



Economic Assessment of Selected House of Lords Gambling Reforms

Prepared for the Peers for Gambling Reform

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Contents

Executive Summary	i
Brief Summary and Conclusions	i
Introduction	ii
Background and Scope of our Report	ii
Methodology	iii
Modelling Results	iv
Conclusions	vi
1. Introduction	1
2. Background	4
2.1. Background and Recent History of the British Gambling Sector	4
2.2. Summary of Relevant Literature	7
3. Direct Effects of Selected Reforms	11
3.1. Structural limits for online gaming	11
3.2. Affordability checks	16
3.3. Mandatory levy	19
3.4. Loot boxes	20
3.5. Ban on direct sponsorship	22
4. Quantified Results	27
4.1. Effects on Gambling Sector	27
4.2. Effects on Wider Economy	31
4.3. Effects on the NHS and the Economy from Gambling Harm	38
5. Conclusion	41
Appendix A. Detailed Modelling Assumptions	42
A.1. Maximum Stake	42
A.2. Affordability Checks GGY Reduction	45
A.3. Correlation of operating costs and online GGY	50

Executive Summary

Brief Summary and Conclusions

We have conducted an economic assessment of a range of recommendations for reform to the UK Gambling Sector proposed by the House of Lords Select Committee on the Social and Economic Impact of the Gambling Industry. The recommendations include: (i) structural limits on online stake sizes and play speed; (ii) affordability checks for online play; (iii) the introduction of a Mandatory Levy for gambling operators; (iv) the classification of video game loot boxes as gambling; and (v) a ban on direct sponsorship by gambling operators.

In addition to any impact fulfilling their stated purpose of reducing the incidence of gambling harm, these reforms are likely to have economic effects on (i) the gambling industry; (ii) selected sport leagues and teams (English Football League and Rugby Football League); (iii) employment and earnings in the wider economy; (iv) the revenue balance of the Exchequer; and (v) other fiscal expenditure.

- i. We estimate that **the impact of the reforms on the profitability of the gambling industry is between £696 million and £974 million annually**. Our review of the financial reporting of the gambling industry suggests that industry profits are likely to exceed these financial costs, without taking into account any increase in prices or change in strategy that operators could implement in response.
- ii. With respect to the selected sport leagues, we find that sponsorship from gambling operators does not make up a large component of their revenue streams, particularly in lower tiers of football where viewership is low enough that gambling operators apparently do not see value in jersey sponsorships. There is potential for at least partial replacement from non-gambling sponsorship, which many teams already obtain. We estimate that the **English Football league could lose £26 million and the Rugby Football league could lose £500,000-950,000 in annual sponsorship revenue**, equal to 2.5 per cent and 2-4 per cent of annual revenues, respectively.
- iii. The reduction in revenues to gambling operators from these reforms might reduce employment in the gambling industry. However, diverting expenditure by the public to other sectors which are more labour intensive than the gambling sector could **create up to 30,000 new jobs, and employee earnings could increase by up to £400 million**.
- iv. We estimate that there would be a **net increase of £68-£87 million in tax revenues**, and therefore no net loss to the Exchequer from the proposed reforms. On the contrary, **£68-£87 million would be available for new research, education and treatment of gambling-related harm (RET)**, as recommended in the Select Committee report.
- v. **We estimate that Government spends £270-£1,170 million in additional costs on individuals who experience gambling-related harm**, primarily through healthcare costs. It may be possible to reduce those additional costs through the recommended reforms and an effective RET programme, though it is not possible to say precisely how much could be saved on the basis of the evidence we have reviewed.

Introduction

In July 2020, the House of Lords Select Committee on the Social and Economic Impact of the Gambling Industry (the “Select Committee”) released its final report culminating a year-long wide-reaching investigation into the gambling sector (the “Committee Report”).¹

On 8 December 2020, the Department for Digital, Culture, Media and Sport (DCMS) launched a review of the Gambling Act 2005 and call-for-evidence.

Against this background, we have been commissioned by the PGR to conduct an economic assessment of the reforms recommended in the Committee Report which are most likely to have a substantial economic impact on the gambling industry. These reforms are:

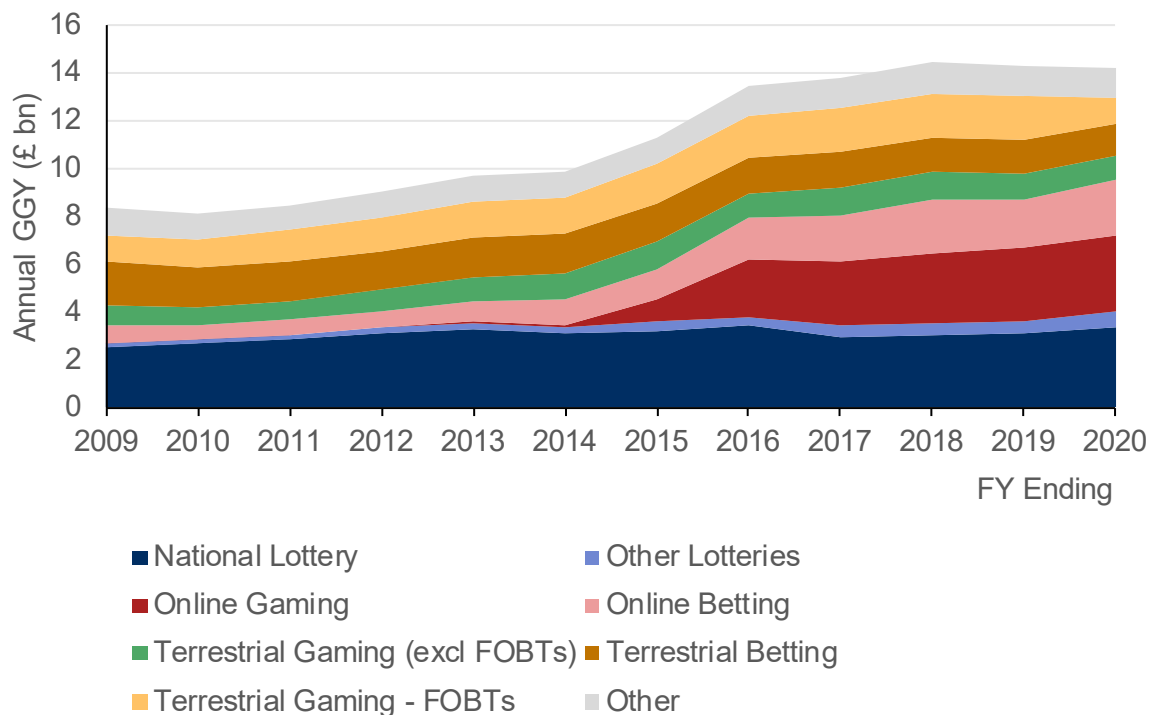
- **Structural limits for online gaming**, in particular stake limits for online gaming products and an equalisation of play speed to terrestrial equivalents.
- **Affordability checks**, in which gambling operators would have a responsibility to ensure that players did not gamble more than they could afford.
- A **Mandatory Levy** to fund research, education and treatment (RET) of gambling-related harm, with potentially more harmful gambling products incurring a higher rate.
- Classification of video game **loot boxes** as gambling.
- **Ban on direct sponsorship** of sport by gambling operators, including on kit or in or near sports venues.

Throughout this report, we base our analysis upon the most reliable data available to us. In many cases, especially for data specific to the gambling industry, the data sources are few and far between, and may be based on incomplete samples. Where better data exists in house with gambling operators, this has not been shared with us, and so we cannot rely upon it. This qualification also underscores the need for greater independent research into gambling-related harm, funded by the Mandatory Levy.

Background and Scope of our Report

The licensed British gambling industry today earns around £14 billion annually, measured in terms of Gross Gambling Yield (GGY) – that is total stakes less prizes paid or payable. As Figure 1 shows, online gambling is increasingly prevalent as a driver of industry-wide GGY, though its growth in the Figure is distorted by a change of regulations in 2014 that required online gambling operators to hold a licence with the Gambling Commission.

¹ House of Lords Select Committee on the Social and Economic Impact of the Gambling Industry (2 July 2020), Gambling Harm – Time For Action.

Figure 1: GB Licensed Gambling Industry GGY by Segment (£ bn)

Source: Gambling Commission

The online segments have been subject to comparatively less scrutiny than their terrestrial equivalents. For example, there is no maximum stake that can be placed on a single draw of an online slot machine, while terrestrial equivalents have a maximum stake of £2 or £5, depending on the type of machine and its location.

While not the only marker or consequence of gambling harm, gambling harm is associated with high expenditure on gambling, and so measures that effectively mitigate the risk of gambling harm will also have a substantial economic effect to the gambling sector and the economy beyond it. The focus of our report is therefore to quantify the potential economic effects of the selected reforms on the gambling industry, on selected sport leagues and on macroeconomic outcomes such as tax revenue and employment. We also consider wider economic and social benefits from the reduction of gambling harm, although these are difficult to quantify with any certainty.

Methodology

Our overall approach is as follows:

- We identify a set of hypothetical direct effects on GGY, costs and tax liability from each of the reforms.
- We model the impact of those direct effects on the financial health of the gambling industry and selected sport leagues and clubs based on a simplified profit and loss model for the industry for a representative year.

- We model the subsequent macroeconomic effects of revenue substitution away from gambling into related sectors of the economy using a simplified approach based on input-output tables published in national accounts.

Because of the inherent uncertainty around many of our modelling assumptions, we define three scenarios: a “Low Impact” scenario (in terms of the reforms’ impact on the gambling sector); a “Medium Impact” scenario; and a “High Impact” scenario.

These scenarios do not describe the full range of possible outcomes, but rather provide an indication of what the economic effects of the proposed reforms could be under a range of plausible input assumptions.

In all scenarios, we assume that a Mandatory Levy is imposed on gambling operators that will recover £150 million per annum across the sector, or roughly 1 per cent of current GGY. We assume that this will be levied on a “polluter pays”-basis, in which potentially more harmful products pay a higher rate. Revenue from the Mandatory Levy would be used to fund a new Gambling Ombudsman and new Research, Education and Treatment of gambling-related harm.

Modelling Results

We summarise the results of our economic analysis below. We consider the reforms’ effect on (i) the gambling industry; (ii) selected sports leagues and teams; (iii) jobs and earnings; and (iv) taxes and other fiscal effects.

The gambling industry

We estimate that the set of reforms would reduce the post-tax profits of the gambling sector by £696 million (Low Impact), £819 million (Medium Impact), and £974 million (High Impact) in a typical year post-reform, in real 2020 GBP.

For scale, 2019 post-tax profits for GVC (which owns Ladbrokes), Flutter (which owns Paddy Power Betfair), Bet365, William Hill and Camelot (which operates the National Lottery) were £697 million. This total does not include: (i) profits earned by the rest of the industry, which we were unable to obtain; and (ii) the £277 million salary earned by the CEO and majority shareholder of Bet365, which is technically counted as an operating cost to the company (this increased to £421 million in 2020).² This suggests that the industry profits are likely to be larger than the financial costs we model.

The vast majority of the change in industry profits is specific to online gambling, due to the loss in online gambling GGY offset partially by reductions in RGD and operating cost. The GGY reduction in online gambling is 27 to 39 per cent of the online sector’s total GGY.

A 2018 study on gambling-related harm in UK online gambling by ResPublica found that 24 per cent of the online sector’s revenue came from “problem gamblers” and a further 17 per cent from medium-risk gamblers.³ Therefore, our estimated GGY reductions are broadly

² Casino.org (18 December 2019), Bet365 CEO Denise Coates Ruffles Feathers, Pays Herself \$422 Million in 2019. Accessed 23 April 2021. URL: <https://www.casino.org/news/bet365-ceo-denise-coates-pays-herself-423-million-in-2019/>

³ ResPublica (August 2018), Online Gambling: Addicted to Addiction, p.12.

consistent with a mechanism that prevented all and only high- or medium-risk gambling activity.

Selected sport leagues

We estimate that the English Football League could lose £26 million in annual revenue, around 2.5 per cent of its total revenue.⁴ £20 million of this revenue loss comes from the loss of Sky Bet's £40 million sponsorship of the whole league, with the remaining £6 million coming from the 12 teams in the EFL Championship which have a gambling sponsor on their jerseys. No team in the lower EFL leagues (League One and League Two) have a gambling jersey.

We do not consider revenue losses to the Premier League, on the basis that (a) non-gambling sponsors are generally willing to pay as much for the global reach of a Premier League jersey as a gambling sponsor; and (b) Premier League clubs derive a greater proportion of their revenue from broadcast rights and less from sponsorship revenue.

No Rugby Football League team currently has a gambling sponsor on its jersey, but Betfred has a naming sponsorship deal with RFL worth between £1 million and £1.9 million. We therefore estimate that RFL could lose between £500,000 and £950,000 in sponsorship revenue, or 2-4 per cent of its total revenue.

In short, we estimate that the expected impact on selected sport leagues will be 2.5 per cent (English Football League) and 2-4 per cent (Rugby Football League) of total annual revenues.

Jobs and earnings

We estimate that the reforms could add 20-30 thousand jobs and increase total employee earnings (i.e. wages and salaries) by £276-£399 million.

This positive effect occurs because the gambling sector employs fewer people and pays them less per unit of expenditure than any of the four industries that expenditure diverts to. In fact, of 105 industries listed in the National Accounts, the gambling sector ranks 76th in terms of employee earnings per unit of expenditure in 2018. The two largest comparator sectors, Retail and Food/Beverage, rank 22nd and 18th, respectively.

We note also that employment in the gambling sector is probably concentrated on terrestrial activities – casino croupiers and dealers, LBO staff, etc – while the revenue reductions we model are exclusively online. Therefore, the job and wage losses in the gambling sector may be lower than those that we model and the net impact of the reforms on jobs could be greater.

Taxes and other fiscal effects

We estimate that the reforms could increase general tax revenue by £68-£87 million annually. This reflects the balance of (i) a net reduction in consumption-based tax receipts (betting duty and VAT) of *minus* £138-£199 million; (ii) a net increase in corporate income tax receipts of £40-£58 million; (iii) a net increase in individual income tax receipts (i.e. from the increase in earnings described above) of £55-80 million; and (iv) the remaining revenue from the

⁴ Based on advice provided by Kieran Maguire, a lecturer in football finance at the University of Liverpool and author of the book *The Price of Football*.

Mandatory Levy of £130 million, once the cost of the new Gambling Ombudsman is deducted.

Our estimates do not include any expenditure on Research, Education and Treatment of gambling-related harm (RET), which is recommended by the Committee Report. The exact level of RET expenditure is a choice for Government.⁵ We estimate that it could dedicate £68-£87 million to RET annually, while still maintaining the revenue neutrality of the Exchequer. This would be a substantial increase on the existing expenditure (£19 million funded through voluntary contributions from the industry), but fall short of the £106.5 million needed which we estimate would bring gambling treatment on par with treatment of drug and alcohol addiction. Government could of course achieve this level of expenditure if it chose to, but at a loss to the Exchequer of £20-£38 million.

Additionally, if the proposed reforms are successful in reducing the incidence of gambling harm, Government could achieve further savings in reduced expenditure associated with gambling harm. On behalf of GambleAware, the Institute for Public Policy Research estimates an excess fiscal cost associated with these individuals of between £270 million and £1,170 million annually. If the assessed reforms are effective in reducing harmful gambling activity, some of these excess fiscal costs could be reduced. These savings may be more likely to occur through a more robust RET programme, with an increased standard of treatment for gambling harm.

Conclusions

Based on our analysis, we reach the following conclusions:

- The gambling industry could lose between £696 million and £974 million as a result of the proposed reforms, but industry profits are most likely higher than this at present.
- The sport leagues and teams we have assessed are unlikely to be significantly harmed by a ban on direct sponsorship, as gambling sponsorship revenue is a small revenue source relative to the total, and non-gambling sponsors exist to fill any gap created.
- The economy could add up to 30,000 new jobs and £400 million in employee earnings as revenue is diverted to more labour intensive industries.
- The Exchequer could be revenue neutral, while still substantially increasing expenditure on Research, Education and Treatment of gambling-related harm.
- Government could achieve further fiscal savings in healthcare, unemployment, homelessness and incarceration costs if the reforms are successful in reducing the prevalence of gambling-related harm.

