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AN ECONOMIC AND SOCIAL REVIEW OF GAMBLING IN GREAT BRITAIN

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ABSTRACT

The paper considers the nature and scale of the benefits and costs of gambling, with special reference to machine gaming. Although the industry is argued to be unlikely to have a significant macroeconomic impact, evidence is consistent with it generating considerable benefits to individual (responsible) consumers, whether measured by consumer surplus or through the pattern of responses to a wellbeing question. At the same time, a minority of users of gaming facilities, problem gamblers, appear to make consistently flawed decisions such that those with gambling disorder experience exceptionally low wellbeing. Public policy and regulatory decisions should consider the effects, on the margin, on both the net benefits to recreational gamblers and the net costs to problem gamblers. Many policy decisions may involve a trade-off between the welfare of recreational gamblers and the welfare of problem gamblers. Contemporary interest in targeted policies appears to represent an attempt to avoid the need to confront such a trade-off by searching for policies which are aimed very explicitly at problem gamblers alone.

1 INTRODUCTION

Almost always and everywhere, legislators and regulators have placed severe restrictions on the supply of commercial gambling services. Often the regulation is extreme to the point of legal prohibition, of gambling in general or of particular gambling activities. Thus, even after more than thirty years of an international trend towards liberalisation[1], commercial gambling, other

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[1] For example, the lotto game was adopted in almost all jurisdictions in the developed and some in the less developed world during the 1980s and 1990s; in the United States, the number of states with legal casinos increased from 3 in 1980 to 33 now; over the period, even Singapore introduced first lottery games, then football betting, latterly two world class casinos. Sauer (2001) detected historical long swings in societal attitudes to gambling, similarly as in the cases of alcohol and tobacco, and dated the start of a swing back to liberalisation around 1980.

than on state lotteries, remains totally forbidden in Mainland China while sports betting is still illegal in nearly all of the United States.

Relative to most other parts of the World, the United Kingdom currently offers a more liberal environment for the gambling industries. An exception is that large-scale, machines-focused casinos, such as have proved popular and successful in many parts of the United States and in other regions outside Europe, have not been authorised in the United Kingdom. But, otherwise, all major forms of gambling are available, to adults, through a range of dedicated venues, such as racetracks, betting shops, (small-scale) casinos, bingo halls and amusement arcades. Additional gaming opportunities are to be had at machines found in locations such as pubs and airports. Further, and unusually for Europe, residents are free legally to access and play on gambling websites wherever in the World they are situated.

Nevertheless, while availability of gambling is indeed widespread in Britain, restrictions still apply. In respect of gaming machines, there are regulatory limits on stakes and prizes and particularly severe constraints on numbers of gaming machines permitted in individual casinos (20) and individual betting shops (4). There is almost no research on the consequences, including any unintended consequences, of this array of restrictions.

That restricting gambling has been, and continues even now to be, the typical stance of governments in all parts of the World, including Britain, suggests that this is no normal product. On the one hand, where it is available, whether legally or not, its popularity indicates that large numbers of people enjoy the entertainment it gives them. On the other hand, restrictionist policies are found even in economically liberal societies, which in other spheres typically favour freedom of choice on the presumption that individuals are the best judges of their own welfare. Across the World, there therefore appears to be a strong current of opinion that gambling is ‘exceptional’ and has special characteristics which mean that significant numbers in the population would, unrestrained by restrictions, take systematically poor and self-harming decisions about their levels of consumption.

Underpinning this *Review* is an acceptance that both perspectives are legitimate. The substantial take-up of gambling opportunities by large numbers of individuals who consume gambling products, with no evidence of harm or regret, is taken as suggestive of a flow of benefits, possibly very large, from the availability of gambling. Evidence of harm, sometimes serious, to a minority of consumers indicates that there is indeed potential for flawed decision-taking to lead some people to levels and patterns of consumption that will later be regretted. As in other areas of government, reasoned public policy must consider both the gainers and the losers, both the benefits and the costs associated with an industry, and how these benefits and costs might change under different policy scenarios. This *Review* therefore begins by inquiring into the nature of the economic and social benefits and

costs of commercial gambling.[2] While the *Review* is most focused on machine gaming, many of the points and arguments in the debate are necessarily generic and therefore apply to gambling products more generally.

2 THE NATURE AND SCALE OF THE BENEFITS FROM GAMBLING

2.1 Economic impact

Lobbyists looking to win fiscal or regulatory concessions from government for any industry tend to emphasise the contributions the industry makes to national income and employment.[3] In the case of gambling, the industry scarcely qualifies as one of the commanding heights of the economy, for example it is thinly represented in the FTSE-100 list of companies with the highest asset values. Nevertheless, it accounts for significant consumer expenditure and employs significant numbers of people.

Expenditure on gambling is measured by Gross Gambling Yield (GGY), which is the amount per period that operators win from their customers. This, rather than the amount staked by customers, is the appropriate measure of expenditure since it is the amount left behind by users of the service after they have used it. It is the equivalent, for example, of box office revenue at cinemas, which is also the amount customers leave behind.

Latest data from the UK Gambling Commission (2012) for those parts of the gambling industry it regulated[4] relate to the financial year 2011-12. Industry GGY amounted to £5.8b of which £2.2b was generated by machine gaming.

Even once National Lottery expenditure (£3.1b GGY in 2011-12) is added, total GGY of gambling accounted for only 0.93% of consumer expenditure and approximately 0.6% of GDP[5], making the industry proportionately less economically important than in, say, Canada , the United States or Australia. Indeed, notwithstanding its much smaller population, expenditure on machine gaming in Australia was much higher in absolute

[2] Debate in Britain does not extend to proposals to restrict legal gambling to the point where a significant illegal sector would be expected to develop. The review therefore abstracts from what, in many jurisdictions, would be the principal benefit of liberalisation of commercial gambling, namely the avoidance of economic and social costs associated with supply otherwise being from criminal organisations.

[3] Governments in turn may have an interest in the potential gain in tax revenue from gambling privilege taxes (the term refers to extra taxes on the product over and above those, such as value added tax, levied on products generally).

[4] Its jurisdiction did not extend to National Lottery products and spread betting, regulated in the period by the National Lottery Commission and the Financial Services Authority respectively.

[5] Lottery GGY from National Lottery Commission Annual Report, 2012, Appendix A, consumer expenditure and GDP data from the Office for National Statistics.

terms than that in Great Britain (the sterling equivalent of more than £7b per year) at the time of the Report from the Australian Productivity Commission (2010). Similarly, casinos, dominated by machine gaming, have overtaken lotteries as the largest sector of the gambling industry in America and account, in an arithmetic sense, for the fact that gambling is a proportionately larger component of the American than of the British economy. Such international comparisons between countries with relatively similar cultures suggest that variations in the size of the gambling sector are driven, to an important extent, by what is permitted to be offered and it appears plausible that consumers in Britain would choose to spend significantly more of their income on gambling than at present if restrictions on machine gaming in or outside casinos were as low as in many American and Australian states.

In terms of employment, Gambling Commission (2012) estimated that there were 110,000 full- or part-time employees in the sectors it regulated, which is approximately 0.38% of total employment in the whole economy. Of these, 54,000 were in betting, 18,000 in amusement arcades, 15,000 in bingo and 14,000 in casinos. A further 6,000 were employed by gaming machine suppliers.[6]

To an extent, this break-down of jobs by sector conceals the true contribution of machine gaming to employment. In both betting and bingo venues, revenue from machines exceeded revenue from the supposedly core activity which defines the sector. Thus, GGY in betting shops in 2011-12 was £1.39b from betting and £1.45b from machines. In bingo halls, GGY was £133m from main stage bingo and £230m from machines. There can therefore be little doubt that many betting shops and bingo halls, and the jobs they support, are viable only given the revenue generated by machines. Similarly, given that social trends are driving many public houses to close, it is possible that some surviving jobs in that sector, outside gambling, are also dependent on machine gaming.

