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The impact of gambling on depression: New evidence from England and Scotland[☆]

Sefa Awaworyi Churchill^{*}, Lisa Farrell

School of Economics, Finance & Marketing, RMIT University, Australia

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ABSTRACT

Easy access to gambling outlets and the rise in the number of online gambling sites have led to a substantial increase in the prevalence of gambling among the British population. This increased prevalence is becoming a major problem due to the associated social and economic costs. This study investigates the effects of gambling on depression, using new data on England and Scotland, in a population-based sample. Using both the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) and Problem Gambling Severity Index (PGSI) scales of gambling addiction, we find evidence of a positive association between gambling behaviour and depression. Further, disaggregating the effects by gambling venue, our results suggest that online gambling poses a significant mental health risk compared to gambling in venues or outlets. Thus, we show that the high prevalence of gambling in Britain is associated with emotional and mental health costs.

1. Introduction and background

Gambling is increasingly becoming a major problem in many developed countries. A rapid increase in the number of outlets that have been legalised for gambling makes it much more accessible, and hence it is easier for people to gamble. Further, the proliferation of online gambling sites has led to a substantial increase in the prevalence of gambling in this new environment. Increased participation and problem related gambling are evident across the United States, United Kingdom and Australia, among other countries (see, [Abbott et al., 2016](#); [Calado and Griffiths, 2016](#); [Dowling et al., 2016](#)).

For most British people, gambling is part of their everyday lives, be it buying a lottery ticket, playing a gaming machine at the pub or placing sports bets online. The most recent (2010) British Gambling Prevalence Survey (BGPS) suggests that about 75% of adults in Britain gamble each year. Using the Problem Gambling Severity Index (PGSI), statistics from the BGPS (2010) revealed that the prevalence of problem gambling increased by 360,000 adults since 2007. Similarly, using the Diagnostic and Statistical Manual of Mental Disorders gambling addiction scale (DSM-IV), the prevalence of problem gambling increased by 451,000 adults since 2007. The prevalence of gambling in Britain in recent years has thus led to a renewed interest in understanding the implications of gambling behaviours. Given this heightened interest, a recent report from the Institute for Public Policy Research (IPPR) in Britain indicates that there are multiple costs from

gambling ([Thorley et al., 2016](#)). For instance, the adverse societal impacts of problem gambling include an increased demand on various public goods and services which in turn leads to higher costs to the government. Thus, [Thorley et al. \(2016\)](#) argue that, given the increase in the prevalence of gambling, the cost of gambling to the British Government each year is about £1.2 billion.

Additionally, there are psychological and mental health costs to individuals (and their families) that need to be accounted for. Depression is one of the most common comorbid conditions with gambling, and the existing empirical research generally supports the notion of a significant association between gambling and depression. For instance, pioneering studies (see, e.g., [Blaszczynski et al., 1990](#); [Linden et al., 1986](#); [McCormick et al., 1984](#); [Törne and Konstany, 1992](#)) as well as more recent studies (see, e.g., [Blanco et al., 2012](#); [Martin et al., 2014](#); [Moghaddam et al., 2015](#); [Quigley et al., 2015](#); [Savron et al., 2001](#)) all provide evidence of a positive association between gambling and depression.

Our study seeks to contribute to the growing literature on the emotional and psychological costs of gambling, in examining the relationship between gambling and depression. Given that gambling participation is increasing significantly, and is an integral part of British society, it is of the utmost importance that we gain greater insight into the relationship between gambling behaviours and the associated emotional and mental health costs. In this regard, we have identified two gaps in the literature that our study seeks to fill. First,

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^{*} Corresponding author.

E-mail addresses: sefa.awawory Churchill@rmit.edu.au (S. Awaworyi Churchill), lisa.farrell@rmit.edu.au (L. Farrell).

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while there are several studies examining the association between gambling and depression, much of the literature focuses on clinical samples whereas our study employs a population-based sample. Second, there is limited literature investigating the mental health implications of gambling in Britain, despite the increased prevalence of gambling in that country. We therefore provide new evidence on the relationship between gambling and depression in Britain using a population-based sample.¹ It is important to look at this relationship via population-based samples so that the impacts can be identified across the full spectrum of gambling behaviours, from abstainers to pathological gamblers.

The remainder of this paper is structured as follows. Section 2 discusses the theoretical background and research hypothesis, Section 3 introduces the data and variables used in our analysis, while Section 4 discusses the empirical model and methods. Section 5 presents the results and Section 6 concludes the paper.

