Written Evidence Submission

Decentralised Gambling Overview

Authors: **Oliver J. Scholten**, Dr James A. Walker, and Dr David Zendle

Email: ojs524@york.ac.uk Phone: XXXXX XXXXXX

Date: 04/09/2019

Address: Department of Computer Science, University of York, YO10 5GE

This submission is made in an individual capacity only.

Executive summary overleaf.

This document has since been accepted and [published by the House of Lords Select Committee](#). See [all committee publications here](#).

About The Authors

Oliver J. Scholten is a PhD student at the University of York. His studies focus on the analysis of gambling transaction data, including the data made available by decentralised gambling applications. He is the lead curator of the [York Gambling Transaction Set](#), and presented evidence of decentralised gambling prevalence to national academics at the [Current Advances in Gambling Research conference](#) [4] earlier this year.

Dr James A. Walker is a lecturer in Computer Science at the University of York. His expertise includes artificial intelligence, data analytics, and emerging forms of gaming entertainment including esports. He has overseen data curation above, and has [published several articles](#) on the analysis of gaming behaviours in leading conferences.

Dr David Zendle is also a lecturer in Computer Science at the University of York. His expertise include the prevalence of emergent forms of gambling, and he is regularly called upon to give oral evidence on emergent forms of gambling to government inquiries. His evidence provisions include the [USA Federal Trade Commission Public Workshop](#) on loot boxes, the [DCMS Select Committee Inquiry](#) on Immersive and Addictive Technologies, and the [Australian Senate Inquiry](#) on chance-based microtransactions.

Executive Summary

Decentralised gambling can be described as a type of online gambling. This submission evidences the form and prevalence of decentralised gambling applications, and shows how this information can help address several of the committee's questions.

Summary of key points:

1. Decentralised gambling applications typically operate without a licence
2. Age verification, nor any other consumer protection measures, are typically implemented by these applications
3. The online nature of these applications mean they can be accessed by anyone
4. The distributed nature of these applications makes their closure practically impossible
5. Academic work relating to decentralised gambling has been limited

These points provide evidence regarding three of the committee's questions;

Question 3: How successfully do the Gambling Commission, local authorities and others enforce licensing conditions including age verification?

Question 5: What are the social and economic costs of gambling?

Question 15: How are new forms of technology, including social media, affecting children's experiences of gambling?

Introduction

What is decentralised gambling?

1. Decentralised gambling, also known as blockchain gambling or crypto-gambling, is a type of gambling which uses cryptocurrency technology [1].

2. Decentralised gambling applications come in two parts. The first is a piece of computer code, referred to here as a **contract** [2], which accepts cryptocurrency and performs some chance based calculation. The second is a website which interacts with this code, referred to here as an **interface**. The contract is stored on the distributed computer network on which the accepted cryptocurrency operates [2]. The interface can be stored as any other website can. This means the contract performing the calculations is practically impossible to destroy or prevent from executing as it enjoys the same censorship resistant properties as the cryptocurrency it accepts. The interface (or any website) which interacts with a given contract is susceptible to regulatory intervention.

How popular is decentralised gambling?

3. In the **7 days** prior to the time of writing, approximately **\$13M** in cryptocurrency has been sent to decentralised gambling platforms globally. Charts showing the number and user activities of decentralised gambling platforms, from which these figures are sourced, can be found here: <https://www.stateofthedapps.com/stats/category/gambling>.

4. The top three decentralised gambling applications by weekly volume at the time of writing are BlueBet, Dice2Win, and EOSBet. The respective financial volumes sent to these applications are **\$3.7M**, **\$2.5M**, **\$1.4M** in the past week. As with the figures above these are globally aggregated and not easily divisible by country, although with cryptocurrency exchange data access, more specific figures may be possible.

What form does it take?

5. Decentralised gambling currently takes a number of forms. Most typically it includes simple casino games like dice rolls, coin flips, and other games of chance [3], although more advanced games like poker and blackjack are available. These games can be played by accessing the website part of the decentralised gambling application through a web browser. They can also be played by sending cryptocurrency funds to the contract described above without using the corresponding website. This is unlikely to be common as it is a somewhat technically advanced action to complete. Examples of the interfaces of the three top decentralised gambling applications can be found in the appendix below.

Who can use it?

6. Anyone, of any age, with access to the internet and some cryptocurrency can use decentralised gambling applications. Although some decentralised gambling applications present user agreements discouraging use from certain jurisdictions, there have been no technical barriers (e.g. IP address restrictions) found to prevent play in the most popular applications described above.

Evidence

7. Decentralised gambling applications present several problems. Their form and prevalence can address several of the committee's questions.

8. Firstly, with respect to the enforcement of licensing conditions (*Question 3*), only one of the top three decentralised gambling providers described above present licences on their interfaces. EOSBet presents the [Gaming Curacao licence](#), but is accessible in the United Kingdom without holding a UK Gambling license (to the author's knowledge). This means the issue does not arise at the enforcement of licensing conditions level, but at the enforcement of licenses themselves.