⁵ Note, we use Government as a catch-all term for all elements of Her Majesty's Government, excluding the specific role that DCMS has in the context of gambling. References to Government in this report could more specifically apply to HM Treasury, HM Revenue & Customs or the Cabinet, but we do not distinguish.

1. Introduction

On 13 June 2019, the House of Lords created a Special Inquiry Committee to examine the social and economic impact of the gambling industry. Following a year's worth of investigation across a wide range of topics in the gambling industry, the Committee released its findings in a July 2020 final report, "Gambling Harm – Time for Action", henceforth referred to as the "Committee Report".⁶

The report contains 63 recommendations for reforms to the sector, ranging from funding of the Gambling Commission to a ban on gambling operators advertising on the kits of sports teams.

Following the release of Committee's report, the all-party Peers for Gambling Reform (PGR) was created with the purpose of implementing the recommendations contained in the Committee Report.

On 8 December 2020, the Department for Digital, Culture, Media and Sport (DCMS) launched a review of the Gambling Act 2005 to ensure that "people can continue to gamble but that the legislation and regulation we have in place addresses as many factors as possible to give the necessary safeguards to protect children, vulnerable people, and all gamblers in the digital age".⁷ The announcement also included a 16-week window to submit evidence across 45 open-ended questions, closing on 31 March 2021.

Against this background, we have been commissioned by the PGR to conduct an economic assessment of the reforms recommended in the Committee Report which are most likely to have a substantial economic impact on the gambling industry. Funding for this report has been provided by Derek Webb, a benefactor of PGR. The identified recommendations are as follows:

- Structural limits for online gaming:
 - Government and the Gambling Commission should "set stake limits for online gambling products. [...] We recommend the equalisation of speed of play and spin, so that no game can be played quicker online than in a casino, betting shop or bingo hall".⁸
- Mandatory affordability checks:
 - "The Gambling Commission must amend its Formal Guidance for Remote Gambling Operators to define the minimum steps which operators should take when considering customer affordability, and to make clear that it is for the operator to take those steps, and any necessary additional steps, which will enable them to identify customers who are betting more than they can afford".⁹

⁶ House of Lords Select Committee on the Social and Economic Impact of the Gambling Industry (2 July 2020), Gambling Harm – Time For Action.

⁷ Department for Digital, Culture, Media and Sport (8 December 2020), Policy paper – Review of the Gambling Act 2005 Terms of Reference and Call for Evidence, para. 4.

⁸ Committee Report, paras. 186 & 193

⁹ Committee Report, para. 326.

- Introduction of a Mandatory Levy to fund gambling treatment:
 - The Government should require licensed gambling operators “to pay to the Gambling Commission an annual levy sufficient to fund research, education, and treatment, including treatment provided by the NHS”.¹⁰
 - “DCMS officials should devise a formula requiring companies offering potentially more harmful gambling products to pay a correspondingly higher proportion of the levy.”¹¹
- Classification of loot boxes as gambling:
 - The Government should “make regulations under [...] the Gambling Act 2005 specifying that loot boxes and any other similar games are games of chance”, and hence considered to be a form of gambling.¹²
- Ban on direct sponsorship of sport
 - “Gambling operators should no longer be allowed to advertise on the shirts of sports teams or any other part of their kit. There should be no gambling advertising in or near any sports grounds or sports venues, including sports programmes”. This does not include horseracing or greyhound racing.¹³

In assessing each of the above recommendations, we make a set of “what if” assumptions on the direct effect of each policy on gambling operators’ revenues, costs or tax liability. We then focus on the wider economic impact of the reforms to the gambling industry, the sport industry, the Exchequer and the macroeconomy.

This report proceeds as follows:

- In Chapter 2, we set out the background of our analysis, including a more detailed description of each of the reforms we assess;
- In Chapter 3, we describe our assessment methodology, particularly our assumptions for how we estimate the direct impacts of each reform, and also estimate the impact on sport from the ban on direct sponsorship;
- In Chapter 4, we present our estimates of the economic effects of the reforms on the gambling industry and the wider economy; and
- In Chapter 5, we conclude.

Throughout this report, we base our analysis upon the most reliable data available to us. In many cases, especially for data specific to the gambling industry, the data sources are few and far between, and may be based on incomplete samples. Where better data exists in house with gambling operators, this has not been shared with us, and so we cannot rely upon it. This qualification also underscores the need for greater independent research into gambling-related harm, funded by the Mandatory Levy.

¹⁰ Committee Report, para. 557.

¹¹ Committee Report, para. 560.

¹² Committee Report, para. 446.

¹³ Committee Report, paras. 524-526.

2. Background

In this chapter we set out the background relevant to our analysis. This chapter proceeds as follows:

- In Section 2.1, we set out the policy context to the current review of the Gambling Act 2005; and
- In Section 2.2, we briefly summarise the literature we rely upon in our analysis.

2.1. Background and Recent History of the British Gambling Sector

2.1.1. Gambling in Great Britain today

As reported by the Gambling Commission’s most recent Industry Statistics, the British gambling sector in FY 2019-20 earned £14,224 million in Gross Gambling Yield (GGY) – that is, total stakes less prizes paid or payable.¹⁴ Gambling activity can be divided into several categories:

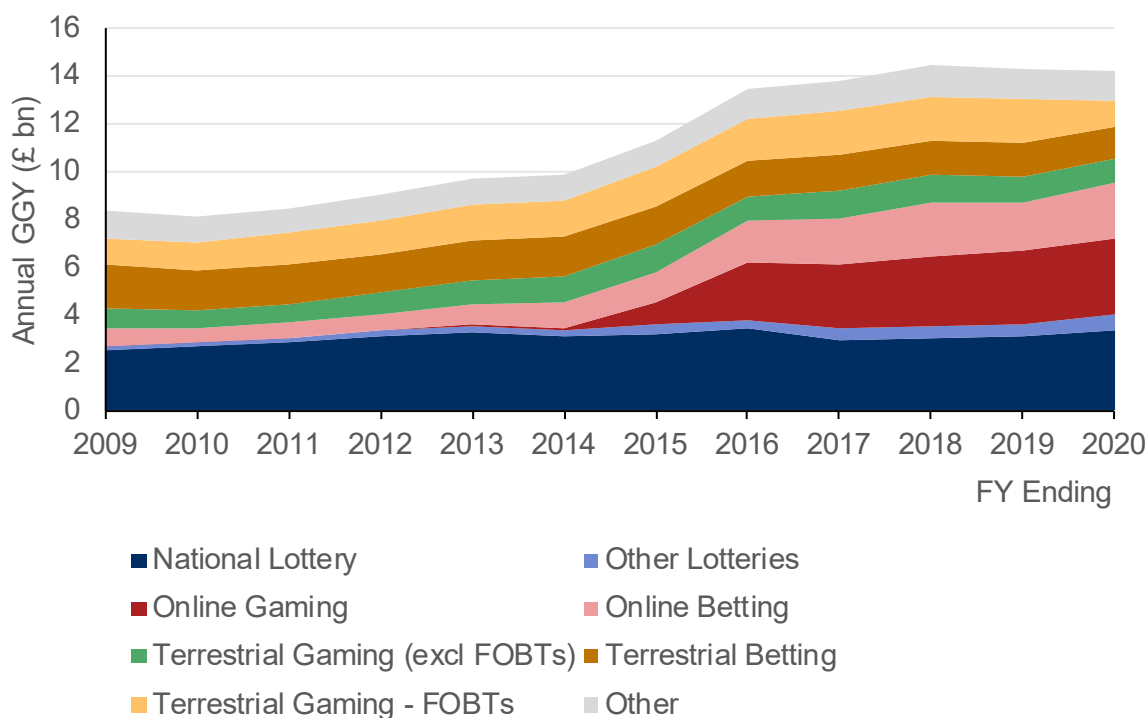
- Lotteries, mainly The National Lottery, but also smaller “society lotteries”. In Great Britain, lotteries must be run for the benefit of good causes, so a proportion of gross gambling yield is diverting to assorted charitable causes.
- Betting, i.e. placing a stake on the outcome of a race, competition, event, etc. Most notably, this includes bets placed on races and sport events.
- Gaming, i.e. playing a game of chance for a prize of money or money’s worth. This includes table games played at a casino (e.g. blackjack or roulette), slot machines, bingo and video-based equivalents of these.

The Gambling Commission separately collects and reports GGY data for online and terrestrial versions of each of these, as well as the type of business offering them. In Figure 2.1, we show the evolution of the GGY of each of these categories, split between online and terrestrial GGY.¹⁵

While technically a type of terrestrial gaming, we separately list the GGY from Fixed Odds Betting Terminals (FOBTs), which are video gaming machines located in the premises of Licenced Betting Operators (LBOs). LBOs are traditionally the site of terrestrial *betting* activity, but in more recent years became more heavily dependent on FOBT revenues. The reduction in the maximum stake on FOBTs from £100 to £2 in April 2019 has shrunk this revenue line.

¹⁴ Gambling Commission (November 2020), Industry Statistics

¹⁵ Note: the Industry Statistics do not distinguish between online and terrestrial lottery ticket sales.

Figure 2.1: GB Licensed Gambling Industry GGY by Segment (£ bn)

Source: Gambling Commission

2.1.2. The growth of online gambling in Great Britain

As Figure 2.1 shows, industrywide GGY has grown by around 40 per cent since 2013-14, driven almost entirely by the implementation of the Gambling (Licensing and Advertising) Act 2014, which required online gambling operators to hold a licence with the Gambling Commission. Before 2014, the Industry Statistics omitted a large segment of legal gambling activity – since then, all legal gambling activity is captured in the Industry Statistics.

Considering just the period since the implementation of the Gambling (Licensing and Advertising) Act 2014, online GGY grew from £4.2 billion in 2015-16 to £5.7 billion in 2019-20. By contrast, all other gambling segments *shrank* from £9.2 billion to £8.5 billion.

In 2019-20, online gambling (excluding online lottery tickets) represented 40 per cent of the industry GGY, and online *gaming* was the second largest individual segment, marginally smaller than all tickets, scratchcards and instant win games sold by The National Lottery.

The online segments have been subject to comparatively less scrutiny than their terrestrial equivalents – for example, there is no maximum stake that can be placed on a single draw of an online slot machine, while terrestrial equivalents have a maximum stake of £2 or £5, depending on the type of machine and its location.¹⁶

¹⁶ <https://www.gamblingcommission.gov.uk/for-gambling-businesses/Compliance/Sector-specific-compliance/Arcades-and-machines/Gaming-machine-categories/B1-gaming-machines.aspx>

2.1.3. The prevalence of harmful gambling in Great Britain

The Committee Report highlights a range of evidence around the prevalence of gambling-related harm in Great Britain. According to the Government's written submission to the Select Committee, approximately 340,000 individuals, or 0.7 per cent of the adult population of Great Britain experience gambling-related harm.¹⁷

Incidence of harmful gambling is higher amongst younger players – 2.0 per cent of boys between 11-16 (too young to gamble legally) are classified as such – and among poorer segments of society – homeless individuals and prison inmates are 10-24 times as likely to experience gambling-related harm than the general population.¹⁸

Because one of the characteristics (but not the only one) of harmful gambling is high expenditure, gambling operators derive a disproportionate share of their revenue from gamblers who experience gambling harm. According to the think tank ResPublica and cited in the Committee Report, 24 per cent of the online gambling industry's profits derived from 0.8 per cent of the UK population it classifies as "problem gamblers". A further 17 per cent comes from the 1.0 per cent of the UK population it classifies as "moderate risk gamblers".¹⁹

2.1.4. A pathway to reform

Against the backdrop of both the growth of the online gambling sector as well as a renewed focus on gambling harm, the House of Lords established a Special Inquiry Committee (the "Select Committee") in June 2019 to examine the social and economic impact of the gambling industry, and released its findings in the Committee Report of June 2020.

Simultaneously with the development of the Committee Report, the All Party Parliamentary Group (APPG) on Gambling Related Harm has considered many of the same challenges, culminating with a report also released in June 2020.²⁰ The APPG comprises ten committee members across both Houses of Parliament, including Lord Foster of Bath, a member of the Select Committee and chair of PGR.

In December 2020, DCMS launched its review of the Gambling Act 2005 covering many of the challenges raised in the Committee Report, with a call-for-evidence closing on 31 March 2021. There is no published timetable for completed this process and implementing any changes to primary or secondary legislation.

As a separate avenue of consultation, in January 2021, DCMS launched a consultation on changes to fees paid by gambling operators to cover the Gambling Commission's cost of regulating the gambling industry.²¹

¹⁷ Committee Report, para. 264.

¹⁸ Committee Report, paras. 266 and 268.

¹⁹ ResPublica (August 2018), Online Gambling: Addicted to Addiction, p.12.

²⁰ APPG (June 2020), Report from the Gambling Related Harm All-Party Parliamentary Group

²¹ DCMS (29 January 2021), Proposals for Changes to Gambling Commission fees from 1 October 2021.

2.2. Summary of Relevant Literature

Throughout the analysis portion of this report, we rely repeatedly on several other research pieces conducted by the gambling industry, the Gambling Commission, social research groups and academics. In this section, we briefly summarise each of these studies. We provide a more detailed description of how we use each source as and when we use them.

2.2.1. Policy Documents

Throughout this report, we rely extensively on the evidence collected by the House of Lords and presented in the Committee Report. Where appropriate, we also refer to the final report of the APPG.

2.2.2. GambleAware / NatCen research

Forrest and McHale (2018)

Professors David Forrest and Ian McHale released their “Analysis of Play Among British Online Gamblers on Slots and Other Casino-Style Games” in March 2018, commissioned by GambleAware. Forrest and McHale collected patterns of play from thirteen “large, mainstream operators” in the month of January 2017, though the operators are not individually named.²² Each operator provided the authors with distributions of:

- Stake size by individual spin, divided into slots and non-slots, and aggregated into bins (e.g. £1.01 to £2).
- Monthly net expenditure by account (i.e. wins minus losses), divided into slots and non-slots, and aggregated into bins (e.g. -£100.01 to -£200).
- The frequency within the month that each player played slots or non-slots (e.g. 73,415 players played slots for exactly 4 days in January 2017).

We rely upon the first two of these distributions when estimating the revenue effects from stake size limits and affordability checks. Two of the thirteen operators provided distributions categorised under different bin amounts, and hence were excluded from the distributions.

All subsequent references to “Forrest and McHale” refer to this report, rather than the NatCen report below which was also authored by them.

NatCen Social Research (2021)

NatCen Social Research released an interim report entitled “Exploring Online Patterns of Play” in March 2021, commissioned by GambleAware and authored by Professors Forrest and McHale.²³ The report provides patterns of play for a random sampling of 139,152 player accounts across seven major online operators (not named), based on play between July 2018 and June 2019. We understand that NatCen intends to conduct follow-on research and release a final report in early 2022.

²² Forrest, D and McHale, I (March 2018), Analysis of Play Among British Online Gamblers on Slots and Other Casino-Style Games, p.3

²³ NatCen Social Research (March 2021), Exploring Online Patterns of Play – Interim Report

The report summarises a range of play patterns across sports betting and casino gaming activity, and identifies the prevalence of various markers of gambling harm. While this report does not provide the types of distributions that Forrest and McHale (2018), it nonetheless serves as a useful cross-check with more recent data, and to apply those distributions to sports betting.

2.2.3. Gambling industry data

Gambling Commission Industry Statistics

The Gambling Commission releases its Industry Statistics twice per year. The Industry Statistics present, among other items, annual industry-wide turnover and GGY by location type (e.g. casino, licenced betting office, online) and play type (e.g. online blackjack, over-the-counter horse racing bets, etc.). We rely upon data covering FY 2019-20, released as part of the November 2020 Industry Statistics.²⁴

Gambling Commission machines data

As part of an ad hoc review in 2017, the Gambling Commission collected data from gaming machines located in licenced betting offices, adult gaming centres and bingo venues. The data shows distributions of patterns of play by session, such stake size, session length and net expenditure.²⁵

We do not use this data directly because it relates to terrestrial play only, but it serves as a useful cross check for patterns of play for online slots.

Gambling business data during Covid-19

The Gambling Commission has collected and produced data on online gambling activity by month since the beginning of Covid-19.²⁶ The data presents the total number of bets placed and associated GGY from seven different online gambling activities: slots; other gaming excluding poker; betting on real events; betting on eSports; virtual betting; poker; and other.

