting for S in the definition of P and computing the first order condition for a maximum we find that

$$P \text{ is maximised when } R = a/(1+a)$$

Using the estimates for a presented in the text we obtain the optimal pay-out ratio for the various types of games.

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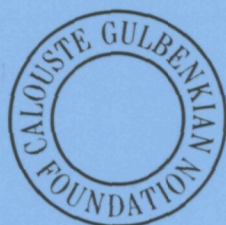Tec N., *Gambling in Sweden*, Totowa, N.J., Bedminster, 1964.

In March 1992 the Government published a White Paper making comments on "plans to introduce a national lottery in the UK in support of 'good causes'". This report assesses the potential of such a lottery against the background of gambling in general in the UK and in the light of the experience of other countries. It explains how modern lotteries work, how they might be run, estimates what such a lottery would raise, who would participate and reviews the arguments for and against. It provides the most comprehensive review of the issue currently available.

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