2. Theory and hypotheses

Understanding gambling participation is particularly challenging from a rational agent perspective given that the expected return is negative. Gambling appears to be economically illogical. The common explanation for this irrationality is to suggest that there is a utility-enhancing, non-pecuniary component to the individual's gambling utility function, such that the net effect on utility is positive and hence welfare-enhancing. Such a framework allows for a more behavioural approach to understanding decision-making in conditions of uncertainty. The literature refers to utility functions of this form as the 'expected utility plus fun' utility function.²

A common conceptualisation of the fun component is presented in the dream function literature, which suggests that gambling is utility-enhancing through such drivers as the selling of hope and the buying of a dream (see, e.g., Conlisk, 1993; Simon, 1998). Advertisements from the betting and gaming marketplace portray gambling as a fun-generating (utility-giving) leisure activity. But, given the potential for harm, is it really the case that gambling is always well-being-enhancing? It is clear that problem and pathological gambling exists and that for some individuals gambling participation is not utility-generating, so why do these individuals continue to consume and hence behave irrationally? We propose an adaptation of the 'expected utility plus fun' utility function: the 'expected utility plus psychological effects' utility function (see Eq. (1)).

$$U_{gi} = \alpha + \beta_0 X_i + \beta_1 EU_g + \beta_2 P_{gi} + \varepsilon_i \quad (1)$$

where U_{gi} denotes the utility from gambling for individual i , X_i is a set of individual-level demographics and socioeconomic characteristics, EU_g is the expected utility from gambling and P_{gi} is the utility associated with the psychological impacts of gambling for individual i . Finally, ε_i is an individual-specific random error term.

Here the non-pecuniary component of the utility function is assumed to encompass all the emotional factors related to gambling consumption, which may be positive or negative. If the psychological effects are sufficiently positive to outweigh the negative expected utility from gambling, the consumer will continue to gamble. When the expected utility from gambling equals the utility from the psychological effects, the individual will be indifferent as to whether or not to gamble. And once the psychological effects are not sufficient to offset the negative expected utility, a rational agent will cease gambling. However, it is important to note that the switching point from gambling to not gambling will occur

¹ In the interest of brevity, and for ease of reading, we will refer to our data as a study of Britain although we note that our data covers England and Scotland only, and so excludes Wales. Equivalent data for Wales was not available to the researchers.

² The discussion in Hartley and Farrell (2002) critiques this 'expected utility plus fun' framework in terms of the ad hoc nature of the fun component as posited in the existing literature.

at different levels of gambling consumption, depending on the level of psychological effects that the individual derives from gambling. This is likely to be a function of a number of factors, including personality and the gambling environment.

The existence of problem and pathological gamblers suggests that, for some individuals, the ability to cease consumption is inhibited. It is commonly assumed that this inhibition is due to the individual having developed a gambling addiction which limits their ability to refrain from gambling (often referred to in the clinical literature as a loss of control). An interesting aspect of the framework outlined above is that the literature suggests that an individual's proneness to addiction is a combined function primarily of their genes, personality and the environment, but also of other factors (although this is not yet fully understood in the medical literature) (see, e.g., Ibáñez et al., 2003; Kreek et al., 2005; Potenza et al., 2005; Slutske et al., 2010).

Nevertheless, an individual's addiction proneness and the environment in which the gambling takes place (that is, whether in public venues or privately through online betting and gaming sites) together explain why we see some individuals able to cease gambling at a given level of consumption and others not able to do so at the same consumption level. This also explains why expenditure measures, or measures of the frequency of participation, may not be the best way to capture gambling-related harms. In the theoretical framework (as we have described it) gambling is rational for non-addicted consumers and irrational for addicts; and we argue that it is this irrational and suboptimal behaviour that leads to depression.

Persistent engagement in irrational behaviour is likely to result in mental health problems such as stress and anxiety, in turn leading to depression. As discussed above, the framework utilised here tells us that, when trying to understand the impact of gambling on mental health, we should look at the individual's level of addiction. Moreover, addiction scales and instruments themselves encompass a range of negative utility-generating harms and consequences of excessive gambling. It follows that gambling addiction is likely to be a strong predictor of depression. There is an existing body of literature that considers depression in a utility-based context (see for example, Bennett et al., 2000; Revicki and Wood, 1998). This work posits that there are two possible pathways from gambling addiction to depression: i) the direct effect of the realisation/recognition of the irrational consumption of gambling may in part result in negative utility and hence depression, or ii) the indirect effect of the maladaptive behaviours as captured by the harms and consequences of excessive gambling on utility may foster depression. Based on these arguments, we formulate the following hypotheses:

H1. Gambling addiction leads to depression.

H2. The effects of gambling on depression can be measured by looking at the relationship between levels of gambling addiction and depression, in a population-based study.

Further, given that poor mental health is impacted by poor social interaction and addiction may be environmentally determined, we look at the impact on depression of venue-based versus online gambling. We argue that, the more social interaction the gambling offers, the lower will be the impact of the gambling behaviour on depression; and, conversely, the lower the level of social engagement, the greater will be the impact on depression. The potential to become addicted may also be a function of the environment in which the gambling takes place. Thus, we hypothesise that:

H3. Online gambling poses a greater mental health risk than gambling in venues or outlets.

3. Data

Our data is a derived dataset which we shall refer to as the 2012 Gambling in England and Scotland survey. This is a combined dataset

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