Gambling operator annual reports

In order to assess the relationship between turnover/GGY and costs, we rely upon recent annual reports or accounts of four of the largest online gambling operators in the UK: William Hill; Flutter (better known as Paddy Power Betfair); GVC Holdings (the owner of Ladbrokes Coral, and recently rebranded as Entain); and bet365.²⁷

²⁴ Gambling Commission (November 2020), Industry Statistics

²⁵ <https://www.gamblingcommission.gov.uk/news-action-and-statistics/Statistics-and-research/Statistics/Cross-venue-machines-data.aspx>

²⁶ <https://www.gamblingcommission.gov.uk/news-action-and-statistics/Statistics-and-research/Covid-19-research/Covid-19-updated-February/Gambling-business-data-on-gambling-during-Covid-19-updated-February-2021.aspx>

²⁷ [1] William Hill PLC (26 February 2020), Final results 2019; [2] Flutter Entertainment plc (2020), 2019 Annual Report & Accounts; [3] GVC Holdings pls (2020) For the Good of Entertainment – Annual Report 2019; [4] bet365 Group Limited (31 March 2019), Report and Financial Statements; [5] bet365 Group Limited (25 March 2018), Report and Financial Statements

2.2.4. Macroeconomic sources

ONS disposable income data

The Office for National Statistics (ONS) publishes annual distributional data on average household equivalised disposable income. Disposable income excludes direct taxes (including council tax), but includes all other costs such as rent. Equivalisation is the process of dividing by a measure of household size. The first adult in a household counts as 1; each subsequent adult at least 14 years in age counts as 0.5; each child under 14 counts as 0.3.²⁸

We use this data to measure the distribution of income which can be spent on gambling activities, in assessing the revenue impact of affordability checks (discussed in Section 3.2).

ONS input-output supply and use tables

As part of its “Blue Book” of UK National Accounts, the ONS publishes annual data on inputs (including employment) and outputs across the Standard Industrial Classification (SIC) industries, including “Gambling and Betting Activities”.²⁹

We use the 2018 data table (the most recent available) on industries’ intermediate consumption to estimate potential macroeconomic effects from a reduction and diversion of gambling sector revenue into other industries.

ONS employment data

Across the SIC industries, the ONS also publishes data on employment totals by industry and quarter. We use 2019 averages to estimate potential changes to employment across industries resulting from a reduction and diversion of gambling sector revenue into other industries.

University of Loughborough / Joseph Rowntree Foundation Minimum Income Standard

Researchers at the University of Loughborough and funded by the Joseph Rowntree Foundation produce the Minimum Income Standard (MIS). The MIS sets out “the income that people need in order to reach a minimum socially acceptable standard of living in the UK today, based on what members of the public think”.³⁰ In addition to true necessities like food, shelter and clothing, the MIS includes “what you need in order to have the opportunities and choices necessary to participate in society”, like travel costs, cultural participation and household goods.³¹

We use the MIS to estimate the proportion of disposable income (excluding council tax) that an individual could reasonably spend on gambling activities in a month.

²⁸ ONS (21 January 2021), Average household income, UK: financial year 2020. Link: [https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/bulletins/householddisposableincomeandinequality/financialyear2020#:~:text=In%20financial%20year%20ending%20\(FYE,\(ONS\)%20Household%20Finances%20Survey.](https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/bulletins/householddisposableincomeandinequality/financialyear2020#:~:text=In%20financial%20year%20ending%20(FYE,(ONS)%20Household%20Finances%20Survey.)

²⁹ ONS (October 2020), Supply and Use Tables, 1997-2018. Link: <https://www.ons.gov.uk/economy/nationalaccounts/supplyandusetables/datasets/inputoutputsupplyandusetables>

³⁰ Joseph Rowntree Foundation (July 2020), A Minimum Income Standard for the United Kingdom in 2020, p.4.

³¹ Joseph Rowntree Foundation (July 2020), A Minimum Income Standard for the United Kingdom in 2020, p.4 & 12.

2.2.5. Sources directly related to ongoing review

Social Market Foundation Gambling Review and Reform (2020)

Following the publication of the Committee Report, the Social Market Foundation (SMF), a think tank focussing on economic and social fields, released a report further developing some of the recommendations of the Committee Report.³² These recommendations include reforms outside of the scope of this report, but also include those relating to maximum stakes and affordability checks.

We rely on this report to further clarify what an affordability check could look like in practice.

Philip Newall et al (2021)

Dr Philip Newall et al conducted an experiment of the effect of minimum speed of play in UK online roulette, in which UK gamblers were invited to play an online roulette game designed to look and feel like a typical online roulette game, and with real money at stake. One set of players were allowed to play at the natural speed of the game, while the other set were allowed only to spin once every 60 seconds.³³

We rely heavily on this research to define our assumptions regarding the revenue effect of placing a maximum play speed on online table games.

We understand that Dr Newall's report is being submitted as a separate response to DCMS's Call for Evidence.

Naomi Muggleton et al (2021)

Dr Naomi Muggleton analyses detailed, anonymous individual-level financial transactions from 6.5 million UK customers of Lloyds Banking Group.³⁴ Dr Muggleton correlates each customer's volume of gambling-related transactions with various markers of financial, lifestyle and well-being outcomes (e.g. the customers with the highest amount of gambling activity are most likely to take out a payday loan, and spend the least amount on education).

We do not directly rely upon Dr Muggleton's work in this report, but note its contribution to the understanding of gambling harm.

³² Social Market Foundation (August 2020), Gambling review and reform – Towards a new regulatory framework.

³³ Newall, P.W.S., Weiss-Cohen, L., Singmann, H., Boyce, W.P., Walasek, L., & Rockloff, M.J. (2021). A speed-of-play limit reduces gambling expenditure in an online roulette game.

³⁴ Muggleton, N et al (January 2021), The association between gambling and financial, social and health outcomes in big financial data.

3. Direct Effects of Selected Reforms

Our overall approach to the economic assessment is as follows:

- We identify a set of hypothetical direct effects from each of the reforms, in terms of their effects on GGY, costs, and tax liability. In some cases, the reforms may also have a direct effect on costs of regulation, or on the sport sector.
- We model the effects on the financial health of the gambling industry and selected sport leagues and clubs in a hypothetical steady-state year in the future after the reforms have been fully implemented.
- We model the subsequent macroeconomic effects of revenue substitution away from gambling into related sectors of the economy.

In this chapter, we derive the first order effects for each of the reforms.

The Committee Report is based on extensive and broad-reaching research, and its 63 recommendations cover most aspects of the UK gambling sector, but they are mostly non-prescriptive. Moreover, DCMS is still in the early phases of its review of the Gambling Act 2005, and each of its areas of focus will certainly evolve over the course of various consultations.

Therefore, in order to conduct an economic assessment of the reforms in question, we must add some detail beyond what is included within the Committee Report. We set out our interpretation of each reform in each of the subsections below, based in part on advice from PGR and on our own external research.

Because of the inherent uncertainty around many of our modelling assumptions, we define three scenarios: a “Low Impact” scenario (in terms of the reforms’ impact on the gambling sector); a “Medium Impact” scenario; and a “High Impact” scenario.

These scenarios do not describe the full range of possible outcomes, but rather provide an indication of what the economic effects of the proposed reforms could be under a range of plausible input assumptions.

3.1. Structural limits for online gaming

The Committee Report recommends that “Government and the Gambling Commission should [...] set stake limits for online gambling products” and that there should be an “equalisation of speed of play and spin, so that no game can be played quicker online than in a casino, betting shop or bingo hall”.³⁵ Whilst these are two separate recommendations, they both consider the structural design of online casino games (e.g. slots, roulette, blackjack), and so we treat them together.

The recommendations do not specify what the maximum stake or speed should actually be. As we derive below, we assume that there will be a maximum stake of £1, £2 or £5 on online slots, and a maximum play speed of 2.5 seconds on slots and 60 seconds on table games.

³⁵ Committee Report, paras. 186 & 193

3.1.1. Limits on stake size

We assume that maximum stake for online slots will be set to £5 (Low Impact); £2 (Medium Impact); and £1 (High Impact). For comparison, machines in a terrestrial casino have a maximum stake of £5, and those in betting shops have a maximum stake of £2. We do not model maximum stakes for other casino games.

The SMF Gambling Review and Reform report sets out the case for each of these levels of maximum stake, concluding that “to propose a limit that is either lower than £1 or higher than £5 would be to ignore [...] today’s political and regulatory reality”.³⁶ In particular:

- The Gambling Commission’s interim report on industry challenges finds broad support in a GamCare Forum Survey for maximum slots stakes to be set to £1, with options of £2 and £5 also considered.³⁷
- The APPG Report recommends that a £2 maximum stake should be implemented on online slot content.³⁸
- The APPG Report makes no mention of maximum stakes on non-slot content (e.g. roulette), and SMF recommends that “instead of a fixed limit on online non-slot content, a more nuanced assessment of the relationship and ratio between stakes, speed and prizes should be made”.³⁹

We summarise our approach to estimating the GGY reduction resulting from these new limits below, with more detail provided in Appendix A.1:

1. First, we take Forrest and McHale’s distributions of individual slot stakes by stake level, based on all online play for 11 major operators in January 2017. For example, we can see that 33 per cent of stakes were £0.25 or below, 29 per cent were between £0.26 and £0.50, 21 per cent were between £0.51 and £1.00, and so forth.⁴⁰
2. For each stake bin, we assume that all stakes were placed at a single point, based on the relative sizes of the neighbouring bins. For instance, we assume that all stakes between £0.26 and £0.50 were exactly £0.35, closer to the lower bound because more players staked below £0.25 than between £0.51 and £1.00.
3. We calculate the total value of stakes placed in each bin, and in total across all bins. The GGY from these stakes is a fixed proportion of the total value staked.
4. For the stake bins higher than the new cap (£1-£5, depending on the scenario), we replace the previous midpoint value with the new maximum stake, and recalculate the total value of all stakes based on that scenario.

³⁶ Social Market Foundation (August 2020), Gambling Review and Reform – Towards a New Regulatory Framework, p.33.

³⁷ Gambling Commission (June 2020), October 2019: Industry Challenges – Progress Update, p.9.

³⁸ APPG (June 2020), Report from the Gambling Related Harm All-Party Parliamentary Group, p.57.

³⁹ Social Market Foundation (August 2020), Gambling Review and Reform – Towards a New Regulatory Framework, p.34.

⁴⁰ Forrest, D and McHale, I (March 2018), Analysis of Play Among British Online Gamblers on Slots and Other Casino-Style Games, p.10.

5. We calculate the percentage difference in total value of stakes between the case where there is no maximum stake and each of the scenarios where there is one. Because GGY is a fixed proportion of the value staked, these percentages are applicable to GGY reductions as well.

As shown in Table 3.1, we estimate that a £5 maximum stake would yield a 14 per cent reduction in slots GGY; a £2 maximum stake would yield a 23 per cent reduction; and £1 maximum stake would yield a 36 per cent reduction.

Table 3.1: Revenue Impact of Slots Stake Size Maximum

Stake Bin (£/play)	Total Plays ('000)	Average Stake (£/play)				Total Staked (£m)			
		No Max	£5 max	£2 max	£1 max	No Max	£5 max	£2 max	£1 max
≤0.25	607,561	0.25	0.25	0.25	0.25	152	152	152	152
0.26-0.5	524,299	0.35	0.35	0.35	0.35	185	185	185	185
0.51-1	380,004	0.64	0.64	0.64	0.64	242	242	242	242
1-2	181,499	1.22	1.22	1.22	1.00	221	221	221	181
2-5	100,684	2.31	2.31	2.00	1.00	232	232	201	101
5-10	20,010	5.32	5.00	2.00	1.00	106	100	40	20
10-20	6,672	10.93	5.00	2.00	1.00	73	33	13	7
20-30	2,019	20.71	5.00	2.00	1.00	42	10	4	2
30-40	503	32.83	5.00	2.00	1.00	17	3	1	1
40-50	794	42.77	5.00	2.00	1.00	34	4	2	1
50-75	192	57.22	5.00	2.00	1.00	11	1	0	0
75-100	322	90.09	5.00	2.00	1.00	29	2	1	0
100-250	293	110.52	5.00	2.00	1.00	32	1	1	0
250-500	24	253.78	5.00	2.00	1.00	6	0	0	0
>500	4	500.01	5.00	2.00	1.00	2	0	0	0
TOTAL (£m)						1,384	1,186	1,062	891
% Difference							-14%	-23%	-36%

Source: Forrest and McHale, NERA Analysis

While the stake distributions are based on play patterns that are four years old, we can cross check some simple statistics against more recent data. Our analysis of the Forrest and McHale distribution suggests that the average stake placed in the sample is approximately £0.76. Data published by the Gambling Commission showing total plays and GGY on online platforms since the beginning of Covid-19 suggests that the average stake for online slots between April and December 2020 was £0.88.⁴¹

It is not possible to build a distribution from the Gambling Commission's recent data. We therefore conclude that the distribution we build from Forrest and McHale remains appropriate today.

This analysis does not seek to quantify any substitution effects which players could adopt in reaction to a new maximum level. For example, players could respond by playing longer

⁴¹ See Appendix A.1 for a derivation of this average.

sessions. Alternatively, a player who previously placed their stakes both above and below the new maximum stake may increase their lower bets towards the new maximum level.

3.1.2. Limits on play speed

We assume that online slots will have a minimum play speed of 5 seconds per play, and online table games will have a minimum play speed of 60 seconds per play. We assume there are no limits placed on peer-to-peer poker.

3.1.2.1. Play speed: Slots

The Gambling Commission has announced the introduction of a 2.5 second minimum play speed on slots, effective as of October 2021.⁴² PGR has advised us to also consider a 5 second minimum.

Very little information exists on the distribution of speed of play on online slots. We have considered the following two pieces of information:

- From the Gambling Commission's 2017 data on machine use in betting shops shows that the average spin speed for B3 slots is around 5.5 seconds per spin.⁴³ However, this is specific to terrestrial slot games which already had a minimum speed of 2.5 seconds per spin, so it is not clear whether the finding would hold for online slots which do not currently have a minimum play speed.
- NatCen's March 2021 report on online patterns of play finds that 1.55 per cent of all players had an average spin speed of less than 2 seconds per spin over at least one whole session in the previous year. However, the report does not provide any more detail on the distribution of play speed.

From these two pieces of evidence, it is apparent that at least some play on online slots occurs at a rate faster than once every 5 seconds, but it is not possible to estimate how much. We therefore do not estimate the amount of revenue lost from the introduction of a minimum spin speed for online slots.

3.1.2.2. Play speed: Table games

For online table games, we refer to experimental research conducted by Dr Philip Newall. His report has been submitted as a separate response to the DCMS call for evidence.⁴⁴

Dr Newall's report summarises a range of evidence showing that average play speed for roulette played in a casino is around 60 seconds.⁴⁵ This average depends on the number of players at the table, with a one-player table having an average speed of 32 seconds. However, casinos rarely run roulette tables with only one player, as this is not economical. We interpret Dr Newall's 60 second assumption to reflect the Committee Report's

⁴² <https://www.gamblingcommission.gov.uk/news-action-and-statistics/news/2021/Gambling-Commission-announces-package-of-changes-which-make-online-games-safer-by-design.aspx>

⁴³ We multiply the mean session length by the number of sessions, and divide by the number of stakes placed.

⁴⁴ Newall, P.W.S., Weiss-Cohen, L., Singmann, H., Boyce, W.P., Walasek, L., & Rockloff, M.J. (2021). A speed-of-play limit reduces gambling expenditure in an online roulette game.

⁴⁵ Newall, P.W.S., Weiss-Cohen, L., Singmann, H., Boyce, W.P., Walasek, L., & Rockloff, M.J. (2021). A speed-of-play limit reduces gambling expenditure in an online roulette game, p.4.

recommendation that no table game can be played faster than it would be in its terrestrial form.

Dr Newall conducted an experiment with 1,002 UK online roulette players, who were given an endowment of £4. They were free to accept the £4 endowment and leave the study without playing roulette at all, or they could gamble some or all of it with the potential to earn more (or leave with less).

Half of players were able to spin the virtual roulette wheel as soon as they had placed their stakes. The other half were required to wait at least 60 seconds after their previous spin before they could spin again. This experiment therefore approximates the changes in conditions that would occur if a 60 second minimum play time were placed on online roulette.