So, the number of jobs associated with gambling activities in general and machine gaming in particular is non-trivial. But should the economic and social value of the industry be equated with its arithmetic contribution to GDP or to total employment? The answer from economics is ‘no’. To be sure, in an austere economic climate such as Britain currently faces, changes in regulation with the potential to eliminate or create jobs in the sector might decrease or increase aggregate employment in the short-run given slack in some local labour markets. But regulatory arrangements are for the long-term and are appropriately designed according to long-run benefits and costs from different policy scenarios. In this context, neither the contribution of gambling to GDP nor its contribution to aggregate employment should be counted as a societal economic benefit. This is because there is no convincing case for believing that the industry creates *additional* output and *additional*

[6] In all cases, employment figures have been rounded here to the nearest thousand to facilitate ease of reading.

employment. Everyone faces a budget constraint. In the long-run, the proportion of household income that is spent rather than saved exhibits no strong trend. Therefore, if the gambling industry were permitted to grow by easing of regulatory constraints, it is likely that the increase in consumer expenditure/ employment would simply displace expenditure/ employment in other sectors of the economy. Similarly, if the industry were forced to contract, expenditure would be expected to be switched to other goods and services, leaving aggregate income and employment in the economy unchanged. Hence, even leaving aside that its share in overall economic activity is modest, it is unconvincing to argue that the current or any future, larger gambling industry would generate benefits at the macroeconomic level.[7]

This conclusion is not *universally* applicable. Eadington (1999) argued that whether casino developments in individual cities, regions or countries could increase aggregate output and employment depended on their potential to export their services. If the clientele were just local, expenditure would simply be diverted from other goods and services, such as alternative entertainments. In this case, *net* job creation would be unlikely.[8] However, if the casino development attracted new visitors from outside the area, their expenditure would be *additional* rather than *displaced* and this could increase the size of the economy. Thus Las Vegas and Macau developed historically by supplying gambling services which attracted expenditure from large neighbouring jurisdictions where the provision of such services was prohibited. At first, local structural unemployment was mopped up; and in the long-run the growing gambling industry was enabled by substantial inward migration that allowed additional jobs to be filled. The same scenario was followed in the case of some of the casinos on Native American reservations. But the model has low applicability to Britain at the national level where (aside from a small number of specialist London casinos catering to international high rollers) there are no gambling facilities of a size likely to draw additional visitors who travel specifically to gamble.

Rejection of the proposition that the gambling industry increases national output and employment does not, however, imply that the sector is without economic value. Even if the total output of goods and services is the same under two different scenarios, economic welfare is higher if the composition of that output under one of the scenarios better matches the consumption

[7] The influential Report from the Australian Productivity Commission (2010) reached similar conclusions from specific research it commissioned: "The gambling industries do not create net employment benefits, because they divert employment from one part of the economy to another" (p. 6.1); "longer-term employment effects of the gambling industry are likely to be negligible" (Overview, p.10).

[8] There may be a minor impact to the extent that different goods and services exhibit different degrees of labour intensity. For example, if large scale machine gaming facilities are capital-intensive and capture expenditure from more labour-intensive local restaurants, there may be a fall in the total number of jobs.

preferences of the population, allowing them to derive more satisfaction from the goods and services that are available.

It is the conclusion of this section that gambling is unlikely to raise GDP and the level of income in the society. Rather, any benefits from permitting gambling are likely to be *consumption benefits*. Availability of gambling products expands consumer choice and allows consumers as a group to extract more satisfaction from the income available to them as a group.

2.2 Consumption of gambling products

It is a presumption of traditional welfare economics that individuals are the best judges of their own welfare because only they know the intensity of the satisfaction that they experience from the act of consuming each good. They will allocate their limited budgets between goods in order to maximise the total satisfaction they obtain for the amounts spent. If an additional good is made available, some will judge that switching part of their expenditure to the new good will not increase their total satisfaction. They will be non-users and will be no better or worse off than before. Others will judge that reallocating some of their budget to the new good will increase the satisfaction they gain from their overall budget. They will become purchasers of the new product and will be better off than before. They are said, by their purchase of the new good, to have revealed their preference for the new good. Welfare economics attempts to value *how much* better off they are through analysis of the demand for the additional good (of which more below).

A large proportion of British adults reveal at least some preference for gambling services by choosing to allocate part of their budget to gambling products. The British Gambling Prevalence Survey, 2010 (BGPS) was the most recent large-scale exercise to collect information on participation among residents (aged 16 or above). 73% of respondents had gambled for money in the preceding twelve months. Discounting purchases of National Lottery tickets, gambling had still attracted a majority (56%) of respondents. 13% of all respondents had played on slot machines.

It is of interest how these figures compare with participation-rates in other leisure activities. *Taking Part* was an annual survey of the use of leisure time in England, conducted for the Department for Culture, Media and Sports. Using the 2010 edition to ensure comparability with BGPS, some past- year participation-rates were: 69% for eating out in restaurants, 48% for going to pubs, bars or clubs, 48% for cinema attendance and 39% for using a public library. Relative to other leisure pursuits and entertainments that are considered mainstream, gambling therefore attracted a similar or higher level of participation across the population.

Most of those who had gambled exhibited no signs that they were gambling in any sense irresponsibly. The BGPS administered (to all respondents who reported having gambled in the preceding twelve months) two screens in common usage, internationally, for identifying problem

gambling. The screens pose questions to detect patterns of behaviour associated with either dependence on gambling or harm from gambling. The DSM-IV screen has ten questions and the score can range from 0-10. A threshold of 3 is used to classify a subject as a problem gambler. The PGSI screen has nine questions and the score can range from 0-27. A threshold of 8 is used to classify a subject as a problem gambler.

A large majority of past-year gamblers (87.2%) and more than two-thirds of slots players (68.4%) scored zero on *both* screens, indicating that they displayed no indications of suffering any degree of dependence on, or harm from, gambling.[9] Note that a somewhat extreme requirement is being adopted here for gambling to be regarded as 'responsible'.[10] For example, Question 1 of the PGSI asks respondents whether they have bet more than they could afford to lose in the preceding twelve months (never/ sometimes/ most of the time/ almost always). A respondent who answered 'sometimes', but who answered 'never' to each of the other eight questions, would score 1 on the screen. Such a respondent would not qualify, with our extreme criterion, as a 'responsible gambler' even if he scored zero on the DSM-IV screen and even though this set of responses would not normally be interpreted as a cause for concern. But the extremity of the criterion here for defining a gambler as 'responsible' serves only to underline that a very large majority of British gamblers indeed play responsibly. There therefore appears to be no obvious reason to doubt that their decisions over how much of their budget to allocate to gambling are taken without being distorted by addiction or by having developed unhealthy attitudes to gambling. Spending money on gambling may then be taken as a 'rational' decision, signalling that they expect to gain additional satisfaction compared with a counter-factual situation where gambling was unavailable and the portion of budgets allocated to gambling had to be dedicated instead to less preferred goods and services. This gain in satisfaction is the consumption benefit of gambling. In welfare economics, consumption benefit is measured by *consumer surplus*, which is a concept employed in cost-benefit analysis across a very wide range of spheres of public policy.

[9] Data from the BGPS quoted above were drawn from the official Report (Wardle et al., 2011). Those here and below are own calculations from the data set as downloaded from the UK Data Archive.

[10] If the qualification for 'responsible gambler' were the more conventional one that the respondent scored below the threshold for 'problem gambler' on both screens, the proportions would increase to 98.6% for past year gamblers and 95.3% for past year slots players.

2.3 The concept of consumer surplus[11]

Suppose, using a story to illustrate the concept, I live in a village with a restaurant. How often I eat there depends on the price it charges for a dinner. So long as the price is no more than £30, I will go there once a month. It would be a treat and I place a value of £30 on the satisfaction I anticipate from the occasion, hence my willingness-to-pay of £30.

If the price were sufficiently lower, let us say £25, I would take two dinners per month: £25 is my willingness-to-pay for the second dinner. This is below my willingness-to-pay for the first dinner because the second would not have as much novelty value as before and I would expect to extract less satisfaction.

By similar reasoning, my willingness-to-pay for a third dinner in the month is lower still, £20.

As it happens, £20 is exactly the price the restaurant charges and so I am *just* induced to purchase three dinners per month. This is my 'quantity demanded' at a price of £20.

How much better off am I because there is a restaurant in the village? I am willing to pay £30 for the first dinner, which means that I expect to receive £30 worth of satisfaction. But I have to pay only the market price, £20. Hence I enjoy a 'surplus' of £10 from the transaction. This is not a money flow but rather *a valuation in money terms* of my net consumption benefit from that first dinner. My willingness-to-pay for the second dinner is only £25, so the second visit delivers just £5 of 'surplus'. On the third dinner, I get no surplus at all since my willingness-to-pay this time is only £20: I expect to derive £20 value (in terms of satisfaction) from the transaction but I have to hand over £20 to the proprietor, leaving me no better off for having made the third visit (i.e. I could have got the same satisfaction from spending that £20 on something else). So the marginal unit consumed does not deliver consumer surplus; but the infra-marginal units do.

It is evident that the presence of the restaurant in the village is 'worth'£15 per month to me because I eat there three times and the transactions together give me £15 (£10+£5+£0) of surplus. This is my 'consumer surplus' and one way of thinking about it is that, if a licence were required to use the restaurant, it would be worth my while to buy a one-month licence at any price up to £15.