9. However, the Gambling Commission's enforcement capability is substantially impeded by the censorship resistant nature of the cryptocurrency technology used by these applications. This means that in terms of enforcement, the interface part of the application is the simplest area in which the Commission may exercise any operation limitations, as to affect the contract would require the modification of the entire cryptocurrency network on which the contract exists.

10. The economic costs (*Question 5*) of decentralised gambling cannot be directly calculated. However, the amount wagered through these applications can be calculated, albeit in global terms. These values, as presented above, may act as proxies for economic costs. Further work is required to understand this complex relationship, and to devise methods to present these values in national terms.

11. The online and unrestricted nature of decentralised gambling applications means that there are no theoretical limitations to the use of these gambling services by minors (*Question 15*). The lack of applied licencing conditions may compound this issue, however the ages of the users of these applications cannot practically be determined.

Conclusion

12. Decentralised gambling, as with other forms of online gambling, poses several regulatory, social, and economic challenges. Licencing conditions, as with the licenses themselves, appear unable to affect the operation of many decentralised gambling applications. This holds in both international and domestic terms. Unique to decentralised gambling is their two-part structure. The contract part of this structure in particular poses significant technical regulatory challenges.

13. The structure of these applications means that they are not completely immune to governmental intervention. The interface (website) part of these applications are technically easier to obstruct, and may be a fruitful avenue for intervention as required.

14. Finally, the scale at which these applications currently operate at means they may not draw the attention that more mainstream gambling methods do. For this reason little academic work has been done investigating them in any capacity.

References

- [1] Gainsbury, S.M. and Blaszczynski, A., 2017. How blockchain and cryptocurrency technology could revolutionize online gambling. *Gaming Law Review*, 21(7), pp.482-492.
- [2] Scholten, O.J., Hughes, N.G.J., Deterding, C.S., Drachen, A., Walker, J.A. and Zendle, D.I., 2019, August. Ethereum Crypto-Games: Mechanics, Prevalence and Gambling Similarities. In *CHI PLAY 2019*. ACM.
- [3] Scholten, O.J., Zendle, D. and Walker, J.A. (2019) Decentralised Gambling: The York Combined Transaction Set. Trans. [Internet] Available from osf.io/bvjwc.
- [4] Scholten, O.J., Zendle, D. and Walker, J.A. (2019) Decentralised Gambling: Data Abundance and Technical Concerns. Current Advances in Gambling Research, University of East London, 12th July 2019.

Appendix - Supporting Images

Figure 1. Dice2Win user interface, accessible through a web browser.

Figure 2. EOSBet's dice game user interface, also accessible through a web browser.

Figure 3. BlueBet Texas Hold 'Em user interface, accessible through a web browser.

		PLATFORM		CATEGORY							
		All platforms		Gambling							
#	?	Platform	Category	Users (24h)	?	Volume (7d)	?	Dev activity (30d)	?	User activity (30d)	?
302		BLUEBET First cross-chain spinach application	EOS	Gambling	155 +37.17%	1,146,897 EOS 3,746,913 USD +31.30%	-	-	-
759		dice2win Simple and fair dice game	Ethereum	Gambling	77 +37.50%	12,325 ETH 2,117,129 USD +23.56%	1 -50.00%	-	-
320		EOSBet Betting platform	EOS	Gambling	298 +19.20%	554,751 EOS 1,812,371 USD +130.27%	1 0.00%	-	-
1087		EOSPLAY Lottery and dice games	EOS	Gambling	28 -9.68%	383,119 EOS 1,251,648 USD +12.30%	-	-	-
474		20000Ethereum 20,000 crypto giveaway promotion	Ethereum	Gambling	87 +4.82%	6,780 ETH 1,164,676 USD -	-	-	-
140		Dapp365 Fair, fun and thrilling gambling game	EOS	Gambling	6,031 -0.13%	286,879 EOS 937,232 USD -44.90%	-	-	-
543		BetHash Bet on future blocks and earn a passive income	EOS	Gambling	111 -17.16%	221,063 EOS 745,883 USD +25.97%	-	-	-
437		Black Jack The most fair Black Jack, more than sexy dealer on	EOS	Gambling	219 -3.95%	137,293 EOS 448,537 USD -48.58%	-	-	-
664		EOSHash The fairest crypto casino built on EOS	EOS	Gambling	98 -19.01%	135,728 EOS 443,422 USD +123.62%	-	-	-
865		Etheroll Dice game	Ethereum	Gambling	19 -20.83%	2,463 ETH 423,123 USD -28.43%	-	-	-

Figure 4. StateOfTheDapps.com top gambling applications by 7 day volume, taken 05/09/2019.