In analysing the patterns of play between the two groups, Dr Newall finds the following (among other findings):

- Players in the unrestricted group played once every 21.0 seconds on average. Players in the slowed-down group played once every 88.6 seconds.⁴⁶ These figures exclude the time prior to the first spin and after the last spin, during which the player is becoming acquainted with the system or has stopped engaging in gambling activity. Averages also exclude players who only played one spin.
- Players in the unrestricted group played an average of 2.9 spins before cashing out. Players in the slowed-down group spend 1.3 spins before cashing out.⁴⁷ Combined with the different play speeds above, this means players in the unrestricted group played for 61 seconds on average, while players in the slowed-down group played for 115 seconds on average, an 89 per cent increase in session length (i.e. the time in between the first and last spin).
- Players in the unrestricted group placed an average stake of £0.89, compared to an average stake of £0.94 in the slowed-down group, though this difference is not statistically significant.⁴⁸ Thus, the average stake in the slowed-down group was 6.1 per cent higher than in the unrestricted group.

We use these findings to estimate a percentage revenue loss from a minimum play speed for online roulette, which we extend to other online table games excluding peer-to-peer poker. In particular:

- In the Low Impact scenario, we assume that players place 55 per cent fewer stakes in a session (i.e. $1 - 1.3/2.9$), whilst staking 6.1 per cent higher on average. Taking these two effects together, we estimate a stake and GGY reduction of 52 per cent.

⁴⁶ Newall, P.W.S., Weiss-Cohen, L., Singmann, H., Boyce, W.P., Walasek, L., & Rockloff, M.J. (2021). A speed-of-play limit reduces gambling expenditure in an online roulette game, p.14

⁴⁷ Newall, P.W.S., Weiss-Cohen, L., Singmann, H., Boyce, W.P., Walasek, L., & Rockloff, M.J. (2021). A speed-of-play limit reduces gambling expenditure in an online roulette game, p.16

⁴⁸ Note: These averages are actually the “model-predicted mean bet sizes”, which limit the influence of outliers to the mean. Newall, P.W.S., Weiss-Cohen, L., Singmann, H., Boyce, W.P., Walasek, L., & Rockloff, M.J. (2021). A speed-of-play limit reduces gambling expenditure in an online roulette game, p.17

- In the High Impact scenario, we assume that there are no adjustments to play patterns other than a 76 per cent decrease in play speed (i.e. $1 - 21/88.6$). There is reason to believe that an 89 per cent increase in session length does not scale up to a real world setting where sessions are already longer than 2.9 minutes on average, and the 1.4 per cent stake size increase was not statistically significant. We therefore assume a GGY reduction of 76 per cent across online table games.
- In the Medium Impact scenario, we take a midpoint of the Low and High Impact scenarios, i.e. 64 per cent reduction in GGY.

3.1.3. Aggregated structural effects

As discussed above, we separately identify a revenue reduction for online slots due to stake size limits, and online table games due to play speed limits. We assume no revenue reduction for peer-to-peer poker. We combine these into a single online casino games revenue reduction, weighted by each category's 2019-20 GGY as reported in the latest Industry Statistics. We show this in Table 3.2 below.

Table 3.2: GGY Reduction from Game Structure Limits

	Slots GGY Reduction	Table Games GGY Reduction	Peer-to-Peer Poker GGY Reduction	Casino Game Average GGY Reduction (%)	Casino Game Average GGY Reduction (£m)
2019-20 GGY (£m)	2,212	865	98		
Weighting Factor	70%	27%	3%		
Low Impact	-14%	-52%	0%	-24%	-770
Medium Impact	-23%	-64%	0%	-34%	-1,071
High Impact	-36%	-76%	0%	-46%	-1,447

Source: Gambling Commission, NERA Analysis

3.2. Affordability checks

3.2.1. Affordability check design assumptions

The Committee Report recommends that “the Gambling Commission must amend its Formal Guidance for Remote Gambling Operators to define the minimum steps which operators should take when considering customer affordability, and to make clear that it is for the operator to take those steps, and any necessary additional steps, which will enable them to identify customers who are betting more than they can afford”.⁴⁹

This provides little detail on how an affordability check would work in practice, which the Committee Report leaves for the Gambling Commission and gambling operators to develop further.

The Gambling Commission is currently conducting a consultation on Remote Customer Interaction, which focuses particularly on “stronger requirements that will help ensure remote gambling operators do more to identify consumers who may be harmed by gambling and to interact and take action sufficiently early and effectively to prevent harm”, including

⁴⁹ Committee Report, para. 326.

affordability checks.⁵⁰ The Gambling Commission’s consultation and call for evidence closed on 9 February 2021, and it has not yet issued any resulting conclusions.

In the absence of any published thinking on affordability check design from the Gambling Commission, we make two assumptions on how a final affordability check design could look in practice.

First, we assume that an affordability check is conducted when an individual attempts to deposit more than £100 in any rolling 30-day period, across all online gaming and betting activities and gambling operators. This does not include online play of The National Lottery. This threshold is defined in the SMF Gambling Review and Reform report, which in turn derives from the Minimum Income Standard weekly expenditure allocated to “Social and Cultural Participation”.⁵¹

Second, once subject to an affordability check, we assume that an individual player will be allowed to place monthly deposits of up to £100 or (10/15/20) per cent of their monthly disposable income, whichever is greater. We also derive this assumption from the Minimum Income Standard, which shows that single adult living at the Minimum Income Standard could spend 15 per cent of their disposable income on “Social and Cultural Participation”.⁵² We use this assumption for the Medium Impact scenario. We apply a more lax standard of 20 per cent in the Low Impact scenario and a more stringent standard of 10 per cent in the High Impact scenario. In all cases, we assume that an individual’s affordability level cannot be lower than the level at which the check is carried out in the first place (i.e. £100 per month).

3.2.2. Affordability check revenue estimates

In this section, we estimate the level of GGY which would be lost by operators due to players’ inability to gamble beyond their means as defined by the affordability check. While this represents a loss in revenues to gambling operators, we note that, by definition, this money should not be spent on gambling because the players cannot afford it.

To assess the level of GGY losses, we adopt the following steps, described in greater detail in Appendix A.2:

1. Forrest and McHale (2018) presents a distribution of player accounts in terms of their net expenditure over the month of January 2017, aggregated into bins from a net expenditure of -£5,000 (i.e the player won £5,000) to +£5,000. The player accounts are presented separately for slots and non-slots, and across the 11 large online operators who submitted data in a consistent format.

The data therefore counts many individual players as multiple separate data points, but it is not possible to estimate the extent to which this biases our analysis. In order to limit this bias, however, we use only the distribution of expenditure for non-slot play, because

⁵⁰ Gambling Commission, Remote customer interaction – Consultation and Call for Evidence. Accessed 4 May 2021. URL: [Remote customer interaction - Consultation and Call for Evidence - The Gambling Commission - Citizen Space](#)

⁵¹ Social Market Foundation (August 2020), Gambling Review and Reform – Towards a New Regulatory Framework, p.46.

⁵² Joseph Rowntree Foundation (July 2020), A Minimum Income Standard for the United Kingdom in 2020, p.12. Note: Disposable income excludes council tax.

the distribution is wider than non-slots play and hence suggests a greater proportion of players would be affected by an affordability check.

2. From the Forrest and McHale distribution, we estimate that around 80 per cent of total non-slots revenue comes from players with a net expenditure of greater than plus or minus £100. These players would be subject to an affordability check, although many of them would not ultimately be affected by it.
3. We consider both the positive and negative side of the expenditure distribution equally, to approximate the fact that limits on players' gambling activity will narrow the distribution of outcomes, but will not affect gambling operators' expected GGY per pound staked.

To use a practical example, a player would have to be very lucky to end a month with a £1,000 profit without ever depositing more than £100. It can happen in individual cases, but when aggregating across all of the players of a gambling operator, this will happen much less often than if players are not limited in their deposits.

4. The ONS publishes distributions on equivalised household disposable income. This data presents each household's disposable income (i.e. net of taxes) divided by its equivalised size, where the first adult counts as 1 person, each subsequent adult at least 14 years in age counts as 0.5 people, and each child under 14 count as 0.3 people.⁵³ The median annual income by this measure is £29,000 and the mean is £36,900. We assume that this distribution is reflective of the annual income of online gamblers.
5. For each expenditure bin greater than plus or minus £100 per month, we estimate the proportion of the UK population who can afford that expenditure level (i.e. 10-20 per cent of their income, depending on the scenario), using a single point estimate of expenditure within that bin. This proportion of player accounts are not affected by affordability checks. Of the balance that are affected, we estimate the average level they *could* afford.
6. We recalculate the total net expenditure and hence revenue to gambling operators based on: the unaffected gamblers continuing to spend the same level as before; and the affected gamblers spending at the average level they can afford (both positive and negative).

From this analysis, we estimate that a 20 per cent threshold would reduce operators' revenue by 32 per cent. A 15 per cent threshold would reduce revenue by 38 per cent, and a 10 per cent threshold would reduce revenue by 45 per cent.

We assume that this analysis applies to slots play as well, to partially account for the fact that player accounts appear separately between slots and non-slots, while an affordability check would consider a single player across all of their online play.

Affordability checks would also apply to online betting activity. We do not have expenditure distributions for online betting, but data presented in NatCen's March 2021 report suggests that large losses are less likely than in casino games. NatCen finds that 2.2 per cent of betting accounts lost more than £2,000 in a year, while 3.2 per cent of gaming accounts lost that much. We therefore scale down the revenue reductions by 2.2/3.2 and apply to gambling operators' online sports betting GGY.

⁵³ ONS (21 January 2021), Average household income, UK: financial year 2020. Link: [https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/bulletins/householddisposableincomeandinequality/financialyear2020#:~:text=In%20financial%20year%20ending%20\(FYE,\(ONS\)%20Household%20Finances%20Survey](https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/bulletins/householddisposableincomeandinequality/financialyear2020#:~:text=In%20financial%20year%20ending%20(FYE,(ONS)%20Household%20Finances%20Survey).

We summarise these results in Table 3.3.

Table 3.3: Online Affordability Check GGY Assumptions

	Casino Games		Betting	
	%	£m	%	£m
Low Impact	-32%	-1,002	-22%	-505
Medium Impact	-38%	-1,198	-26%	-604
High Impact	-45%	-1,441	-31%	-727

Source: NERA Analysis

Furthermore, the introduction of affordability checks and the imposition of structural game changes (maximum stake or play speed) are related concepts, and will drive many of the same revenue reductions. For example, if players are not able to stake high amounts on online slots, or play online roulette at a very rapid speed, they will be less likely to reach the levels of expenditure which would be affected by an affordability check.

To avoid double-counting these effects, therefore, we apply only the larger of the two GGY reductions in each scenario, for casino games only. The structural game changes do not apply to sports betting, so we apply a GGY reduction based only on affordability checks.

Gambling operators currently conduct affordability checks, though there is no consistent approach across operators. We assume that an alignment of standards across operators will not impose any additional direct cost to the industry (i.e. separate from the lost revenue).

3.3. Mandatory levy

The Committee Report recommends that Government should require licensed gambling operators to “pay to the Gambling Commission an annual levy sufficient to fund research, education, and treatment, including treatment provided by the NHS” and that this levy should be structured such that “companies offering potentially more harmful products to pay a correspondingly higher proportion of the levy”.⁵⁴

We have been advised to assume that the mandatory levy recovers £150 million per annum, just over 1 per cent of current GGY on average. We assume that it would be levied on a “smart” basis, with a higher rate applied to more potentially harmful products, though this distinction has no bearing on our analysis. In effect, we assume that the rates can be calibrated such that the levy recovers £150 million based on the sector-specific GGY after online structural limits are implemented.

We assume that the revenue raised through the mandatory levy is directed primarily to two sources:

- *Research, education and treatment (RET)*

The Responsible Gambling Strategy Board (RGSB) estimates that the annual funding required “if there was a commitment to making a real difference” in gambling harm would be: (i) at least £4.5 million in research; (ii) up to £12 million in education; and (iii)

⁵⁴ Committee Report, paras. 557 & 560.

“significantly more than” what is currently spent on treatment (£6 million to treat 2 per cent of affected gamblers).⁵⁵

Extrapolating the unit costs of gambling treatment, RGSB estimates that it could cost £20 million to treat each 10 per cent of affected gamblers in a year. RGSB also notes that “30 per cent of drug users and people with alcohol dependency in England present for treatment”.⁵⁶ We assume, therefore, that an effective treatment programme would cost £90 million. In total, we assume that an optimal RET programme would cost £106.5 million per year, though a more scaled-back programme could still be a substantial increase on the industry’s current expenditure on RET (approximately £19 million).

- *Gambling Ombudsman*

We assume that the administrative cost of the newly-created Gambling Ombudsman is derived from the revenue raised from the Mandatory Levy. We have been advised to assume that the Gambling Ombudsman could have a similar administrative cost as the Gambling Commission, or roughly £20 million annually for gambling regulation activities.⁵⁷

In modelling the effects of the proposed reforms on the Exchequer (in Section 4.2.4), we assume that £130 million is directed to the Exchequer (the total Mandatory Levy revenue minus the budget of the Gambling Ombudsman), and assume that Government will determine how much to fund RET.⁵⁸

The gambling industry contributed £19 million per year to contribute to RET in 2020-21.⁵⁹ We assume that this voluntary contribution is superseded by the Mandatory Levy, and that the industry’s costs will reduce by £19 million, as a result.

3.4. Loot boxes

The Committee Report recommends that Government should “make regulations under [...] the Gambling Act 2005 specifying that loot boxes and any other similar games are games of chance”, and hence considered to be a form of gambling.⁶⁰

⁵⁵ Responsible Gambling Strategy Board (May 2018), *Two years on: progress delivering National Responsible Gambling Strategy*, p.25.

⁵⁶ Responsible Gambling Strategy Board (May 2018), *Two years on: progress delivering National Responsible Gambling Strategy*, p.24.

⁵⁷ The Gambling Commission’s costs of regulating the gambling industry are covered by fees provided by gambling operators. DCMS is currently consulting on an increase to operator fees “to enable the Commission to continue to recover its costs and respond to new changes”.

Sources: [1] DCMS (29 January 2021), *Proposals for changes to Gambling Commission fees from 1 October 2021*, para. 1; [2] Gambling Commission (2020), *Annual Report and Accounts 2019-20*, p.25.

⁵⁸ Note, we use Government as a catch-all term for all elements of Her Majesty’s Government, excluding the specific role that DCMS has in the context of gambling. References to Government in this report could more specifically apply to HM Treasury, HM Revenue & Customs or the Cabinet, but we do not distinguish.

⁵⁹ SBC News (14 April 2021), *Big Four RET Commitment Sees Gambleaware Donations Top £19 million*. Accessed 3 May 2021. URL: <https://sbcnews.co.uk/latestnews/2021/04/14/big-four-ret-commitment-sees-gambleaware-donations-top-19m/>.

⁶⁰ Committee Report, para. 446.

Loot boxes are an in-game feature in many video games which allow a player to pay real money (or purchased in-game currency) for an uncertain outcome. For example, in EA's popular FIFA franchise, a player can pay in-game currency for a player pack that may or may not include a superstar player.

Loot boxes are not currently considered a form of gambling in the UK, and can therefore be played by players under 18. It is unclear whether it will be possible to classify loot boxes as gambling through new regulations, or whether primary legislation will be necessary. For the purposes of this report, we assume that loot boxes are classified as a gambling activity and hence cannot be accessed by players under 18, and that the Gambling Commission is responsible for assessing and enforcing the new policy.

We have discussed this topic with Dr David Zendle, a lecturer in computer science at the University of York, and a key witness to the Committee Report section on loot boxes. Based on our discussions with Dr Zendle as well as our own research, we do not model any revenue reduction from the reform, for the following reasons:

- There is scant data on the level of revenue that video game companies earn from loot box content. Juniper Research estimated in 2018 that total spend on loot boxes and skins gambling (the explicit gambling using in-game features as currency) would reach \$50 billion by 2022.⁶¹ It is unclear how much of this revenue would come from loot boxes in the UK specifically. The industry itself has not released any estimates.
- Even if it were clear how much video game industry earned from loot box, it would be challenging to say how much they would earn from other sources if they removed them. For example, games could replace loot box content with *transparent* in-game purchases which would not be classified as gambling. Additionally, the major video game companies offer many games with many different formats. In the absence of loot box content, the companies could place more emphasis on pushing their games that do not have loot box content.
- Across the video game industry, video games are moving away from loot box content anyway. For example, Epic Games, a major video game company and owner of the popular Fortnite franchise, removed randomised loot boxes from its content worldwide in 2019. Its CEO Tim Sweeney stated that games with loot boxes were “doing their customers harm”, and predicted that “more and more publishers [would] move away from loot boxes”.⁶² It is therefore possible that, by the time new reforms are implemented, the industry will have already generally moved away from affected content.