Consumer surplus (here £15), rather than the revenue of the proprietor (here £60), is the measure used in welfare economics to assess the value of a facility to the consumer. It is formally defined as the excess of willingness-to-pay over price. Note that, for it to be a valid measure, I, the consumer, would

[11] Consumer surplus has been at the centre of attempts to measure benefits from gambling. Given the importance of consumer surplus, this section provides a short account of the general concept. Readers who have followed a first-level course in economics will probably wish to skip to the next section.

have to be rational and well-informed such that my willingness-to-pay was indeed an accurate evaluation of the satisfaction I would receive. Note also that the informational requirement for calculating consumer surplus is that the 'demand curve' must be known or at least capable of being estimated with reasonable precision. A demand curve for a good shows how many units the consumer will purchase at each possible price. Here, the story has been told for one consumer; but aggregation across everyone in the village is straightforward and knowledge of the quantity-price relationship in the market as a whole would enable calculation of total consumer surplus for the village the restaurant serves.

2.4 Application of consumer surplus to gambling

For consumer surplus to be measured, the demand curve must be known or be estimated. A demand curve is represented pictorially with the price of the product on the vertical axis of a graph and the quantity of the product (per period) on the horizontal axis. But, compared with other goods, it is not so obvious what 'price' and 'quantity' mean in the context of gambling products.

Australian Productivity Commission (1999) pioneered the use of consumer surplus as a way of evaluating benefits from gambling. It measured the quantity of gambling in terms of the number of dollars staked. It measured the price per unit stake as the amount retained by the operator rather than paid out as winnings (the take-out rate). With these definitions, price multiplied by quantity equals consumer expenditure (GGY), just as in, say, the restaurant industry.

The demand curve is used to estimate how much consumer surplus would be generated per period. However, the data for estimating a demand curve is seldom adequate (for example, it is speculative how much quantity would change were price to change if there has been no recent experience of price change). Therefore the Australian Productivity Commission had to make a series of assumptions about the shape and steepness of the demand curve to calculate a range of estimates for the consumer surplus associated with each gambling activity. Each assumption is captured by a particular value for *elasticity of demand*. Elasticity is a measure of how much quantity demanded responds to price. For example, a value of -1 would signify that a change in price of -1% from its current value would induce a change in quantity demanded of +1%. If elasticity of demand were indeed -1, current price would be at exactly the level that maximises operators' revenue (here GGY).

In the case where elasticity is -1, and assuming a linear demand curve, consumer surplus is exactly half of the industry's revenue (called, in the case of gambling, its GGY).[12] The assumption of elasticity = -1 is therefore

[12] If elasticity is more elastic than -1 (high price sensitivity), consumer surplus is less than half of industry revenue. If it is less elastic than -1 (low price sensitivity), consumer surplus is more than half of industry revenue. The general formula for

convenient, as well as plausible, in the general case. However, a complication in the context of gambling is that the fundamental assumption behind consumer surplus, namely that individuals purchasing the product are rational and well-informed, is clearly violated to the extent that part of demand is from individuals (problem gamblers) who have lost control over their decisions in this sphere. Therefore it would be illegitimate to include their purchases in the demand curve to be employed for calculating consumer surplus. This is a practically very important complication since, while the proportion of consumers who could be regarded as problem gamblers may be very small, their typically heavy use will likely mean that they account for a high proportion of demand. Some adjustment in the calculations must therefore be made if estimates of consumer surplus are to command legitimacy.

The adjustment made in the calculations in the first Australian Productivity Commission Report (1999) was somewhat convoluted. Separate demand curves were estimated for non-problem and problem gamblers. Problem gamblers were modelled as gaining positive consumer surplus in the usual way up to a 'normal' level of consumption but negative surplus on units beyond what is normal (they are then getting less satisfaction than their willingness-to-pay given their decisions are now flawed).[13]

Here, a more straightforward approach is taken in that we will be satisfied to estimate consumer surplus just for non-problem gamblers. Estimates for consumer surplus based on an elasticity of -1 can then be made using estimated current GGY from non-problem gamblers.

Of course, *total* GGY is known from regulatory returns. But how much of this should be discounted because it derives from problem gamblers? The Productivity Commission, informed by research, adopted a different assumed proportion for each gambling activity; but 30% was its central estimate for gambling as a whole. Evidence for what proportion of the British industry's revenue derives from problem gamblers is based on imperfect data from BGPS questions on time and money spent. But best estimates, from Orford et al. (2013), are only a little lower than those from Australia. Below, it will be assumed that one-third of gambling revenue is from problem gamblers and this component of consumer expenditure will *not* be counted as a source of consumption benefit.

Attempts to evaluate consumer surplus from gambling in Britain have been few. Farrell and Walker (1999) attributed considerable consumer surplus to National Lottery draws and considerable consumer surplus loss (close to £2b per year) from the presence of a 28 pence per ticket tax hypothecated to 'good causes'. This raised take-out by the operator and so suppressed demand.

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calculation of consumer surplus is $0.5(GGY)/\varepsilon$ where ε is the absolute value of elasticity.

[13] In the 2010 Report, the negative consumer surplus of problem gamblers was relabelled as part of social cost rather than being included as a (negative) component of aggregate consumer surplus.

They argued that the levy for good causes was an inefficient tax since the loss to consumers was high relative to the sum raised. Crane (2008) forecast the consumer benefit from the extension in the availability of electronic gaming machines envisioned in the Gambling Act (2005). She based forecasts of usage on international experience and assumed that elasticity would be -1.3 and that 30.3% of spend would be by problem gamblers. The analysis yielded an estimate of £3.2b per year of consumption benefit to recreational gamblers from the proposed network of new, more machines-focussed casinos (few of which have in fact actually appeared). This benefit was associated with a large projected increase in the proportion of household income spent on gambling products.

It is beyond the scope of the current review to attempt to make detailed estimates of consumption benefit from gambling in Great Britain in the current gambling environment. Significant primary research would be required to investigate what were the appropriate assumptions to make in each sector concerning elasticity and the proportion of current GGY derived from problem gamblers. Nevertheless, rough illustrative calculations are possible to show the orders of magnitude likely to be involved. With the assumptions of a linear demand curve, an elasticity of -1, and one-third of GGY not to be counted because it comes from problem gamblers, the amount of consumer surplus generated by activities under the regulatory control of the Gambling Commission in 2011-12 would have been more than £1.9b. (of which machine gaming would have accounted for £0.7b). This is a 'value of fun' equivalent, in terms of benefits to individuals, of giving every household in the country extra untaxed income of about £75 per year.[14]

The rough estimate of aggregate consumption benefit here is substantial but somewhat lower, emphatically so in per capita terms, than the latest estimates produced for Australian Productivity Commission (2010), which were about £7b. sterling equivalent, even using 'pessimistic' assumptions. Partly this is because lotteries (which accounted for about one-tenth of aggregate Australian GGY) are included in the Australian data whereas the British estimate is for only the Gambling Commission-regulated sector. Mainly, however, Australians' 'fun' is valued more highly in total because they indulge in more of it. The proportion of household income devoted to gambling is much higher than in the United Kingdom.

It is interesting to note that the Productivity Commission's estimates of consumption benefit, sector by sector, made for its 1999 Report, always exceeded even its most pessimistic assessments of social costs from problem

[14] For the economy, associated tax revenue would be an additional benefit: this is consumer surplus which does not accrue to consumers but rather is transferred to government. In 2011-12, gambling taxes on sectors regulated by the Gambling Commission yielded approximately £0.85b of which licences required for operation of gaming machines raised £0.2b (HM Revenue and Customs, Betting and Gaming Bulletin, June, 2013).

gambling. The results in the 2010 Report were broadly similar but consumer benefit, when calculated with the most pessimistic set of assumptions, fell short of social costs in the single case of the electronic gaming machines sector.

Eadington (1999) remarked on a tendency to treat gamblers as 'second class citizens'. Public policy debate in the field is typically based on discussion of such issues as jobs and taxes, and of course on impacts on problem gambling. In other areas of public policy, there is typically an emphasis on consumer interests, yet many decisions on gambling policy ignore impacts on recreational gamblers altogether. The figures here indicate that the consumption value of gambling is very substantial and the implication is that evaluation of policy should include attempts to assess the extent to which this might be enhanced or eroded by any proposed policy initiatives.

2.5 Wellbeing

The argument to date has been conducted in terms of traditional welfare economics, which remains at the heart of analysis of policy by governments. However, the whole notion of consumer surplus may appear abstract to non-economists. Moreover, perhaps there is more to life than consumption.