Nonetheless, the newly regulated entities (video game companies) are operationally very different from gambling operators, and loot boxes are very different in nature from other gambling activities. Therefore, in order to draft and enforce regulation specific to loot boxes, the Gambling Commission (or whichever entity is tasked with enforcement) would need to incur significant new costs, hire new staff and develop significant new expertise.

⁶¹ Juniper Research (17 April 2018), Loot Boxes & Skins Gambling to Generate a \$50 Billion Industry by 2022. URL: <https://www.juniperresearch.com/press/press-releases/loot-boxes-and-skins-gambling>, accessed 23 March 2021.

⁶² BBC (14 February 2020), Fortnite boss says game loot boxes ‘cause harm’. URL: <https://www.bbc.co.uk/news/technology-51502592>, accessed 27 March 2021.

In line with its current cost relating to gambling regulation, we assume that the Gambling Commission would incur an addition £20 million annually in regulating loot boxes. This annual cost could decline if the industry trend away from loot boxes declines. Similar to the fees that gambling operators pay to cover the Gambling Commission’s costs of regulating gambling, we assume that video game companies with loot box content would be assessed a fee that would cover the Gambling Commission’s costs in regulating loot boxes.

3.5. Ban on direct sponsorship

The Committee Report recommends that “Gambling operators should no longer be allowed to advertise on the shirts of sports teams or any other part of their kit. There should be no gambling advertising in or near any sports grounds or sports venues, including sports programmes”. This does not include horseracing or greyhound racing.⁶³

We assume that all sponsorship of professional football and rugby league by gambling operators is prohibited. This includes advertising on kit, sports programmes, at or near sports venues and of leagues themselves (such as the Sky Bet English Football League).

We have been advised to focus especially on professional football and rugby league. We assume that sports with close ties to the betting industry are unaffected. This includes horseracing, greyhound racing, darts and snooker.

When considering the economic impact of a ban on direct sponsorship of sport, we consider two distinct effects:

- Sports teams and leagues may see a decline in commercial revenues, insofar as these revenues cannot be fully replaced through non-gambling sponsors. For this effect, we consider the English Football League (EFL, divided into Championship, League One and League Two) and the Rugby Football League (RFL). We do not consider Premier League football, because sponsorship revenue is a small component of Premiership clubs’ financing and non-gambling sponsors are willing to pay for the global reach associated with a Premiership jersey.
- Gambling operators will see a decline in their advertising costs. For this effect, we consider all leagues above plus the Premier League.

The value of sports sponsorship deals is rarely officially reported. Even for the most lucrative and high-profile jersey sponsorship deals, the value is only “understood” by the football press rather than announced.⁶⁴ For lower-profile deals, such precise estimates are not available. We have therefore relied heavily on the insight of Kieran Maguire, a lecturer in football finance at the University of Liverpool and author of the book *The Price of Football*.

⁶³ Committee Report, paras. 524-526.

⁶⁴ E.g. Manchester United has signed a new jersey sponsorship deal with TeamViewer. Football press reports that “it is understood that the deal is worth around £47 million per season”. Source: <https://www.goal.com/en/news/man-utd-announce-new-shirt-sponsor-teamviewer-in-235m-deal/2d6sv2ut2rs81tikgfsq18780>

3.5.1. Revenue effects on selected sports teams and leagues

EFL and RFL may face a reduction in commercial revenue if direct sponsorship from gambling operators is banned. While the leagues and their teams will be able to find replacement sponsors, they will likely have to settle for a lower-valued deal.

For example, Mr Maguire, advises that a large club in EFL Championship could expect to earn around £1 million in annual jersey sponsorship revenue if its main sponsor is a gambling operator, and £500,000 if its main sponsor is not. With limited alternative data sources, we assume that a non-gambling sponsor will thus only pay half as much for a particular sponsorship spot as a gambling sponsor, regardless of the league or the spot.

For each of the three leagues of EFL, we model the following sources of lost revenue:

- *Jersey deals.* We assume that all gambling operators on the front of a football jersey is replaced with a non-gambling operator, at a 50 per cent mark-down. As above, we assume that a team in the Championship would lose £500,000 by switching to a non-gambling sponsor. No team in League One or League Two has a gambling operator as its jersey sponsor.⁶⁵

We then multiply this lost revenue by the number of teams in each league that have a gambling operator on its jersey: 12 teams in the Championship; 0 teams in League One or Two.

- *League-wide sponsorship.* In particular, Sky Bet sponsors EFL (e.g. “the Sky Bet Championship”) in a deal worth £40 million annually. We assume that this could be replaced with a non-gambling sponsor for £20 million. We allocate this £20 million between the three divisions in line with their annual revenues as a share of total EFL revenue.

We present our estimated revenue impacts for EFL in Table 3.4 below.

⁶⁵ League Two’s Southend United FC is sponsored by Watchlotto, a game that allows players the chance to win a luxury watch by successfully locating the centre of a football that has been removed from an action photograph. Because there is an element of skill to it (as suggested by its website), it appears to not qualify as a form of gambling.

Table 3.4: Monetary Impact on EFL Leagues (£m/year)

	Championship	League One	League Two	Total
Total Revenue	785	191	91	1,067
Ratio to EFL Total	74%	18%	9%	
Jersey Revenue – Gambling	1	-	-	
Jersey Revenue – Non-Gambling	0.5	-	-	
Teams with Major Gambling Sponsor	12	-	-	
Jersey Revenue Lost	6	-	-	6
League Revenue - Total	40			
League Revenue – by Division	29	7	3	40
League Revenue Lost	15	4	2	20
Total Revenue Lost	21	4	2	26
Revenue Lost (% of Total)	2.6%	1.9%	1.9%	2.4%

Source: NERA Analysis of public data and data from K. Maguire⁶⁶

As shown in table, the combined divisions of EFL could lose an estimated total of £26 million from the sponsorship ban, driven especially by the loss of Sky Bet as the league's sponsor. The losses are disproportionately concentrated in the Championship, not just because its annual revenues are several times larger than Leagues One and Two, but it is also the only division with any gambling companies as jersey sponsors. Overall, the estimated loss constitutes two to three percent of total revenues of each division.

There may be additional sponsorship losses through the loss of other advertising activity, such as game programmes. We have been unable to quantify this because we have no information on how much money gambling operators currently spend on this form of sponsorship.

For RFL, we have the following pieces of information on sponsorship:

- RFL's annual *total* sponsorship revenue is around £1.9 million, out of annual total revenues of £23 million.⁶⁷ It is not clear how this is allocated between funding sources; and
- The Betfred sponsorship deal for the Super League (the RFL's highest division) is estimated at approximately £1 million per season.⁶⁸ This value appears to be specific to

⁶⁶ EFL revenue data (season 2018/19): Deloitte (11 June 2020), Press release: Record revenues reported for 2018/19 for English and European football clubs ahead of the financial impact of COVID-19. URL: <https://www2.deloitte.com/uk/en/pages/press-releases/articles/annual-review-of-football-finance-2020.html>, accessed 25 March 2021.

⁶⁷ Rugby Football League (2020), Annual Report 2019, p.25.

⁶⁸ SportsPro (22 May 2019), Super League's new Betfred deal worth more than UK£1 a year. URL: <https://www.sportspromedia.com/news/super-league-betfred-sponsorship-one-million-pounds>, accessed 26 March 2021.

the Super League, although Betfred also sponsors the lower leagues of RFL (Championship and League 1), the Women’s Super League, as well as other cups and tournaments in the season.⁶⁹ It is not clear how much sponsorship revenue Betfred provides outside of the Super League sponsorship.

We therefore know that RFL’s gambling-derived sponsorship is at least £1 million (if Betfred’s sponsorship of the Super League is the only such revenue stream) and at most £1.9 million (if 100 per cent of the RFL’s sponsorship revenue derives from gambling operators). No team presently has a gambling operator as its jersey sponsor, so we assume that the ban on direct sponsorship would only affect the league at a league-wide level.

Based on the lower and upper bounds described above, and the 50 per cent mark-down we derive from EFL Championship jersey sponsorship revenue, we estimate that RFL could lose between £500,000 and £950,000 in sponsorship revenue, or 2-4 per cent of its total revenues.

Our analysis represents an estimate of the revenue immediately lost by replacing gambling sponsors with non-gambling sponsors. However, there may be other ways to recuperate this lost revenue outside of sponsorship. Some of these options are already available to teams and leagues, while some may require new policies to access. Potential alternative funding models include:

- Requiring gambling companies to pay for rights to have bets placed in certain leagues;
- For football, re-allocation of revenue earned at the highest levels of sport (e.g. the Premier League) into lower leagues and grassroots football;
- Teams may be able to increase jersey sales to the public if gambling companies are not featured on them: for instance, in season 2020/21 EFL Championship’s Swansea City has replaced its previous betting sponsor on its jersey with Swansea University, seeking the partnership of a “local, prestigious brand”.⁷⁰

3.5.2. Direct effects of sponsorship ban on UK gambling operators

To estimate the effect of the sponsorship ban on UK gambling operators, we consider cost effects and revenue effects.

For cost effects, we assume that companies will save their sponsorship expenditure above as they will not be able to act as sponsors.

We consider only on UK-based gambling sponsors. Many jerseys are sponsored by “white-label” companies – foreign-based gambling companies with little activity or customers in the United Kingdom, whose goal is to attract foreign followers of the leagues.

While we do not quantify the losses to the Premier League in terms of its effects on the Premier League’s financeability, the ban on sponsorship would still apply to Premier League teams, and hence represents a cost saving to the UK gambling sector.

⁶⁹ Rugby Football League (2020), Annual Report 2019, p.8.

⁷⁰ Swansea University website. URL: <https://www.swansea.ac.uk/press-office/news-events/news/2020/08/university-unveiled-as-swansea-citys-new-front-of-shirt-sponsor.php#:~:text=Swansea%20University%20is%20delighted%20to,the%20forthcoming%202020%2D21%20season, accessed 24 March 2021>.

We estimate the following savings in sponsorship:

- Savings in sponsorship Premier League jerseys. The two Premier League teams with jerseys sponsored by UK-based gambling operators are:
 - Fulham FC, sponsored by BetVictor in a deal thought to be worth roughly £3 million;⁷¹
 - West Ham United, sponsored by Betway in a deal thought to be worth roughly £10 million.⁷²
- Savings in sponsorship of EFL Championship jerseys. Eight Championship clubs are sponsored by a UK-based gambling operator (with a further four sponsored by “white label” companies). Public speculation around the sizes of these deals is limited, so we refer to Mr Maguire’s suggestion that such deals are typically worth around £1 million each.
- Savings in league sponsorship, i.e. £40 million from Sky Bet’s sponsorship of EFL, and at least £1 million from Betfred’s sponsorship of RFL.

In sum, therefore, we estimate that UK-based gambling operators save £62 million in sponsorship revenue. We do not estimate how much they could save in other sponsorship spots, such as in game programmes.

For revenue effects, we assume that the gambling sector in aggregate will not see a loss in revenue from not being able to advertise their brand via sponsorship of teams. In the Committee Report, Professor Forrest observes that “betting houses themselves perceive their marketing as about brand share rather than extending the market and there would be some advantage to them from the state doing what competition law prevents them from doing for themselves —negotiating away heavy marketing budgets which just cancel each other out”.⁷³

⁷¹ SportsPro (8 September 2020), Fulham ink BetVictor shirt sponsorship for Premier League return. URL: <https://www.sportspromedia.com/news/fulham-shirt-sponsor-betvictor>, accessed 27 March 2021.

⁷² Football.london (30 May 2019), How much West Ham’s new Betway sponsorship is worth and what it means for the future. URL: <https://www.football.london/west-ham-united-fc/news/west-ham-betway-sponsor-deal-16347251>, accessed 27 March 2021.

⁷³ Committee Report, para. 506

4. Quantified Results

Using the direct effects estimated in Chapter 3, we present the results of our economic analysis of the selected reforms in this chapter, under the Low Impact, Medium Impact and High Impact scenarios. This chapter proceeds as follows:

- In Section 4.1, we set out the estimated effects on the UK gambling sector;
- In Section 4.2, we set out the estimated effects on the wider UK economy; and
- In Section 4.3, we discuss potential outcomes for the NHS and reduced rates of gambling harm.

4.1. Effects on Gambling Sector

4.1.1. Industry modelling framework

Our primary metric for assessing the economic impact on the UK gambling industry is the industry profits, measured initially by the change in industry-wide Earnings Before Interest, Taxation, Depreciation and Amortisation (EBITDA). As we discuss in Section 4.2, we also estimate the reduction in corporate income tax paid by the gambling sector, which in turn partially limits the loss in post-tax profits.

We consider profitability at an industry-wide level, and do not carry out any bottom-up assessment of competitive effects between companies or any other distributional effects. We also do not consider the dynamics of company-wide profitability for gambling operators owned by large multi-national gambling companies.

We start with industry-wide 2019-20 GGY, as reported in the latest Industry Statistics. We list these in Table 4.1 below, aggregated by play segment.

Table 4.1: 2019-20 GGY (£ million)

	Online Betting	Online Casino	Online Bingo	Land Betting	Land Machines*	Land Casino	Land Bingo	Lotteries	TOTAL
GGY	2,330	3,175	177	1,328	1,612	801	314	4,011	13,747

Source: Gambling Commission Industry Statistics. Note: Land Machines includes machines at licensed betting offices, casinos and bingo halls.

We assume that 2019-20 GGY is representative of what the industry would look like in the future if no reforms were made to the sector, excluding the effects of inflation. Implicitly, our modelling results can be thought of as being in 2019-20 real terms.

Not only is 2019-20 the most recent full financial year with available Industry Statistics, the end of the financial year (March 2020) coincides nearly perfectly with the beginning of the Covid-19 pandemic, which has shifted demand away from terrestrial activities towards online activities.

While it is not clear exactly how play patterns will adjust following the end of the pandemic, we assume that they will return to their pre-pandemic patterns. It is outside of the scope of this report to project otherwise.

From the GGYs listed above, we estimate the size of each of the direct effects in raw monetary value. For instance, the direct effects relating to online betting GGY are multiplied by the online betting GGY in Table 4.1.

Next, we consider how each of the direct effects impacts industry profitability. We approach this step separately for revenue, cost and tax effects.

4.1.2. Changes in profitability due to direct revenue effects

We must consider how industry costs change as a result of the decrease in revenues in online gambling (as summarised in Table 3.2 and Table 3.3). Gambling operators will pay lower Remote Gaming Duty (RGD) and may also incur lower operating costs. Because fixed costs do not change as a result of the decrease in revenues, we assume that the change in industry revenue minus the change in industry cost equals the change in industry profitability resulting from the direct revenue effects.

All online operators must pay 21 per cent RGD on GGY from customers who live in the UK.⁷⁴ For each £1 reduction in online GGY, therefore, we assume that the industry saves £0.21 in RGD.

There is greater subjectivity in estimating changes to operating costs. To do so, we analyse the most recent two years' worth of financial results from four large gambling operators: William Hill, GVC, Flutter and Bet365. By considering two years of data for each company, we can measure how direct costs and operating costs changed with GGY one year to the next, and by extension what could be expected from a decrease in GGY.

From these financial results, we estimate that variable operating costs associated with online gambling are around 36 per cent of online gambling GGY, excluding RGD. In other words, for every £1 decrease in online GGY, operators could see a £0.36 decrease in operating costs.

We derive this calculation more thoroughly in Appendix A.3.

Combined with the RGD reduction, we estimate that a £1 reduction in online GGY reduces industry profits by £0.43 (£1 - £0.21 - £0.36).

4.1.3. Changes in profitability due to direct cost effects

We assume that direct cost effects do not have any knock-on effects to revenue or fixed costs. Therefore any direct reduction in costs yields an identical increase in industry profits.

In particular, we assume an increase in industry profitability from cost effects of £81 million: £19 million due to the removal of the voluntary contribution to treating gambling harm, and £62 million due to the ban on direct sponsorship of sports.

4.1.4. Changes in profitability due to direct tax effects

We assume that tax paid through the Mandatory Levy (£150 million) has no knock-on effects to revenue or fixed costs, and that any Mandatory Levy paid yields an identical decrease in industry profits.

⁷⁴ We assume that all GGY reported in Industry Statistics derives from UK residents.

A decrease in EBITDA would also decrease each company's corporate income liability. We discuss our approach to estimating this in Section 4.2.

4.1.5. Modelled effects on gambling sector profitability

In Table 4.2 below, we list the impact of each scenario on the UK Gambling Sector.

Table 4.2: Results - UK Gambling Sector (£ million)

	Low Impact	Medium Impact	High Impact
GGY Reduction	-1,507	-1,802	-2,174
<i>Remote Gambling Duty</i>	-316	-378	-457
<i>Operating Costs</i>	-545	-651	-786
<i>Sports Sponsorship Costs</i>	-62	-62	-62
<i>Mandatory Levy</i>	150	150	150
<i>Voluntary Levy</i>	-19	-19	-19
Total Change in Costs	-792	-961	-1,173
Change in EBITDA	-715	-841	-1,001
<i>Change in Tax Paid</i>	-18	-22	-26
Change in Post-tax Profits	-696	-819	-974

Source: NERA Analysis

As the table shows, we estimate that the set of reforms would reduce the post-tax profits of the gambling sector by £696 million (Low Impact), £819 million (Medium Impact), and £974 million (High Impact) in a typical year post-reform, in real 2020 GBP.

For scale, we compare these estimates to 2019 industry profits, as derived from published financial statements, which we were able to obtain for GVC, Flutter, William Hill, Bet365 and Camelot (the operator of the National Lottery). Pre-tax profits across these five operators in 2019 were £808 million, and post-tax profits were £697 million.

Our estimates do not include profits from the rest of the industry, including Sky Bet, which does not publish financial statements separate from its parent group. They also do not include the £277 million salary that the CEO and majority shareholder of Bet365 earned in 2018-19, which would be categorised as an operating cost to the company itself.⁷⁵ Her 2019-20 salary grew to £421 million.⁷⁶ With these additional considerations, we find that industry profits are likely larger than the financial costs we model.

We do not consider any competitive effects between gambling operators, or how gambling operators may change their business strategies to react to these reforms.

⁷⁵ Casino.org (18 December 2019), Bet365 CEO Denise Coates Ruffles Feathers, Pays Herself \$422 Million in 2019. Accessed 23 April 2021. URL: <https://www.casino.org/news/bet365-ceo-denise-coates-pays-herself-423-million-in-2019/>

⁷⁶ BBC (1 April 2021), Bet365 boss earns £469m in a single year. Accessed 3 May 2021. URL: <https://www.bbc.co.uk/news/business-56594988>

To put these figures into context, we published a report in 2014 on behalf of the Campaign for Fairer Gambling, estimating the economic effects of introducing a £2 maximum stake on FOBTs. We estimated a decrease in industry profitability of between £67 million and £149 million, depending on whether FOBT turnover decreased by 20 per cent or 40 per cent. We estimated that between 692 and 1,165 LBOs could close.⁷⁷

In light of the Machines Data made available in 2017, we updated this analysis taking into account the distribution players' stake behaviour. In that report (not publicly available), we estimated a loss in industry profits of £158 million to £490 million, depending on how players changed the way they played FOBTs or diverted their money to placing over-the-counter bets in the same shops. On average across our scenarios, we estimated that the industry would lose £339 million in profits, and that 1,494 LBOs would close (but some scenarios had none closing).⁷⁸ Our 2017 estimates were higher than the 2014 work largely because we could now see what proportion of revenue was staked above £2.

Our estimate of lost industry profit is higher primarily because:

- The assessed reforms cover a larger segment of the gambling industry than LBO-based machines cover. The 2019-20 GGY of online casino games and online betting was over £5,505 million, while machines in LBOs (i.e. excluding machines in casinos and bingo halls) had a GGY of £1,075 million. Even before the £2 maximum stake was introduced on FOBTs, their annual GGY was typically around £1,800 million, and never exceeded £1,850 million.
- A key feature of our previous work was to estimate substitution to other in-shop gambling activity, either to B3 machines or over-the-counter bets. The set of reforms we assess in this report are designed to be comprehensive to *prevent* that kind of substitution. For example, we assume that an affordability check considers all of the online gambling activity of a single player, across all operators and types of gambling. An affordability check would be ineffective if impacted players could divert that revenue to other gambling activities.
- Additionally, by removing the ability of gambling companies to advertise in sport, the proposed reforms limit the risk of the unintended consequence of a diversion to sports betting.

In response to Government's 2018 announcement of the reduction of FOBT stakes from £100 to £2, the Association of British Bookmakers (ABB) released a statement that "we expect over 4,000 shops to close and 21,000 colleagues to lose their jobs".⁷⁹ We have not assessed employment patterns in the two years since the £2 maximum stake has been in place, but according to Industry Statistics, there were 639 fewer LBOs at the end of FY 2019-20 (7,681) than at the end of FY 2018-19 (8,320), before the new limit went into effect.

⁷⁷ NERA (April 2014), *The Stake of the Nation – Balancing the Bookies*, Tables 4.1-4.3

⁷⁸ NERA (14 August 2017), *Impact Assessment on the Reduction of B2 Machine Maximum Stakes to £2*, Tables 5.4 to 5.6

⁷⁹ RacingTV (17 May 2018), *FOBT: Association of British Bookmakers blasts Government's £2 limit*. URL: <https://www.racingtv.com/news/association-of-british-bookmakers-blasts-government-s-2-limit>, accessed 23 March 2021.

While more shops may have closed during 2020-21, especially in light of the Covid-19 pandemic, the initial findings suggest that losses to the gambling industry due to the FOBTs maximum stake have been on the lower end of our range of 2017 predictions, and far lower than the nearly existential threat described by the ABB in 2018.

While the current reforms are directed at a different segment of the industry than the FOBT maximum stake, the example above serves to illustrate another omitted factor from our analysis: the ability of the industry to react and adapt to new regulations to find new ways to be profitable, in a way that exceeds its own public-facing predictions.

4.2. Effects on Wider Economy

Next, we estimate the potential macroeconomic effects of the proposed reforms, coming through the diversion of lost gambling revenue into other discretionary sectors of the economy.

4.2.1. Modelling revenue substitution

We assume that revenue lost from GGY diverts to the industries below, in proportion with each sector's gross output, as reported in the ONS Blue Book National Accounts:

- Retail Trade, Except of Motor Vehicles and Motorcycles (“Retail”)
- Food and Beverage Service Activities (“Food/Beverage”)
- Creative, Arts and Entertainment Activities (“Creative/Arts”)
- Sports Activities and Amusement and Recreation Activities (“Sports/Amusement”)

Of the industries listed in the Blue Book, these are the industries where an individual can choose to spend more or less on a daily basis. Many other reported industries are not directly purchased or “consumed” by individuals, such as “Public Administration and Defence”, and the others do not allow for discretionary increases or decreases on a short-term basis (e.g. Education). We have no reason to believe that diverted expenditure would split between these industries by any weighting other than their gross output.

We assume that 100 per cent of money not spent on online gambling diverts to these industries, as a decrease to the gross output of Gambling and Betting Activities and an increase in that industry's gross output.

This is certainly an over-estimate because:

- Some revenue will not be spent at all, particularly if the player could not have afforded to spend it on gambling activities;
- Players may divert some revenue to other legal gambling activities; and
- Players may divert some revenue to illegal gambling activities.

Nonetheless, this approach represents a reasonable upper-bound approximation. We do not consider the potential downward biases described above because:

- If a player chooses not to spend elsewhere because they cannot afford it, then it is not economical to spend that money. For example, the player may be able to make a rent

payment that they otherwise would have skipped, which has economic benefits to the player and to society.

- If a player spends in a different gambling activity, that would simply reduce the impact of the reforms on the gambling industry. Additionally, the ban on sport sponsorship limits the potential of a rapid growth of the sports betting segment as an unintended consequence of other reforms.
- It is outside the scope of this report to estimate the amount of revenue that could divert to illegal gambling activities. Instead, we refer to the evidence submitted by then-CEO of the Gambling Commission Neil McArthur to the Select Committee: “There is no great sense of a burgeoning illegal market”.⁸⁰

4.2.2. Macroeconomic characteristics of revenue substitution

The Blue Book National Accounts includes other characteristics of each industry beyond just the gross output, which we list in Table 4.3 both in raw terms and as a proportion of gross output.

Table 4.3: Macroeconomic Characteristics of Diverted Industries

		Gambling	Retail	Food/ Beverage	Creative/ Arts	Sports/ Amuse.
Gross Output (GO)	£m	13,699	156,937	73,441	13,886	21,277
Share of Total		-	59%	28%	5%	8%
Employee Earnings	£m	2,732	58,890	30,509	3,346	8,908
	per £ GO	0.20	0.38	0.42	0.24	0.42
Jobs	# '000	89	2,892	1,849	107	453
	per £m GO	6	18	25	8	21
Gross Value Added	£m	8,328	97,546	39,690	7,685	12,338
	per £ GO	0.61	0.62	0.54	0.55	0.58
Corporate Tax Paid	£m	160	7,589	2,215	27	416
	per £ GO	0.012	0.048	0.030	0.002	0.020

Source: ONS Blue Book National Accounts, NERA Analysis⁸¹

These ratios allow us to estimate potential macroeconomic effects from revenue diversion, in terms of total tax revenue and employment:

- For each £1 increase in gross output of an industry, we estimate a £0.24-£0.42 increase in employee earnings (i.e. wages and salaries). Likewise, we assume that each £1 decrease

⁸⁰ Committee Report, para. 150.

⁸¹ As reported by ONS Input-Output Tables: ONS (October 2020), Supply and Use Tables, 1997-2018. Link: <https://www.ons.gov.uk/economy/nationalaccounts/supplyandusetables/datasets/inputoutputsupplyandusetables>

in gambling sector GGY yields a £0.20 reduction in employee earnings. Additionally, we assume that each additional £1 in earnings yields a £0.20 increase in personal income tax.

- For each £1 million increase in gross output of an industry, we estimate an 8-25 person increase in jobs. Likewise, we assume that each £1 million decrease in gambling sector GGY loses 6 jobs in the sector.
- For each £1 increase in gross output of an industry, we estimate a £0.54-£0.62 increase in that industry's gross value added. For purchases in each of the industries listed, consumers would need to pay 20 per cent Value Added Tax (VAT). While consumers pay VAT on the full price of the item, the seller pays HRMC based only on the value added component. Some food and beverages incur no VAT, but many incur the full rate (e.g. alcoholic beverages, sport drink, restaurant or hot takeaway food, crisps, ice cream and confectionary). We therefore assume that all additional expenditure in this category incurs 20 per cent VAT on the associated increase in gross value added. Note that Gambling is exempt from VAT, and is instead taxed through various gambling duties (e.g. RGD).
- Each £1 reduction in online gambling revenue yields a £0.21 reduction in RGD paid.
- Based on the ratio of tax paid per £1 increase in gross output, we estimate the total change in corporate income tax that would be received due to the diverted revenue. To estimate the *lost* corporate income tax from the gambling sector, we assume that gross output decreases in line with decreased revenue as well as the net increase in Mandatory Levy and costs. This allows us to approximate the decrease in taxable profits resulting from the Mandatory Levy, partially offset by other cost reductions.

4.2.3. Gambling industry inputs into macroeconomic modelling

In Table 4.4, we summarise the outcomes from the gambling sector that feed our macroeconomic modelling:

- Revenue lost due to reduced expenditure on online gambling diverts as an increase in expenditure in other sectors. We model this as an increase to those sectors' gross output, and a decrease in the gambling sector's gross output;
- We use the revenue lost, plus net additional costs due to new reforms (such as the Mandatory Levy), as the change in the gambling sector's gross output for the purposes of estimating the change in corporate income tax paid;
- The revenue lost from online gambling yields a reduction in the RGD paid to the Exchequer; and
- The revenue from the Mandatory Levy which is not already allocated to the Gambling Ombudsman is directed to the Exchequer.

Table 4.4: Summarised Effects of Gambling Industry for Macroeconomic Modelling

	Low Impact	Medium Impact	High Impact
Lost Gambling GGY	1,507	1,802	2,174
<i>Net Additional Costs</i>	69	69	69
Lost taxable gross output	1,576	1,871	2,243
Lost Gambling Duty	316	378	457
Unallocated Mandatory Levy	130	130	130

Source: NERA analysis

4.2.4. Modelled macroeconomic effects

Using the industry characteristics set out in Section 4.2.2 and the relevant gambling industry outcomes summarised in Section 4.2.3, we then estimate the potential macroeconomic effects of each scenario in terms of tax revenue and employment outcomes. We present these results in Table 4.5 to Table 4.7 below.

Table 4.5: Macroeconomic Effects: Low Impact

Line Item	Unit	Gambling	Retail	Food/ Beverage	Creative/ Arts	Sports/ Amusement	Total
Change in Gross Output	£m	-1,507	891	417	79	121	0
Change in Taxable Output	£m	-1,576	891	417	79	121	-78
Change in Gross Value Added	£m	-916	554	225	44	70	-24
Change in Earnings	£m	-301	334	173	19	51	276
Change in Jobs	#	-9,764	16,413	10,495	604	2,570	20,319
<i>Change in RGD/VAT</i>	£m	-316	111	45	9	14	-138
<i>Change in Corporate Tax</i>	£m	-18	43	13	0	2	40
<i>Change in Income Tax</i>	£m	-60	67	35	4	10	55
<i>Unallocated Mandatory Levy</i>		130	0	0	0	0	130
Change in Total Taxes	£m	-265	221	92	13	26	87

Table 4.6: Macroeconomic Effects: Medium Impact

Line Item	Unit	Gambling	Retail	Food/ Beverage	Creative/ Arts	Sports/ Amusement	Total
Change in Gross Output	£m	-1,802	1,065	498	94	144	0
Change in Taxable Output	£m	-1,871	1,065	498	94	144	0
Change in Gross Value Added	£m	-1,095	662	269	52	84	-28
Change in Earnings	£m	-359	400	207	23	60	330
Change in Jobs	#	-11,674	19,625	12,549	723	3,072	24,295
<i>Change in RGD/VAT</i>	£m	-378	132	54	10	17	-165
<i>Change in Corporate Tax</i>	£m	-22	51	15	0	3	48
<i>Change in Income Tax</i>	£m	-72	80	41	5	12	66
<i>Unallocated Mandatory Levy</i>		130	0	0	0	0	130
Change in Total Taxes	£m	-342	264	110	15	32	79

Table 4.7: Macroeconomic Effects: High Impact

Line Item	Unit	Gambling	Retail	Food/ Beverage	Creative/ Arts	Sports/ Amusement	Total
Change in Gross Output	£m	-2,174	1,285	601	114	174	0
Change in Taxable Output	£m	-2,243	1,285	601	114	174	0
Change in Gross Value Added	£m	-1,322	799	325	63	101	-34
Change in Earnings	£m	-434	482	250	27	73	399
Change in Jobs	#	-14,085	23,678	15,140	872	3,707	29,312
<i>Change in RGD/VAT</i>	£m	-457	160	65	13	20	-199
<i>Change in Corporate Tax</i>	£m	-26	62	18	0	3	58
<i>Change in Income Tax</i>	£m	-87	96	50	5	15	80
<i>Unallocated Mandatory Levy</i>		130	0	0	0	0	130
Change in Total Taxes	£m	-439	318	133	18	38	68

Source: NERA Analysis

As the tables show, our models suggest that the reforms in question could have a substantially positive effect on employment outcomes through revenue substitution to other industries, and a small positive effect on general tax revenue recovered by HRMC.

- *Employment outcomes:* We estimate that the reforms could add 20-30 thousand jobs and increase total employee earnings (i.e. salaries and wages) by £276-£399 million.

This positive effect occurs because the gambling sector employs fewer people and pays them less per unit of expenditure than any of the four industries examined here. In fact, of 105 industries listed in the National Accounts, the gambling sector ranks 76th in terms of employee earnings per unit of expenditure in 2018. The two largest comparator sectors, Retail and Food/Beverage, rank 22nd and 18th, respectively.⁸²

We note also that employment in the gambling sector is probably concentrated on terrestrial activities – casino croupiers and dealers, LBO staff, etc – while the revenue reductions we model are exclusively online. Therefore, the job and wage losses in the gambling sector may be lower than what we model and the net impact of the reforms on jobs could be greater.