There is an increasing interest in economics and other social sciences in the idea that public policy should be evaluated not with a relatively narrow focus on consumption benefits but with an eye to how policy affects general mental and physical wellbeing. Wellbeing appears to be an elusive concept and might be thought to be too hard to measure to be accorded centre stage in policy evaluation. However, faith has grown in the validity and usefulness of 'happiness' data sets that have accumulated around the World over the last couple of decades. These data sets derive from asking large numbers of people how happy (sometimes how satisfied with life) they are 'these days', on a numeric scale, such as 1 to 10.

How reliable are answers to a happiness question in terms of truly measuring individual wellbeing? Confidence in the validity of self-reported wellbeing measures is based on a number of findings over the decades.

First, statistical modelling reveals intuitively plausible patterns in responses that are stable over space and time (Peiró, 2006). For example, marriage is consistently reported to raise expected happiness score by 0.6-0.8 points on a ten point scale; and very bad rather than very good health is consistently reported to depress expected happiness score by about two full points. This suggests that, on average, people's answers are considered and sensible and that meaningful insights are likely to be obtained from including such as gambling behaviour in the modelling.

Second, validation studies by psychologists have found that those reporting higher happiness scores are more likely to be rated as happy by others, engage more in spontaneous smiling and have lower incidence of various mental disorders (for detailed references, see Frey and Stutzer, 2002

and Peiró, 2006). Outside the laboratory, the large-scale Israel Health Survey found that answers to its happiness question were strongly correlated with indicators for stress, depression and sleep problems (Romanov et al. 2012).

Third, the medical literature provides evidence from longitudinal data that happiness score predicts *future* heart disease, stroke, suicide and longevity (see, for example, Koivumaa-Honkanen et al., 2000 and 2001, Diener and Chan, 2011).

As evidence accumulated that happiness data capture meaningful information on people's wellbeing, interest grew in using insights from analysis of the data to inform public policy. Indeed, in an influential book, Layard (2005) argued that *all* government policy decisions should be evaluated in terms of expected impact on happiness, an idea consistent with the intuition that happiness, rather than, say, high consumption, is ultimately what people seek from their lives.

The idea gained such currency that, in July 2011, the General Assembly of the United Nations passed a resolution requiring member states to gather data that would capture the importance of the pursuit of happiness "with a view to guiding their public policies". In the preceding year, the new Government in the United Kingdom had already directed the Office for National Statistics to undertake a new regular survey of wellbeing that would provide data by which the state of the nation and its progress might be judged.

Evidently sensing the zeitgeist, the Gambling Commission decided to add a happiness question to the 2010 BGPS. The exact question was: "Taking all things together, on a scale of 1 to 10, how happy would you say you are these days?"[15] For the first time, this would enable exploration of the relationship between subjective wellbeing and gambling behaviour.

It is obvious that irresponsible gambling behaviour may have consequences that lower quality of life. But are there any prior reasons for suspecting that responsible gambling could possibly enhance wellbeing? To be sure, recreational gamblers appear to derive (as noted above) considerable consumption value from gambling. But this is because of their taste for this particular mode of entertainment. Others, with different tastes, presumably enjoy high consumption benefit from whatever other activities please them. So, just considering consumption benefit, there is no strong prior that the level of overall wellbeing of (responsible) gamblers will be different from the level of wellbeing of those in similar life circumstances who choose to spend their money on different things.

On the other hand, gambling might conceivably deliver benefits beyond those of the entertainment value which players seek when they attend a venue. An analogy is that people may spend money on participating in sport just because it is, for them, an enjoyable entertainment. But it may have incidental

[15] The inclusion of "these days" is intended to encourage respondents towards an answer that captures their evaluation of their life as a whole rather than their mood that day.

effects on their health and wellbeing which they did not take into account in their purchasing decision and of which they may remain unaware. Then, sport would promote wellbeing, not just provide consumption benefit.

Downs (2009) proposed that recreational gambling might enhance individuals' wellbeing by providing thrills, hope, escape, social interaction and a feeling of gaining control over one's own life, factors often regarded as contributing to a sense of wellbeing. For example, Abramson et al. (2000) found that even illusory control (such as, for example, one might observe among players on gaming machines) was effective in protecting against feelings of hopelessness and depression. Casey (2003) noted the importance of daydreams about winning the lottery in the daily lives of the group of low income women whom she studied. Again, interaction with others is widely regarded in the psychology literature as important to a feeling of satisfaction with life. Much gambling takes place in social settings. The bingo hall can provide its patrons with a sense of camaraderie. Casino players appear to value social contact with dealers and other players (Cotte and Latour, 2009). Even in machine gaming, an apparently asocial mode of gambling, groups may form to turn the activity into a collective rather than an individual experience (Cassidy, 2012). All these are aspects of gambling which accord with ideas in psychology about what makes for happiness.

Forrest (2013) presents a statistical model which accounts for variations in happiness amongst the 7,721 BGPS respondents who answered the happiness question. A large number of predictor variables capture individuals' life circumstances (age, ethnicity, state of health, marital status and family structure, educational attainment, labour force status, income, consumption of alcohol and tobacco). To the model are added indicator variables describing gambling behaviour. One of these variables represents a recreational gambler, defined as a past-year gambler who scored zero on the PGSI screen.[16] The coefficient estimate on this variable is interpreted as the change in expected happiness score if the subject is a recreational gambler, rather than a non-gambler in otherwise identical life circumstances (as captured by the control variables).

In the male equation, the results indicate a statistically significant increase of just under 0.2 points on the happiness scale if the subject is a recreational gambler rather than a non-gambler. This is a non-trivial effect, close to that predicted by the model if the individual is moved from the mid- to the top-tercile in the income distribution.

In the female equation, this result is not replicated. There is no statistically significant difference between the happiness scores of recreational gamblers and non-gamblers, controlling for life circumstances. However, the paper reports supplementary analysis which reveals a similar positive effect as for men from a variable signifying a recreational gambler where bingo is included

[16] The paper also presents a model where gambler variables reflect scores on DSM-IV. Results are similar.

in the set of gambling activities in which the subject has engaged. Bingo, of course, is an activity which takes place in a conspicuously social environment. Controlling for life circumstances, the 394 female bingo players in question are happier than female non-gamblers and the difference is statistically significant.

The results reported by Forrest are evidence of a positive association between wellbeing and 'responsible' engagement in gambling. However, although there are prior reasons for suspecting that recreational gambling promotes wellbeing, the statistical model is not capable of testing the proposition. It shows association rather than causation. For example, the positive association might arise because there are unobserved personality characteristics which affect both happiness and participation in gambling. To illustrate, extroversion may promote happiness and extroverts may be more likely to go out gambling. This would yield positive correlation such as is observed in the data. The positive correlation does not therefore demonstrate causation (though neither does it rule out). Nevertheless that recreational gamblers, a large majority of all gamblers, appear to enjoy elevated wellbeing is interesting and there would be a degree of risk in policies that reduced their ability to engage in gambling: the risk is that intervening to modify actions which are associated with elevated wellbeing *might* prevent that level of wellbeing from continuing to be achieved.

Humphreys et al. (2011) focused on physical rather than mental wellbeing. They employed data from the Canadian Community Health Survey to explore the relationship between physical health and engagement in recreational gambling. Physical health was defined by whether an individual reported suffering from five common disorders (heart disease, high blood pressure, diabetes, mood disorder, anxiety disorder). Presence of each disorder was in turn modelled as dependent on a range of variables reflecting life circumstances, together with an indicator variable signifying a past-year gambler who had no positive endorsements on the problem gambling screen included in the Survey. The screen was the Canadian Problem Gambling Index (of which the PGSI screen administered in the BGPS is a derivation).

Prior reasoning cannot predict the sign of any relationship between physical health and engagement in responsible gambling. For example, gambling may harm physical health if it often takes place at unsocial hours (too many late nights) or in conjunction with unhealthy behaviours such as drinking or smoking. On the other hand, it may release tension and alleviate stress, known risk factors for, for example, high blood pressure. It may even, as noted above, increase mental wellbeing; and elevated happiness is a negative predictor of future mortality and morbidity (see references above).

So, the matter can be settled only empirically. Unlike Forrest (2013), Humphreys et al. are able to attempt to estimate causation (from gambling behaviour to health outcome) rather than just association. This they can do because Canadian data are drawn from provinces with sharply differing levels of provision of gambling. Essentially, their sophisticated econometric models

exploit a natural experiment where different individuals in the sample are exposed to varying levels of accessibility to gambling. Accessibility affects participation decisions, overcoming the problem that, otherwise, the factors other than life circumstances that influence participation are individual-specific, unobserved personality variables that are likely to influence the outcome variable directly.