Our analysis assumes that 100 per cent of revenue is diverted to these related sectors, though this is an upper bound. To demonstrate limited the sensitivity of our employment conclusions to this assumption, we find that there would still be a net increase in jobs (in all scenarios) if as little as 33 per cent were diverted and a net increase in employee earnings if as little as 53 per cent of lost revenue were diverted.

An increase in employee earnings would have further knock-on benefits in terms of employees' income tax contributions and expenditure elsewhere in the economy. At a basic income tax rate of 20 per cent, Government could recover an additional £55-80 million in individual income tax contributions. Furthermore, those employees could spend their additional earnings elsewhere in the economy, creating new jobs and new taxation on that expenditure. We do not quantify these further knock-on benefits.

- *Taxes:* We estimate that the reforms could increase general tax revenue by £68-£87 million annually, the balance of a loss in consumption-based tax revenue (i.e. RGD and VAT), which is more than offset by an increase in corporate income tax, personal income tax, and unallocated Mandatory Levy revenue.

The loss in consumption-based tax revenue is due to the difference in how RGD and VAT are assessed. For every £1 a person spends on online gambling, £0.21 is directly recovered as tax revenue, and the gambling operator would additionally pay VAT to its upstream suppliers. For every £1 a person spends on other activities, they are charged £0.20 in VAT, but a portion of that is used to offset VAT paid by the company to its upstream suppliers. Therefore, a smaller portion of expenditure in other sectors actually makes it to the Exchequer through consumption taxes.

However, our approach may overstate the extent to which gambling expenditure is double-taxed, and hence the level of lost consumption tax revenue. While we have not categorised gambling operators' input costs, many input items, such as labour, do not

⁸² NERA analysis based on: ONS (October 2020), Supply and Use Tables 1997-2018 – Industries' Intermediate Consumption in 2018

incur VAT. Accordingly, the loss in consumption-based tax revenue may be smaller than the £138-£199 million we estimate.

The related sectors pay higher corporate income tax rates on average than the gambling sector, so we assume an increase in corporate income tax recovered of £40-£58 million.

As we describe above, an increase in employee earnings would also yield an increase in personal income tax contribution. We estimate an increase of £55-80 million.

Finally, we assume that £130 million of unallocated Mandatory Levy revenue is directed towards the Exchequer. While this tax revenue may be hypothecated (i.e. it can only be used for specified purposes), we assume that it will free up £130 million in general taxation revenue to be used wherever it is most needed.

In calculating the balance to the Exchequer (of £68-£87 million), we have not included any expenditure on RET, though the Committee Report recommends that the levy “fund research, education and treatment, including treatment provided by the NHS”.⁸³ We assume that this balance would be directed towards RET. In other words, Government could fund £68-£87 million in RET, a substantial increase over the £19 million currently funded by the gambling industry, while still maintaining the revenue neutrality of the Exchequer. While a substantial improvement over the status quo, this expenditure still falls short of the optimal level of £106.5 million we derive in Section 3.3. If reaching this benchmark is a priority for Government, it could achieve it at the expense of £20-£38 million to the Exchequer.⁸⁴

To reiterate from above, we assume 100 per cent revenue diversion purely as an upper bound outcome.

In reality, some lost expenditure will not be spent elsewhere because the player could not have afforded to spend it on gambling or on anything else. In this case, saving the money is the socially and economically optimal choice. For example, if an individual would need to miss a mortgage payment in order to spend the money in question, this would incur an additional cost on the individual and on society that could be avoided if the individual does not spend the money. We expand on some of these effects in general terms in Section 4.3 below.

4.3. Effects on the NHS and the Economy from Gambling Harm

Existing evidence shows that gambling harm is associated with significant increased costs for the healthcare system and the fiscal system in general. In 2016, the Institute for Public Policy Research (IPPR) collected data and research evidence from official gambling statistics and published literature to quantify the costs to government from people with harmful gambling habits in a report for GambleAware.⁸⁵ The report combined academic findings on affected gamblers and original analysis to define the sources of increased costs to government, such as:

⁸³ Committee Report, para. 557.

⁸⁴ £68-£87 million minus £106.5 million.

⁸⁵ IPPR (December 2016), *Cards on the Table: The costs to government associated with people who are problem gamblers in Britain*.

- Affected gamblers are more likely than the general population to have visited a GP regarding a mental health issue (primary care), to access counselling or other therapy services (secondary care) or to have been a hospital outpatient in the 12 months preceding surveying;⁸⁶
- Affected gamblers have a higher likelihood of claiming a job-seeker's allowance (JSA) and therefore not contributing tax receipts;⁸⁷
- Affected gamblers are over-represented in the homeless population and therefore more likely to access homelessness services;⁸⁸
- There is an excess number of prison sentences for affected gamblers.⁸⁹

In Table 4.8 below, we quantify the additional costs to Government spending associated with gamblers with harmful gambling habits. While the excess expenditure cannot always be causally traced specifically to the harmful gambling activity, the expenditure is nonetheless associated with individuals who have harmful gambling habits.

Table 4.8: Excess Fiscal Cost to Government Spending related to Gambling Harm (£m/year)

	Lower Bound	Upper Bound
<i>Primary care (mental health) services</i>	10	40
<i>Secondary care services</i>	30	110
<i>Hospital inpatient services</i>	140	610
Total: Health sector	180	760
<i>JSA claimant costs and lost tax receipts</i>	40	160
<i>Statutory homelessness applications</i>	10	60
<i>Incarcerations</i>	40	190
Total: All sectors	270	1,170

Source: IPPR.⁹⁰ “Lower bound” and “upper bound” estimates depend on the assumed percentage of problem gamblers in the general population according to different official surveys.

As Table 4.8 shows, the estimated excess fiscal costs range from £270 million to £1,170 million per year. For the health sector only, the range is £180 million to £760 million.

If the assessed reforms are effective in reducing harmful gambling activity, some of these excess fiscal costs could be reduced. The extent to which this is true depends on:

- How effective the reforms are in reducing harmful gambling activity; and

⁸⁶ Cowlshaw S. and Kessler D. (2015), Problem Gambling in the UK: Implications for Health, Psychosocial Adjustment and Health Care Utilization, *European Addiction Research* 22, p.90–98.

⁸⁷ IPPR (December 2016), *Cards on the Table: The costs to government associated with people who are problem gamblers in Britain*, p.48.

⁸⁸ Sharman et al. (2014), Rates of Problematic Gambling in a British Homeless Sample: A Preliminary Study, *Journal of Gambling Studies* 31, p.525.

⁸⁹ IPPR (December 2016), *Cards on the Table: The costs to government associated with people who are problem gamblers in Britain*, p.53.

⁹⁰ IPPR (December 2016), *Cards on the Table: The costs to government associated with people who are problem gamblers in Britain*, p.54.

- The extent to which gambling harm is itself the driver of the excess costs listed in Table 4.8. For instance, individuals with harmful gambling habits may also be more likely to exhibit other characteristics that require greater NHS treatment (e.g. alcoholism), and these other characteristics may not disappear even if the harmful gambling activity does.

We do not consider in this report the extent to which either of the conditions above are true.

We have examined measures which provide additional funding for RET. As outlined in Section 4.2.4 above, we assume that at least £68-£87 million is spent on RET, a substantial increase to the existing expenditure, though still short of the potentially optimal level of £106.5 million. If this money is spent effectively, it could achieve some of the fiscal savings outlined in Table 4.8, through effective treatment as well as more effective policy measures resulting from better research.

5. Conclusion

The set of reforms recommended in the Committee Report, and those assessed in this report are wide-reaching, affecting all segments of the British gambling sector. The reforms in question focus especially (though not exclusively) on the online segment, responsible for 40 per cent of the sector's GGY. Accordingly, the impact on the profitability of the sector is large, between £696 million and £974 million annually, compared to industry post-tax profits of at least £697 million in 2019.

When considering additional profits not included in that total (profits of gambling operators other than the five for which we reviewed financial reporting, as well as the £277 million salary of Bet365's CEO), we find that that gambling industry profits are likely to be larger than the financial costs we model.

As described in Section 2.1.3, the online gambling sector earns 24 per cent of its revenues from "problem gamblers" and a further 17 per cent from medium-risk gamblers, as estimated by ResPublica. For scale, our three scenarios reduce the online sector's GGY by 27 to 39 per cent, broadly consistent with the level of revenue ResPublica estimates to come from harmful or medium-risk activity.

With respect to the selected sport leagues, we find that sponsorship from gambling operators does not make up a large component of their revenue streams, particularly in lower tiers of football where viewership is low enough that gambling operators apparently do not see value in jersey sponsorships. To the extent that sports leagues do earn money from gambling sponsors, this could be replaced at a mark-down with non-gambling sponsors, as many teams already do. Additionally, other funding models (such as a fee from gambling operators for the rights to have bets placed on that league) could be implemented to recuperate lost revenues, though we do not explore these in this report.

The economic implications of the reforms are mixed or positive when considering that money not spent in the sector may instead be spent in other discretionary sectors:

- Because the gambling sector is less labour-intensive than other discretionary sectors, we estimate that total employment could increase by up to 30,000 jobs and employee earnings could increase by up to £400 million.
- We estimate that tax revenue may increase by £68-£87 million, not including any new expenditure on RET. In other words, the Exchequer could be revenue neutral while funding £68-£87 million in RET, a substantial increase over the status quo.
- The emphasis of the reforms on funding RET means that harmful gambling rates could decline more than just through the revenue control measures we discuss. In particular, the research could precipitate more targeted and effective reforms in future years.
- As a result of reduced rates of gambling harm, there could be hundreds of millions of pounds in other fiscal savings which are currently spent on individuals with harmful gambling behaviours. This is driven especially by NHS inpatient services, but also the costs of job-seekers' allowances, housing/homelessness costs and incarceration costs.

Appendix A. Detailed Modelling Assumptions

In this Appendix, we provide a more complete description of some of the more technical elements of our modelling approach.

A.1. Maximum Stake

For the purposes of this report, we assume that a maximum stake of £5 (Low Impact), £2 (Medium Impact), or £1 (High Impact) is applied on online slots.

In their analysis of online gaming patterns, Forrest and McHale (2018) collected distributions of all stakes placed on 11 major online gaming operators in January 2017, separated by slots and non-slots play.⁹¹ Forrest and McHale's data presents individual stake levels into bins of stake size, as shown in Table A.1 below.

Table A.1: Online Slots Stake Distribution

Bin	Slots	% of Total
25p or less	607,561,253	33%
26p to 50p	524,299,150	29%
51p to £1	380,003,656	21%
£1.01 to £2	181,498,702	10%
£2.01 to £5	100,684,189	6%
£5.01 to £10	20,010,207	1%
£10.01 to £20	6,672,109	0%
£20.01 to £30	2,019,201	0%
£30.01 to £40	503,269	0%
£40.01 to £50	794,377	0%
£50.01 to £75	192,340	0%
£75.01 to £100	321,834	0%
100.01 to £250	292,509	0%
£250.01 to £500	24,260	0%
>£500	4,477	0%
TOTAL	1,824,881,533	100%

Source: Forrest and McHale, NERA analysis

As the Table shows, 83 per cent of stakes placed on online slots with the surveyed gambling operators in January 2017 were at or below £1. 92 per cent were at or below £2 and 98 per cent were at or below £5. Depending on the price level of the maximum stake, this proportion of stakes would be unaffected.

However, because these stakes are on the small end of the distribution, they represent a smaller share of the total amount staked in GBP terms, and hence of gambling operators' GGY.

⁹¹ Forrest, D and McHale, I (March 2018), Analysis of Play Among British Online Gamblers on Slots and Other Casino-Style Games, p.10.

Because gambling operators provided data to Forrest and McHale already aggregated into stake bins, it is not possible to say precisely how much revenue comes from each bin. In order to form an estimate, however, we estimate an assumed single stake level for each bin as follows:

- For the lowest and highest stake bin, we assume that all stakes are placed at the bin's upper or lower bound – i.e. £0.25 for the lowest bin and £500.01 for the highest bin;
- For all other bins, we take an average of the bin's lower and upper bound, weighted by the size of the neighbouring bin on each side. For example, for the £0.51-£1.00 bin, we calculate $[(29\% * £0.51 + 10\% * £1.00)/(29\% + 10\%)] = £0.64$.

Based on these assumed stake levels, we present the amount of revenue we assume is staked in each bin level in Table A.2 below.

Table A.2: Online Slots Revenue Distribution by Bin

Bin	Average Stake (£/stake)	Total Staked (£)	Percent of total
25p or less	0.25	151,890,313	11%
26p to 50p	0.35	184,736,412	13%
51p to £1	0.64	241,684,390	17%
£1.01 to £2	1.22	220,949,983	16%
£2.01 to £5	2.31	232,269,617	17%
£5.01 to £10	5.32	106,456,794	8%
£10.01 to £20	10.93	72,897,307	5%
£20.01 to £30	20.71	41,819,030	3%
£30.01 to £40	32.83	16,522,596	1%
£40.01 to £50	42.77	33,977,327	2%
£50.01 to £75	57.22	11,004,790	1%
£75.01 to £100	90.09	28,992,881	2%
100.01 to £250	110.52	32,329,201	2%
£250.01 to £500	253.78	6,156,668	0%
>£500	500.01	2,238,545	0%
TOTAL		1,383,925,852	100%

Source: NERA Analysis

From this analysis, we estimate that 42 per cent of staked value comes from stakes beneath £1. 58 per cent and 75 per cent of staked value comes from stakes beneath £2 and £5, respectively. Because the expected prize payout of a slot game does not depend on the value staked, then these percentages apply to gambling operators' GGY as well.

These midpoints also allow us to estimate that the *average* stake placed in the sample is approximately £0.76, while the median is somewhere between £0.26 and £0.50.

We can cross check this average level against more recent data. In February 2021, the Gambling Commission released data on online play patterns since the beginning of Covid-19 pandemic. The data presents the number of bets placed and resulting GGY with the largest

operators (covering 80 per cent of the online gambling activity).⁹² Based on a house edge of 3.81 per cent for online slots (as derived from the total staked and GGY for online slots shown in the Gambling Commission's regular industry statistics), we estimate that the average stake for online slots between April and December 2020 was £0.88. It is not possible to build a distribution from the Gambling Commission's recent data. We therefore conclude that the distribution we build from Forrest and McHale remains appropriate today.

To estimate the revenue impact of introducing a maximum stake level, we replace the average stake for all bins above the new maximum with the exact level of the maximum stake. We then recalculate the total amount staked, and compare in percentage terms to total shown in Table A.2. We show this in Table A.3 below.

Table A.3: Revenue Impact of Slots Stake Size Maximum

Total Plays	Average Stake			Total Staked		
	£5 max	£2 max	£1 max	£5 max	£2 max	£1 max
607,561,253	0.25	0.25	0.25	151,890,313	151,890,313	151,890,313
524,299,150	0.35	0.35	0.35	184,736,412	184,736,412	184,736,412
380,003,656	0.64	0.64	0.64	241,684,390	241,684,390	241,684,390
181,498,702	1.22	1.22	1.00	220,949,983	220,949,983	181,498,702
100,684,189	2.31	2.00	1.00	232,269,617	201,368,378	100,684,189
20,010,207	5.00	2.00	1.00	100,051,035	40,020,414	20,010,207
6,672,109	5.00	2.00	1.00	33,360,545	13,344,218	6,672,109
2,019,201	5.00	2.00	1.00	10,096,005	4,038,402	2,019,201
503,269	5.00	2.00	1.00	2,516,345	1,006,538	503,269
794,377	5.00	2.00	1.00	3,971,885	1,588,754	794,377
192,340	5.00	2.00	1.00	961,700	384,680	192,340
321,834	5.00	2.00	1.00	1,609,170	643,668	321,834
292,509	5.00	2.00	1.00	1,462,545	585,018	292,509
24,260	5.00	2.00	1.00	121,300	48,520	24,260
4,477	5.00	2.00	1.00	22,385	8,954	4,477
TOTAL				1,185,703,629	1,062,298,642	891,328,589
% Difference				-14%	-23%	-36%

Source: NERA Analysis

As the table shows, we estimate that, with a new maximum stake on slots of £5, £2, or £1, gambling operators would see a reduction in total stakes of 14 per cent, 23 per cent and 36 per cent. Because GGY is a fixed proportion of amount staked, they would see the same proportional reduction GGY. Because the result of this analysis is percentage difference, it is dependent on the distribution of stakes rather than the absolute level. It does not matter that online slots play has increased overall since 2017, so long as the distribution of stakes is still reasonable.