Humphreys et al. find zero relationship between heart disease and engagement in recreational gambling. However, they find recreational gambling to be a statistically significant *negative* risk factor in the models for high blood pressure, diabetes, mood disorder and anxiety disorder. The size of the predicted reduction in the probability of suffering high blood pressure is particularly high. The findings must be treated with a degree of caution to the extent that estimates of the effects of recreational gambling prove very sensitive to detailed decisions on model specification. Nevertheless, this is the first study of the health benefits of recreational gambling and the results certainly point to hitherto undetected benefits from responsible gambling.

The two papers discussed in this section are pioneering in the context of the gambling literature. Wellbeing is though becoming a focus of study of other areas where consumption choices relate to goods about which there are public health concerns. For example, Odermatt and Stutzer (2012) employ 21 years of data from 40 European countries to examine the impact on life satisfaction of policies to deter smoking (price increases and restrictions on smoking in public places). Clearly there is considerable scope for more research into the effects of gambling policy on wellbeing. This will be facilitated if gambling prevalence surveys in other jurisdictions than Britain introduce wellbeing questions. This might well enable causation to be settled in countries where there is significant spatial variation in the availability of gambling services.

2.6 Conclusions

Very many people in Britain participate in gambling without any signs of dysfunctional behaviour. The application of the well established methodology of welfare economics demonstrates that their freedom to choose to gamble enables them to gain substantial consumption benefit. Early work in a newer tradition (wellbeing research) suggests that recreational gamblers enjoy enhanced mental and physical wellbeing, though of course more studies need to be done.

When decisions are taken in the area of regulation of gambling, a precautionary principle may often be proposed: restrictions should be continued, introduced or extended if there is a possibility that the liberal option would raise harm from problem gambling. But caution also needs to be exercised to the extent that most gamblers behave responsibly and enjoy high consumption benefit and (possibly) enhanced wellbeing. Restrictions on their choices run the risk that some of the considerable benefits they derive from

gambling may be lost. All decisions need to take into account potential impacts on the benefits as well as on the costs of gambling.

3 THE NATURE AND SCALE OF THE COSTS FROM GAMBLING

3.1 Flawed decision-taking

So far, the Report has accentuated the positive. The bulk of the analysis has drawn on traditional welfare economics, where individuals are assumed to make rational and well-informed decisions on how to maximise the satisfaction they derive from their incomes. If that is the starting-point, it is almost axiomatic that allowing them to make their own choices, unconstrained by regulatory restrictions, will raise their welfare.

However, to most people, it seems obvious that some gamblers make consumption choices that are demonstrably self-harming (and harmful also for their families). Such 'problem' or 'irresponsible' gambling is associated with adverse outcomes including financial stress, break-down of family relationships, loss of employment, engagement in fraud, and even elevated suicide risk. The proportion of gamblers classified as problem gamblers is small; but the severity of the consequences may be high in the typical case, meaning that the gambling sector may generate high economic and social cost as well as high economic and social benefit.

The adverse outcomes and high costs can originate only with flawed decision-taking by some gamblers. In traditional welfare economics, individuals are presumed to be 'rational'. But, in economics generally, interest has been increasing in why and how individuals come to make series of bad decisions which later they will regret. Consideration of this contemporary literature should allow insights to be gained into the root causes of the economic and social costs of gambling.

The majority of work on why rationality may 'fail' and why large numbers of consumers may make 'bad' choices has been conducted within the specialism of health economics, most frequently in the context of decision-taking about drinking, smoking and the eating of high-calorie, high-fat food. A valuable survey is provided by Cawley and Rhum (2011) and the ideas explored in their paper appear readily transferable to the context of gambling.

Of course, it is not axiomatic that it is a 'wrong' decision to choose a risky and unhealthy pattern of consumption. For example, choosing to smoke would appear to be rational if a fully informed individual had evaluated the value of the pleasure derived as greater than the expected health cost. There would be no obvious case for public intervention to influence such decisions other than for government to ensure that consumers took them with full information. In the case of smoking, health risks have been very well known for several decades. Indeed, Viscusi (1990) found that a large majority of smokers

considerably overestimated the health risks.[17] Therefore, while provision of full information is a legitimate responsibility of government in the sense that information is a public good (i.e. there would be no incentive for others to provide it), it should not be presumed that individuals will then make decisions which *others* view as sensible or which policy makers had intended. Adherence to traditional welfare economics, where an individual is presumed to be the best judge of his own interests, would suggest that individuals, once provided with relevant information, should then be left to make their own choices, whatever others think about whether they are 'sensible'. This is the 'liberal' model and points to narrow regulation where the role of the regulator is simply to provide information and ensure that the consumer is not misled.

But regulation of gambling goes much beyond this, in the direction of more paternalistic and prescriptive regulation. If regulation is intended to be in the public interest[18], the implication is that policy makers must feel implicitly that traditional welfare economics is based on an inadequate representation of consumer decision-taking. In the last decade or two, there have been attempts to modify traditional analysis to allow for the possibility of inconsistent decision-taking by individuals; and there have been more radical challenges from the new sub-disciplines of *behavioural economics* and *neuroeconomics*. Another strand of writing is termed *prospect theory* and this may be viewed as an application of behavioural economics in the particular context of decisions involving risk taking. It therefore has particular relevance to analysis of gambling.

Clearly limitations of space preclude attempting a complete review here of the evolution of relevant thinking in microeconomics.[19] But, in summary, it would be fair to say that a common theme in the different revisionist ideas is the notion of *time-inconsistent preferences*. In an adaptation of traditional welfare economics, some individuals may behave as if applying hyperbolic discounting to their decision-taking, i.e they understand the importance of future consequences but, at the instance of taking each decision, they give temporarily great weight to the satisfaction to be obtained today compared to satisfaction in the future.[20] In behavioural economics, Thaler and Shefrin

[17] This carries the apparently perverse implication that smoking rates are lower than would be socially optimal!

[18] Economists have noted that not all regulation is necessarily motivated by a wish to serve the public interest. Regulatory capture is a concept which proposes that industries themselves seek regulation because it serves their interests, for example by introducing barriers to new entry. Thus, in the gambling sector, incumbents may lobby for restrictions on new gambling activities that would be competitive with existing products.

[19] Again, the interested reader is referred to Cawley and Ruhm (2011).

[20] For example, an individual may decide that the expected costs of smoking exceed the expected benefit of smoking and therefore decides to give up from tomorrow morning: future health costs count sufficiently in the decision that they outweigh the valuation of present pleasure. But when tomorrow becomes today, pleasure today is

(1981) thought of decision-taking as involving a battle between two selves, a farsighted planner (who gives due weight to the future) and a myopic doer (who seeks immediate pleasure). In Lowenstein (2000) too is the notion that individuals know what long-term decisions would serve their interests- but they are blown off-course by immediate decisions being driven by emotion experienced in the heat of the moment (and possibly created in part by *cues*, such as the tempting whiff of hot doughnuts or, one might say, the clatter of coins falling from a slot machine). In neuroeconomics, Brocas and Carrillo (2008) linked long-term rational planning and short-term impulsive decisions to activities in different parts of the brain, where rational planning takes place in the neocortex but the limbic system responds to external cues without accounting for long-term consequences. The limbic system responds to cues *before* information is processed in the neocortex, so that some decisions get taken on the basis of emotion rather than rationality, again yielding sets of decisions that the individual will later recognise to have been 'wrong'. In prospect theory, a particular cognitive failure is *loss aversion* where individuals' decisions are strongly influenced by negative emotion from having lost wealth. For example, aversion to loss may cause an individual to carry on playing after losing money even though his prior plan had been to leave the casino once any loss reached the figure he could afford to lose (Barberis, 2012).

These ideas may have universal applicability. In everyone there may be a tension between a rational self and a self focused on the pleasure of the moment. But of course most people do not get obese and most users of alcohol and gambling services do not consume to the point of self-harm. One idea running through the various strands in the literature is that many or most individuals appreciate the dangers of lack of self-control in immediate decision-taking and their rational selves respond by identifying and implementing effective *pre-commitment* strategies. For example, if I find chocolate too alluring, I may choose to purchase only one bar in my weekly shop rather than maintain a more generous inventory which may be consumed in a binge in the heat of the moment. Similarly those who understand that self-control may be lost in the casino might decline to attend at all or else take with them only a limited amount of money (and no bank card).