This analysis does not seek to quantify any substitution effects which players could adopt in reaction to a new maximum level. For example, players could respond by playing longer

⁹² <https://www.gamblingcommission.gov.uk/news-action-and-statistics/Statistics-and-research/Covid-19-research/Covid-19-updated-February/Gambling-business-data-on-gambling-during-Covid-19-updated-February-2021.aspx>

sessions. Alternatively, a player who previously placed their stakes both above and below the new maximum stake may increase their lower bets towards the new maximum level.

Some of these substitution effects can be observed in the case of the £2 maximum stake placed on FOBTs in 2019. Using play distributions from before the new maximum stake was implemented, and the equivalent analysis shown above, we estimate that betting shops' machine GGY should have decreased by 79 per cent.⁹³ Instead, in the first full year after the new limits were in place, betting shops' machine GGY decreased by 41 per cent.⁹⁴

However, in that case, players substituted from playing B2 content to playing B3 content. B3 content also has a £2 maximum stake but can be played every 2.5 seconds rather than every 20 seconds, making it possible to adjust for the lower maximum stake with faster play speed.

A.2. Affordability Checks GGY Reduction

In this section, we provide greater detail into our approach in estimating the GGY reduction resulting from the introduction of affordability checks, summarised in Section 3.2.

A.2.1. Distribution of player expenditure

In assessing the distribution of play and net expenditure, we rely on data collected by David Forrest and Ian McHale on behalf of GambleAware in 2018.⁹⁵ Forrest and McHale's dataset is based on play data from January 2017 provided by "thirteen large, mainstream operators", though they are not named in the report.⁹⁶ We assume that the Forrest and McHale dataset is representative of the monthly distribution of play for the UK remote sector, and continues to be representative in 2021 (albeit total revenues are now higher).

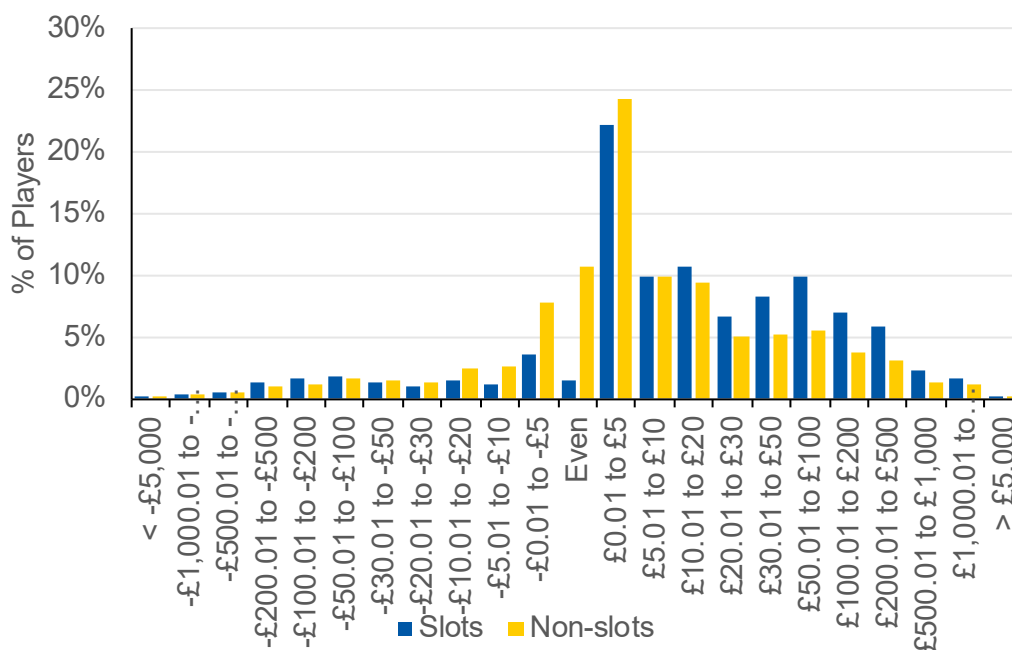
Forrest and McHale present players' monthly net expenditure, as the number of players with net expenditure in a certain range, divided between slots and non-slots. We present this distribution in Figure A.1 below, where a negative number represents net *winnings* for that player in that month.

⁹³ Analysis conducted on Machines Data released by the Gambling Commission in 2017.

⁹⁴ Gambling Commission (November 2020), Industry Statistics, Table 6d.

⁹⁵ Forrest, D. and McHale, I. (March 2018), Analysis of Play Among British Online Gamblers On Slots and Other Casino-Style Games

⁹⁶ Forrest, D. and McHale, I. (March 2018), Analysis of Play Among British Online Gamblers On Slots and Other Casino-Style Games, p.3.

Figure A.1: Player Net Expenditure Distribution

Source: Forrest and McHale

Forrest and McHale’s work comes with a number of caveats and health warnings. For example, they have aggregated the separate submissions from the different operators, and necessarily could not consider that some players have accounts with multiple operators. They also cannot match individual players against their slots and non-slots play, though they note that this could have been avoided if the gambling operators had provided consolidated data.⁹⁷

In the absence of such a single consolidated dataset (which could only become possible following the reforms on which DCMS is currently consulting), we assume that the distribution in Figure A.1 holds when considering a single player’s accounts across multiple operators and game types. To be more conservative in light of this known bias, we use the distribution for non-slots, which is more heavily concentrated on higher levels of win and loss.

A.2.2. Distribution of revenue from players

In estimating the revenue loss resulting from these affordability checks, we must consider the level of net expenditure in each bucket. Forrest and McHale acknowledge that this can only be done with “*very rough*” assumptions, and use a mid-point between the upper and lower bound of each bucket.⁹⁸

We improve upon this slightly by using a weighted average of the upper and lower bound, weighted by the size of the neighbouring bucket on each side. For instance, the average

⁹⁷ Forrest, D and McHale, I (March 2018), Analysis of Play Among British Online Gamblers On Slots and Other Casino-Style Games, p.4-5.

⁹⁸ Forrest, D and McHale, I (March 2018), Analysis of Play Among British Online Gamblers On Slots and Other Casino-Style Games, p.7. Emphasis in original.

player in the £500.01-£1,000 net expenditure range is likely to be closer to £500.01 because the £200.01-£500 range holds more players than the £1,000.01-£5,000 range. Like Forrest and McHale, we assume that players who win or lose more than £5,000 win or lose exactly £5,000.⁹⁹ We present a revenue distribution by bin in Table A.4 below.

Table A.4: Expenditure and Revenue Distribution

Bin	Number of Non-Slots Accounts	Monthly Expenditure Estimate (£/account)	Total Expenditure (£)
< -£5,000	527	-5,000	-2,635,005
-£1,000.01 to -£5,000	2,708	-1,535	-4,156,872
-£500.01 to -£1,000	3,413	-624	-2,130,878
-£200.01 to -£500	8,182	-279	-2,280,639
-£100.01 to -£200	9,592	-138	-1,326,425
-£50.01 to -£100	13,193	-72	-952,224
-£30.01 to -£50	12,040	-41	-495,401
-£20.01 to -£30	10,489	-24	-249,700
-£10.01 to -£20	19,647	-13	-262,700
-£5.01 to -£10	20,688	-6	-128,824
-£0.01 to -£5	60,911	-1	-60,564
Even	84,191	0	0
£0.01 to £5	190,392	2	458,842
£5.01 to £10	78,014	6	499,264
£10.01 to £20	73,488	13	980,267
£20.01 to £30	38,992	24	920,543
£30.01 to £50	41,375	41	1,676,580
£50.01 to £100	43,242	71	3,063,359
£100.01 to £200	29,561	136	4,024,993
£200.01 to £500	24,485	277	6,783,877
£500.01 to £1,000	10,217	633	6,465,152
£1,000.01 to £5,000	8,853	1,518	13,439,108
> £5,000	1,520	5,000	7,600,015
TOTAL	785,720		31,232,767

Source: Forrest and McHale, *NERA Analysis*

Online casino games have fixed odds that necessarily results in a house edge when aggregated across a sufficiently large number of plays. If a player is limited from further deposits in a month due to an affordability check, the gambling operator also insulates itself against the risk that that gambler will have a run of *good* luck immediately after. Therefore,

⁹⁹ Forrest, D and McHale, I (March 2018), *Analysis of Play Among British Online Gamblers On Slots and Other Casino-Style Games*, p.8.

in order to assess the change in revenues resulting from a truncation of this distribution, we must hold the aggregate prize payout percentage fixed.

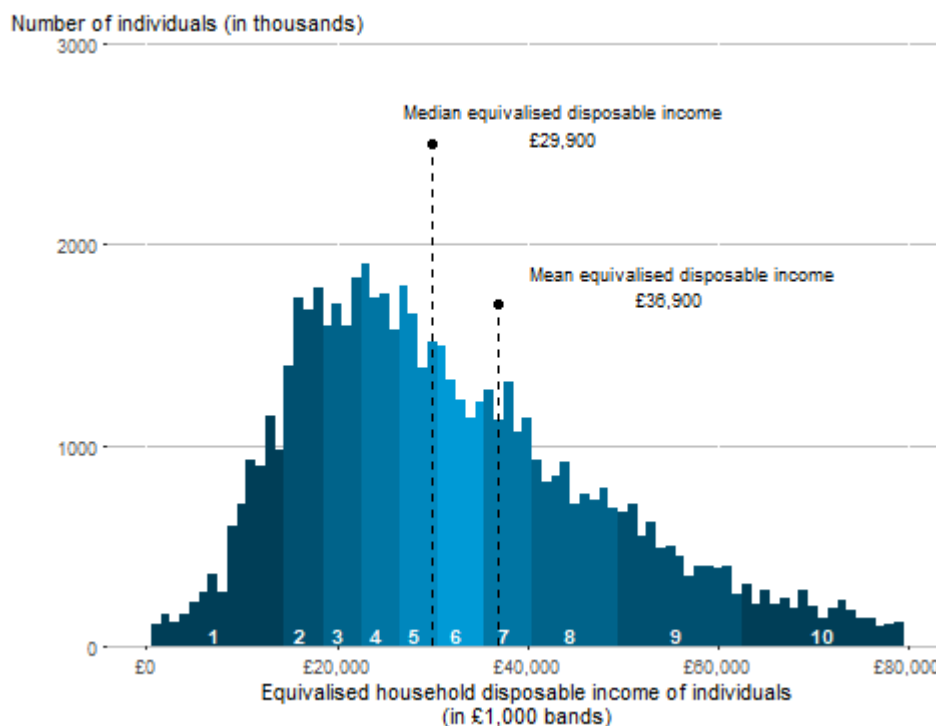
In practice, this is challenging or impossible to do given the levels of aggregation in the data, and our inability map individual players' net expenditures to a series of plays, stakes, wins and losses.

Therefore, as a simplification, we assume that the same proportion of gamblers that are limited from reaching a loss of greater than £100 are also limited from achieving a gain of greater than £100. This simplification is grounded in logic: very few people will be able to end a month with a net gain of £1,000 or more if they are limited from depositing more than £100 because of an affordability check.

A.2.3. Distribution of income and affordability

The next step is to identify a share of accounts from the distribution who would be affected by an affordability check, once the threshold for carrying one out is triggered. Our three scenarios assume that players would be allowed to deposit up to 10, 15 and 20 per cent of their monthly income on gambling activities in a given month, based roughly on the Minimum Income Standard allowance for a single person household.

We compare this to a distribution of annual equavalised household disposable income, reported by the ONS. Disposable income is defined to exclude direct taxes (including council tax), and equivalisation divides the total household income by a measure of household size: 1 for the first adult; 0.5 for each subsequent adult at least 14 years in age; and 0.3 for each child under 14. We present this distribution in Figure A.2 below.

Figure A.2: Annual Equivalised Household Disposable Income

Source: ONS

We use this distribution to represent the income relevant to an individual's affordability check, after converting into monthly values.

A.2.4. Combined revenue loss assumption

To calculate the level of revenue reduction resulting from affordability checks, we adopt the following procedure:

1. First, for each expenditure bin greater than £100, we compare that bin's assumed midpoint value to the ONS monthly income distribution, multiplied by the affordability percentage relevant to that particular scenario. From that distribution, we identify what percentage of players would be able to afford that level of expenditure.
2. For example, for the £200.01-£500 bin, we assume that all players in that bin have an expenditure of £277 for the month. In the High Impact scenario (with an affordability percentage of 10 per cent), we assume that players would need a monthly disposable income of £2,770, or £33,240 annually. About 43 per cent of individuals have an income above that level and hence would be able to afford it.
3. For the population that can afford this level, we assume that their expenditure is unaffected. For the remaining population, we calculate their average income, and the affordable expenditure level that results from that, subject to a minimum level of £100 per month.

4. For example, of individuals with an annual income less than £33,240, their average income is £21,154. Converting into monthly terms and multiplying by 10 per cent, we find that they could afford £176 per month on average.
5. In each bin, we multiply the proportion of unaffected accounts by the assumed expenditure level, and the affected accounts by the new limit. We use the same proportions symmetrically on the other side of the distribution.
6. For example, we assume that 43 per cent of 24,485 accounts continue to spend £277 in a month, while the other 57 per cent instead spends £176. Likewise, we assume that 57 per cent of players in the £200.01-£500 net *gain* bin instead only win £176.
7. We replicate this calculation for all bins greater than plus or minus £100, and calculate the percentage difference in total revenue with and without the affordability check.

A.3. Correlation of operating costs and online GGY

To estimate the relationship between variable operating costs and online GGY, we analyse the most recent two years' worth of financial results from four large gambling operators: William Hill, GVC, Flutter and Bet365.

Each of these operators present their GGY and operating profit associated with online gambling activity. The difference between GGY and EBITDA comprises (i) direct cost of sales, including RGD; and (ii) associated operating costs. While some separate their GGY between online gaming and online betting, none provide operating profit at this granularity, so we consider costs of online gaming and betting together.

By considering two years of data for each company, we can measure how direct costs and operating costs changed with GGY one year to the next. After subtracting the relevant level of RGD (15 per cent, 21 per cent or interpolated between them, depending on the year), we fit a linear function equal to a fixed component of operating costs (the intercept) plus a variable component (the slope).

In Table A.5, we give an example of this calculation based on William Hill's financial results in 2018-19 and 2019-20.¹⁰⁰ As the table shows, William Hill's online GGY increased by £65 million between the two years. In spite of an increase in the RGD rate from 15 per cent to 21 per cent, its operating profit increased slightly, implying that its operating costs must have increased by only £3 million. For William Hill, therefore, we find that its online operating costs are mostly fixed (58 per cent of 2019-20 GGY), with only a small proportion that is volume dependent.

¹⁰⁰ William Hill PLC (4 March 2021), Final Results 2020, p.8

Table A.5: William Hill Operating Cost Calculation

Index	Line Item	2018-19 (£m)	2019-20 (£m)	Source
A	Online GGY	738	803	2020 Annual Report
B = (15% or 21%) x A	RGD Contribution	111	169	Calculated
C	Operating profit	119	122	2020 Annual Report
D = A – B - C	Operating cost	509	512	Calculated
Coeff.(D, A) / A	Fixed operating cost		58%	Calculated
Slope (D, A)	Variable operating cost		6%	Calculated

Source: William Hill 2020 Annual Report, NERA Analysis

However, William Hill is only one firm out of four we assess. By contrast, Flutter's operating costs increased by more in percentage terms in between CY 2018 and 2019 than its online GGY, even after accounting for the increase in RGD. For Flutter, therefore, we find that it has a *negative* intercept and a correspondingly steeper slope. We therefore use an average across the four firms, weighted by their latest online GGY, shown in Table A.6.

Table A.6: Online Operating Costs as a Function of GGY

Variable	GVC	William Hill	Bet365	Flutter	Average
Online GGY (£m)	2,171	803	2,982	666	
Fixed Opex %	23%	58%	18%	-12%	21%
Variable Opex %	34%	6%	40%	62%	36%

Source: Gambling operators' financial reporting, NERA Analysis

We therefore assume that a £1 reduction in online GGY will also reduce operating costs by £0.36.

Qualifications, assumptions and limiting conditions

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