There may also be social responses in terms of promoting pre-commitment. Cervallati and Vanin (2013) interpret the (costly) inculcation of religious and moral values into children as a response by parents to awareness of the danger that individuals will commit opportunistic crime in the heat of the moment despite the risk of later, severe negative consequences. Similarly, adherence to a faith which prohibits particular 'vices' (such as alcohol or gambling) could be interpreted as a form of pre-commitment to zero or moderate consumption. In a secular age, regulation may serve the same

given great weight so that quitting is postponed one further day (and subsequently indefinitely). The individual fails to bring his or her long-term plans to realisation.

function of helping people take decisions that their rational selves would favour. One form of regulation is prohibition; but current regulatory thinking in gambling draws more explicitly on ideas around pre-commitment by favouring facilities for individual gamblers to exclude themselves from particular venues or to set loss limits prior to the start of a gambling session. Such options may provide more effective pre-commitment strategies than were previously available to gamblers sufficiently self-aware to appreciate the risk that they will deviate from long-term plans in the heat of the moment.[21]

The theoretical framework around the notion of time-inconsistent preferences provides a rationale for why gambling yields harm to individuals who fail to recognise, or fail to cope with, the potential for repeated consumption decisions over time to lead to harmful outcomes. Of course, the proportion of gamblers whose behaviour is evidently self-harmful appears from prevalence surveys to be low. But the harm may be great and the following sections investigate the scale of the harm.

3.2 Attempts to measure the economic and social costs of gambling

There have been a number of attempts to monetise the harm that dysfunctional gambling imposes on society (though no systematic research exists in the case of Great Britain). For example, Australian Productivity Commission (2010) estimated national economic and social costs from problem gambling in a one year period in 2008-9 as in the range AUD4.7b-6.4b. This compared with an estimate of benefits from gambling (principally consumer surplus, but also including tax revenue, which may be interpreted as consumer surplus transferred from consumers to government) of AUD12.1b-15.8b.[22]

It may be noted from this study not just that aggregate social cost is far below aggregate social benefit but also that, proportionately, the estimate of cost is presented with a much wider range than that of benefit. This reflects the conceptual and practical difficulties encountered in attempting to measure social cost. In fact, the Australian Productivity Commission could have considerably widened the range of its estimates had it allowed for the full

[21] Barberis (2011) notes that pre-commitment facilities may induce additional visits to casinos by prospective gamblers who had been sufficiently sophisticated to appreciate the risks but who had not successfully identified pre-commitment strategies of their own.

[22] Reith (2004) noted that it is generally considered that the Reports from the Australian Productivity Commission and from the National Gambling Impact Study Commission in the United States, each published in 1999, represented the most authoritative assessments to date of the impact of gambling and problem gambling. The focus here is on the Australian evidence because it was updated in the 2010 Report. The American study valued national problem gambling costs as USD4b but did not quantify benefits from gambling (Gerstein et al., 1999).

diversity of methodologies proposed in the academic literature for evaluating the costs of problem gambling.

A conference held in Whistler, British Columbia, in 2000 brought together academics from different disciplinary backgrounds to debate how to measure the cost of problem gambling. The papers from the conference, several of which were published in the *Journal of Gambling Studies* in 2003, reveal a striking lack of consensus over methodology that suggests caution in taking any purported estimates of social cost too literally.

The archetypical study first identifies which costs should be counted, for example divorces 'caused' by problem gambling.[23] Second, it estimates the physical quantity of each supposed cost, for example the number of divorces caused by problem gambling in the particular jurisdiction in the particular year. Third, it allocates a money value to each incidence of that cost and multiplies it by the number of incidences (as estimated in step two). Finally, it aggregates across all such costs identified for inclusion in the study.

The process requires multiple decisions about what costs are relevant and how to attribute a money value to each cost. Many of these decisions are controversial and tend to be systematically different according to the disciplinary perspective of the researcher, for example public health versus economics. Generally the Australian Productivity Commission estimates tend to be influenced strongly by economics, which perhaps at least makes for consistency given that its estimate of benefits was also based on classical principles of welfare economics.

The potential for different researchers to produce estimates that may be orders of magnitude different from each other follows from a number of issues.

First, it is debatable what should count as a social cost. Many harms fall on the problem gambler himself whereas classical welfare economics argues that these costs will already have been taken into account (*internalised*) in the gambler's willingness-to-pay (making the consumer surplus a *net* measure of satisfaction, which already accounts for expected harm). Again, economists define social cost as a reduction in societal wealth, such that, for example, money stolen by a problem gambler or bail out money given to him by his parents should not be counted a cost because the sum involved is transferred between members of society rather than lost to society (Walker and Barnett, 1999).[24] Researchers from other backgrounds may count amounts of theft and bail out costs as social costs in their analysis.

[23] Walker and Barnett (1999) provided a list of costs that had been featured in published studies up to the time of their article.

[24] On the other hand, the cost of investigating fraud by a problem gambler and the costs of trying and incarcerating him should be counted as social cost. The sum of money stolen represents a transfer but the costs of law enforcement use up real resources, reducing societal wealth.

Second, it is debatable to what extent social costs associated with problem gambling are *caused* by gambling. At least as observed in the population of those in treatment, problem gamblers have a high propensity to suffer comorbidities. For example Australian Productivity Commission (2010, p. 7.15) notes that, in a sample from the State of Victoria, 43% of subjects had at some time been diagnosed with anxiety problems, 55% with depression and 29% with alcohol problems. 19% reported problems with other drugs. Given that problem gamblers may experience a range of problems, it is hard to separate out any influence from gambling behaviour and, for example, gambling may be an outlet in which the individual's negative script is played out (i.e he or she may have found another route to harm in the absence of the opportunity to gamble and the negative outcome should not necessarily be attributed to gambling).

Third, it is very challenging to place money values on many of the negative outcomes associated with problem gambling, such as suicides or the emotional distress of family members. Of course, this general issue runs through cost-benefit analysis across government. If it is proposed to raise speed limits on motorways, there may be benefits in terms of time savings and costs in terms of extra fatalities. Both need to be monetised to enable benefits and costs to be compared with each other. But at least there are proxy markets where shadow valuations are revealed (there is a market for time savings embedded within markets for many convenience goods; and there is a market for fatality risk where high risk occupations must pay a premium to compensate for increased chances of death at work). The range of harms associated with problem gambling is though wider and consequently the task appears particularly intractable. The attribution of a money value to emotional distress is likely to involve the exercise of highly subjective judgements.

Each of these issues gives considerable scope to researchers to exercise judgement in constructing their measure of social cost, with the risk that their own ideological perspectives may drive the results they report. Even where a study is conducted very objectively, it is inevitable that there is an extent to which many important underlying assumptions appear somewhat arbitrary. For example, the Australian Productivity Commission deals with the causation issue simply by discounting 20% of outcomes (for example, number of divorces per year) associated with problem gambling.

The obstacles to credible estimation of social costs are still greater if the attempt is made to apply the methodology to particular gambling activities, such as electronic gaming machines. For example, international evidence consistently finds a particularly high prevalence of problem gambling among players of electronic gaming machines (Australian Productivity Commission, 2010). In Britain, 13.3% of BGPS respondents who played fixed odds betting terminals in bookmaker shops at least monthly were classified as problem gamblers according to the DSM-IV screen (Wardle et al., 2011, Table 6.4). But the typical problem gambler who had played on machines in bookmaker shops had also taken part in multiple gambling activities (Wardle et al., 2013)

and so it is problematic to attribute social costs of problem gambling specifically to the availability of these machines. When a new gambling opportunity arises, such as fixed odds betting machines in the early 2000s, it may not only displace expenditure from other forms of gambling but also displace problem gambling activity (Reith, 2004). It is therefore hard to establish whether there is additional harm from the specific, newly available activity.

Given the conceptual difficulties, and the considerable resources which would be required, there would appear to be little case at present for proposing a study of aggregate monetised economic and social costs in Great Britain from either gambling in the aggregate or from specific forms of gambling.

3.3 Wellbeing

As on the benefit side, an alternative approach to understanding the costs of gambling activity is to focus on wellbeing directly. As described earlier, Forrest (2013) exploits data from the BGPS to estimate a model to predict 'happiness' on the basis of indicators for gambling behaviour (and a large number of variables capturing life circumstances). The results are strikingly illustrative of the very low wellbeing typically experienced by those who have trouble with their gambling behaviour. Whether working with the DSM-IV or the PGSI screen, classification as a problem gambler (controlling for variables capturing life circumstances) proves to have a very large and statistically significant negative impact on predicted happiness score, comparable with that from moving the subject from a state of "very good" to a state of "very bad" health. The probability that the subject's response places him or her in the bottom 15% of the population, ranked by happiness, is tripled. Further, particularly for women, a positive score on a screen (but below the threshold for classification as a problem gambler) has a lesser *but still strong* impact on the subject's expected wellbeing. And those who reported having a relative with a gambling problem also exhibited strikingly low levels of wellbeing. Together, all these findings suggest that problem gamblers and their families indeed represent a group in the population whose problems are very real and very serious. Moreover, the problems extend to "at risk" as well as "full blown" problem gamblers, raising the question of whether the published prevalence rate understates the extent of problem gambling by basing classification on too high a threshold score on the screen.

Addressing social cost directly through measurement of wellbeing overcomes many of the problems associated with monetary evaluation of the economic and social cost of gambling.[25] For example, it is not necessary to consider either how much strain problem gambling places on relationships or

[25] Potentially it also offers a route to refining and improving measurement of problem gambling prevalence through the standard screens.

how these strains should be represented in terms of money. Instead one focuses on the end product, wellbeing itself. However, the wellbeing approach cannot resolve the issue of causation. The unhappiness of problem gamblers may be caused by their gambling. But, alternatively, both their unhappiness and their disordered pattern of gambling behaviour may have a common cause associated with unobserved (perhaps unobservable) personal characteristics: gambling behaviour may just be reflecting the fundamental problems in their lives that are making them unhappy.

This is not to say that the findings of Forrest (2013) do not have important implications. First, whatever the source of their unhappiness, problem gamblers typically exhibit very substantially depressed wellbeing, comparable with people experiencing serious physical illness. This makes the case for allocating significant resources to diagnosis and to treatment (so long as treatment has been demonstrated to be effective). Generally across the World, including in Britain, provision of services in the area of problem gambling has been much more limited than should be expected given the very low wellbeing of problem gamblers. Second, problem gambling is relatively rare in the population and problem gamblers are therefore generally hard to reach and identify. But there is a concentration of problem gamblers in certain types of gambling venue, such as casinos and bookmaker shops. Given that problem gamblers are such a vulnerable group as demonstrated by their low level of wellbeing, there is an evident strong duty of care on operators to attempt to mitigate their problems. There is also an opportunity for regulators to reach out to problem gamblers and to try to help them through influencing the gaming environment.

4 POLICY PERSPECTIVES

4.1 Overview

The bulk of this *Review* has focused on attempts to evaluate the benefits and costs of gambling, whether by employment of the traditional tools of welfare economics or by application of the infant science of happiness studies. According to the authoritative work of the Australian Productivity Commission (1999 and 2010), economic and social benefits exceed economic and social costs by a considerable margin for commercial gambling considered in the aggregate though the balance of advantage is less clear-cut when electronic gaming machines (which are much less restricted in most of Australia than is the case in Great Britain) are considered separately. But this is evidence from just one country and discussion, above, of the methodological problems provides a clue as to why researchers have been shy of formally attempting to weigh benefits and costs in other jurisdictions.

In a sense, it does not in fact matter that we cannot assess (using formal cost-benefit techniques) whether the gambling industries generate a net benefit for society in Great Britain. An answer would be needed only if

prohibition were on the agenda, which it is not. Rather, policy debate focuses on marginal changes such as whether casinos should be permitted to have more gaming machines or whether stake limits should be varied for machines in bookmaker shops. Regulatory changes such as these are properly informed by considering marginal benefits and marginal costs rather than total benefits and total costs.

But the long discussion above of total benefits and total costs did serve a purpose. It demonstrated something important and relevant to current policy formulation. Whatever the imprecision of the estimates, it is beyond doubt that *both* the money value of the consumption benefits of gambling *and* the money value of the economic and social costs associated with problem gambling are very substantial in absolute terms. Therefore, even if a policy change had a relatively low proportionate effect on the consumption benefit and a relatively low proportionate effect on the economic and social cost, the absolute value of these two effects may nevertheless each be large. Therefore it is important that any regulatory policy proposal should incorporate formal consideration of *both* the potential effect on consumption benefit *and* the potential effect on the harm from problem gambling.

In assigning weights to the benefits and costs associated with any policy initiative, the regulatory regime will necessarily be influenced by its philosophy, and transparency perhaps demands that its philosophy be made explicit. This *Review* has established that gambling activity yields considerable economic and social value in terms of consumption benefit (entertainment). Because responsible participation in gambling is common, this benefit is dispersed across large numbers of the population. It has also established that the potential harm from problem gambling is very high. But, in contrast to the benefit from gambling, this harm is concentrated on a relatively small number of people, problem gamblers (and of course their families, and perhaps others with whom they interact, such as in the workplace). Thus gambling benefits very many people, each by a little, and hurts a rather smaller number of people, but each by a lot. This generalisation is consistent with assessment either using traditional welfare economics tools or direct measurement of wellbeing.

A *libertarian* perspective is that the state should not constrain the choices of the majority in order to protect a minority which appears to be subject to poor decision-taking. Reith (2004) cited a survey in Canada which had found that 63% agreed that gambling should not be curtailed, whatever its consequences. By contrast, advocates of a *paternalistic* approach would be concerned to intervene to 'protect' problem gamblers and might argue that it is they who should be the focus of policy because they tend to be disproportionately from disadvantaged groups, such as the poor and ethnic minorities (and, if not, become disadvantaged by virtue of the low wellbeing associated with gambling problems). Implicitly, the argument is that greater weights in decision rules should be assigned to benefits/ costs falling on the relatively few problem gamblers than to benefits/ costs falling on the many

recreational gamblers. The *traditional welfare economics* approach is not to ignore either benefits or costs and not to assign weights but simply to measure the prospective gains and losses from a policy and 'approve' it if the projected gains exceed the projected losses. The identity of the gainers and losers is not taken into account. This is the most common approach in government to formulation of policy. It has the advantage of avoiding value judgements over the assignment of weights (albeit that setting all weights implicitly equal to one could itself be regarded as a value judgement). It is assumed below that this approach underpins how regulators approach decisions over policy in the sphere of gambling.

4.2 Principles in policy formation

Application of cost-benefit analysis of any proposed intervention would proceed by assessing:

(a) the likely effect on the (considerable) entertainment value derived from gambling facilities by responsible gamblers;
(b) the extent to which the (considerable) costs experienced by problem gamblers would be either mitigated or worsened; and
(c) the resource costs involved in putting the intervention into practice.

Given the conceptual problems discussed above, it is unlikely that precise monetary values could be placed on the three items in the cost-benefit analysis. Rather, judgements will have to be made about the orders of magnitude involved under each heading. But it is of course highly desirable that such judgements are informed by some evidence.[26]

Some policies should be easy to approve. For example, regulators should strive to ensure that full information, in a form that is easy to understand, is provided regarding the games on offer: the chance of winning the jackpot, the typical cost of an hour's play, and so on. Since there is consistent evidence that a proportion of all gamblers, but especially problem gamblers, misunderstand some basic features of electronic gaming machines, additional information should help both responsible and problem gamblers to improve their decision-taking over how much and on what to gamble. And resource costs of supplying such information may be relatively low.

In principle, provision of voluntary pre-commitment facilities should also be relatively uncontroversial. That such options should be available is supported by the theoretical framework employed above to account for flawed

[26] Without scientific evidence, policy is in danger of being driven by vested interests. For example, demands for more rigorous controls on one sector of the gambling industry may be made by a group set up purportedly in the public interest. It may use highly selective evidence and in reality it may represent another section of the gambling industry keen to limit competition.

decision-taking by those whose gambling appears to be self-harming. The empirical evidence on the potential of appropriate facilities to mitigate problem gambling harm, though limited, is encouraging (see, for example, Ladouceur et al., 2012). Moreover, if setting limits on losses or length of playing time is voluntary, the choices of those who do not have problems with their gambling are not constrained and therefore they should be no worse off. Indeed, some may be better off: those who do not gamble, even though they would find it entertaining, because they fear that they would deviate from their planned level of spending once in the casino (Barberis, 2012).[27]

While some possible regulatory interventions do not imply the need to trade-off between lower entertainment value and lower gambling harm, many potentially do. For example, most forms of restriction of choice, in terms of accessibility of venues, stake sizes, intensity of play, and so on, may offer some potential for mitigating harm from problem gambling but might well reduce the satisfaction of those who gamble without harm to themselves and others.

Research on the effects of environmental and structural aspects of gaming on problem gambling is much more common than research on how these features affect the pleasure of recreational gamblers. There is therefore little prospect that a meaningful forecast could be made of how the demand curve for recreational gamblers would be shifted (and consumer surplus thereby changed) if, for example, stake limits were lowered on gaming machines.

However, some basic relevant information could be obtained from relatively low cost research. Restricting the maximum stake further would in principle constrain choice and may make some recreational gamblers worse off (for example, it may be argued that some gamblers rationally choose to spend their gaming budget in quick spurts either because they are time poor or because a spin is more thrilling if more is at stake). However, it is quite possible that such restrictions would be non-binding on almost all of them because hardly any choose currently to stake above the level of the proposed new restriction. In this case, it would be likely that the reduction in maximum stake would be justified (on the ground that entertainment value would not fall by much) *if* it could be shown to be likely to help some problem gamblers.[28] This is a possibility; but research has not yet gathered information on stake

[27] There is though a potential for some loss of entertainment value if the pre-commitment scheme is very rigorous. For example, it may be more effective if spending limits are binding at all venues and this would imply a need for playing machines to require a player card or some other means of identifying players, such as fingerprint recognition (Reith, 2004). Taken to this degree, schemes may deter 'recreational players' from participating at all; and resource costs for the industry might also be high.

[28] It would be relevant for researchers to consider whether restrictions might be ineffective in terms of harm reduction- for example, if restrictions introduced in land venues just shifted problematic behaviour to the e-gaming sector.

patterns among current players and so policy makers face making choices uninformed by even basic evidence.

This general lack of evidence pervades discussion of most policy proposals to tackle problem gambling because such a wide range of options for trying to mitigate harm appear likely to involve a trade-off between this policy goal and the second goal of allowing responsible consumers to maximise consumption benefits from gambling.[29] In one sense the trade-offs preclude the achievement of both goals and cost-benefit analysis in some form is required where there are such trade-offs.

The policy dilemma reflects in fact a general proposition from mathematical economics (which has a proof analogous to that taught to high school students to justify the rule that the solution of simultaneous equations requires the number of unknowns to match the number of equations to be solved). The theory states that if there are *n* policy goals, they can be achieved only if there are *n* policy instruments available. Here there are two policy goals but essentially only one policy instrument (restriction) is typically considered. A new policy instrument might have the potential to allow both goals to be achieved or at least to make trade-offs between the interests of recreational and problem gamblers less acute.

4.3 Can trade-offs be avoided?

Restrictions often imply trade-offs because they affect both recreational and problem gamblers. A promising line of thought, supported by the National Responsible Gambling Strategy in Great Britain, is to pursue more targeted interventions to address the problems of current and potential problem gamblers. If these are viewed as a second policy instrument, and if they are expected to be effective, restrictions could then be set 'low' (to allow the potential entertainment value from responsible gambling to be maximised) while *targeted interventions* would serve to minimise harm associated with less healthy gambling behaviour.

There is an insufficient evidence base for applying this general strategy at present. However, a programme of research proposed by the Responsible Gambling Trust has high potential for settling many of the relevant questions. Targeted intervention is most feasible in machine gaming to the extent that gaming is based on technology and the research programme will examine whether the technology can be exploited to identify where a player is engaging in risky behaviour associated with problem gambling. For example, a pattern of risky behaviour might trigger such as warning messages,

[29] Another example relates to audio-visual features of machines. These may serve as cues which stimulate the tendency of the vulnerable to lose control of their spending (for evidence, see Wardle, 2013); but they may also serve to make the experience of 'responsible' players more satisfying by adding to the excitement.

reminders of the amount lost, advice on seeking help or even an enforced break in play.[30]

The data base for this programme of research will be industry records of play on machines within their estate. One obstacle to the research is that only patterns of play within a session will be observed and not who is playing and whether their past history of play appears problematic. Even where the player is known (for example, if he or she used a loyalty card), there will be no direct information on whether or not he or she is a problem gambler. Reliance will have to be placed on following consensual views from past research on what patterns of play constitute reliable markers for problem gambling.

Any system based on algorithms for applying targeted interventions will require a view to be taken on its propensity to generate false negatives and false positives. A high frequency of false positives would undermine the potential of the approach to help problem gamblers without the need to spoil the enjoyment of other gamblers, whose enjoyment might, for example, be affected by what they regarded as hectoring messages. On the other hand, field trials might investigate whether those who received interventions reported that their experience was in fact spoiled.

Another issue is that the algorithms could be made less blunt if they could distinguish between isolated and repeated cases of engagement in a risky pattern of play. Perhaps most regular players chase losses and lose more than they could afford at least occasionally. But many would question whether the state (represented by regulation) should intervene to protect a player whenever he or she transgresses its norms. To an extent, it could be argued that individuals should be left alone to learn from their own mistakes. The degree of harm from losing more than one can afford is unlikely to be large from a single occasion. But repeated risky behaviour typical of problem gamblers does carry a high probability of serious harm and intervention could then be argued to be more obviously justifiable. On the other hand, if the algorithms were to be able to identify patterns of *repeated* risky or reckless behaviour, information on who was playing would be required and this would imply that all players would have to be registered, something casual players might hesitate to do because of inconvenience or concerns over privacy.

Investigation of the feasibility of shifting the balance of harm minimisation strategy away from restrictions and towards targeted interventions is therefore likely to encounter some practical obstacles to be overcome. Nevertheless it appears the most promising avenue for regulators

[30] Alternatively the player could be 'nudged' towards a break by provision of a refreshment voucher. The potentially beneficial role of a break is supported by the theoretical framework since it removes the player from his 'hot' state, allowing time for his rational self to take control. The introduction of smoking bans in many jurisdictions may have been helpful because they enforced a quasi-compulsory break on some players. In New Zealand, a smoking ban was followed by a significant fall in calls to problem gambling help lines.

to explore given the essential policy dilemma that many possibilities for addressing problem gambling involve restrictions which incidentally reduce the ability of responsible individuals to choose to maximise the satisfaction they derive from their income by allocating an appropriate part of it to entertainment through gambling.

5 SUMMARY

1. Gambling is a popular leisure activity in Great Britain, at least as popular as such pastimes as attending the cinema. The proportion of gamblers who show any signs of problematic behaviour is low though the proportion of gamblers classified as problem or at-risk gamblers is higher for some branches of the industry than others, including in the slot machines sector.

2. Gambling in general and machine gaming in particular employ significant numbers of people. All gambling together contributes roughly 0.6 percent of GDP, making it a moderately important industry. However, its influence at the macroeconomic level is likely to be very limited to the extent that it simply displaces activity in other entertainment sectors.

3. Its value therefore lies not in its contribution to total employment or output but rather in the fact that its existence allows greater choice in how people allocate their leisure budgets. The majority of gamblers behave responsibly and it would be conventional to say that their choice to gamble implies that they derive more satisfaction from their limited budgets when they spend part of their income on gambling.

4. Economists traditionally measure consumption benefit by estimating consumer surplus. The technique was applied rigorously to the case of gambling in two reports by the Australian Productivity Commission. No similarly rigorous analysis has been conducted in Great Britain but rough calculations show a consumption value for Britain equivalent to the benefit from every household in the country receiving extra disposable income of £75 per year. In addition, further consumption value is created but transferred to government through specific duties on gambling.

5. Economic and social costs of gambling fall mainly on problem gamblers and their families. Valuation of the annual costs is fraught with conceptual and practical difficulties. Best estimates for Australia are that costs are substantial but below consumption benefit, by a wide margin for most forms of gambling but by a much narrower margin in the case of machine gaming. Similar research has not been conducted in Great Britain.

6. The last edition of the British Gambling Prevalence Survey included a question to elicit a self-evaluation of wellbeing. Recreational gamblers prove to be a little happier than non-gamblers but problem gamblers exhibit exceptionally low levels of wellbeing comparable to those found amongst victims of serious illness. Statistical modelling is unable to establish causation but the pattern is consistent with evidence (points 4 and 5 above) that aggregate benefits and costs from gambling are each very substantial, though

dispersed amongst many people in the first case and concentrated in relatively few in the latter case.

7. Because both benefits and costs are large, even if hard to measure, proposals to change regulatory rules should consider both the effects on the consumption value of responsible gamblers and the effects on the harm associated with problem gambling.

8. Some policy interventions offer the possibility of mitigating harm without constraining the choices of responsible gamblers. Others may be shown, *were* appropriate research to be conducted, to have high potential for harm reduction but limited potential to affect choices made by responsible gamblers. On the other hand, a wide range of policy options require a trade-off between the goals of maximising the entertainment value of recreational gamblers and minimising harm to problem gamblers and their families.

9. One strategy is to try to avoid the need to confront trade-offs by adopting few blanket restrictions on gambling choices while seeking to target harm mitigation measures explicitly at problem gamblers. In machine gaming, current research programmes seek to create algorithms that would identify patterns of behaviour associated with self-harming play and trigger on-screen interventions such as information, advice or enforcement of a break from play. The success of the approach would depend on how successful it proved to be in avoiding false negatives and false positives as well as on how effective interventions were in modifying behaviour.

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