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I. INTRODUCTION

Sports betting is nothing short of a booming industry. While there has never been a shortage of Americans eager to bet on sports, the practice was illegal in all states but Nevada, Delaware, Montana, and Oregon until 2018.[1] That was the year the Supreme Court held the Professional and Amateur Sports Protection Act ("PASPA") – the federal law banning sports betting – to be in violation of the Tenth Amendment of the Constitution. This spurred a flurry of state legislation legalizing sports betting, with at least 34 states now primed to legalize sports betting by 2022 and no indication the number will stop growing.[2] Even prior to the legalization

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2. Luke Lango, *The Sports Betting Boom Has Arrived*, INVESTOR PLACE (Sept. 17, 2021, 7:39 AM), https://www.investorplace.com/hypergrowthinvesting/2021/09/the-sports-betting-boom-has-arrived/.

of widespread sports betting in the United States, the global sports betting industry was estimated to be worth as much as $3 trillion.[3] There is every reason to think the rapid American legalization of the practice will only increase that figure, as Americans have legally wagered over $65 billion since the repeal of PASPA.[4]

The legal near-monopoly Nevada, and primarily Las Vegas, had in sports betting made them the most trusted and patronized actor in the industry for many years. Many people planned trips to the city for the sole purpose of wagering on sports. Las Vegas sportsbooks — the institutions that offer sports bets — were the authority that legal and illegal sportsbooks looked to in deciding what bets to offer.[5]

To be sure, the law did not completely curb sports betting in states which it was banned.[6] "Bookies," or individuals operating sportsbooks illegally, were and remain ubiquitous. There were also a number of "offshore" gambling websites based outside of the United States that would take bets.[7] The legality of these "offshore" gambling websites were more questionable, and their unregulated nature and occasional interactions with United States' law enforcement rendered their reliability suspect.[8] In any event, the number of people with a preference to not break the law betting on sports meant these practices never seriously threatened the profits of Las Vegas' sportsbooks.

The recent widespread legalization of sports betting now threatens Las Vegas' primacy, though sportsbook operators in the city hope their decades of legal operation has given them a reputation that will keep prospective bettors coming.[9] Still, while legalization has facilitated a

3. AFP, *Global Sports Gambling Worth 'Up to $3 Trillion',* DAILY MAIL (Apr. 15, 2015, 2:01 PM), https://www.dailymail.co.uk/wires/afp/article-3040540/Global-sports-gambling-worth-3-trillion.html.

4. Jim Sergent, *Six Charts Show Sports Betting's Digital Explosion with NFL Season about to Kick Off*, USA TODAY (Sept. 12, 2021), https://www.usatoday.com/in-depth/graphics/2021/09/09/online-sports-gambling-good-bet-industry-continue-winning-ways/5686836001/.

5. Will Hobson, *Sports Gambling in U.S.: Too Prevalent to Remain Illegal?*, WASH. POST (Feb. 27, 2015), https://www.washingtonpost.com/sports/sports-gambling-in-us-too-prevalent-to-remain-illegal/2015/02/27/f1088e4c-b7d3-11e4-9423-f3d0a1ec335c_story.html.

6. Adam Liptak & Kevin Draper, *Supreme Court Ruling Favors Sports Betting*, N.Y. TIMES (May 14, 2018), https://www.nytimes.com/2018/05/14/us/politics/supreme-court-sports-betting-new-jersey.html.

7. U.S. Attorney's Office for the Eastern District of Pennsylvania, *Offshore Internet Sports Betting Company Agrees to Forfeit Over $46.8 in Proceeds to Resolve Criminal Investigation*, DEP'T OF JUST. (Sept. 30, 2020), https://www.justice.gov/usao-edpa/pr/offshore-internet-sports-betting-company-agrees-forfeit-over-468-million-proceeds.

8. *Id*.

9. David Purdum, *Will Vegas Ever be the Same?*, ESPN (Feb. 13, 2018), https://www.espn.com/chalk/story/_/id/22411455/gambling-vegas-bookmakers-growing-concerns-impact-sports-betting-legalization.

decentralization of sorts, it has not yet eliminated or even seriously threatened the primacy of "houses" offering sportsbooks.

In the context of gambling, "the house" refers to the institution offering the game or bet. The familiar refrain "the house always wins" is the idea that institutions would not offer gambling-based games or bets that had rules or terms that, over a large enough sample size, would not facilitate profits. For the purposes of sports betting, "the house" is the sportsbook.

The legalization of sports betting has greatly increased the number of sportsbooks, some in the form of physical locations in states where sports betting is now legal, others in the form of newly legal websites that take bets from bettors in states where the practice has been legalized, such as FanDuel and DraftKings.[10] What legalization has not done is eliminate sportsbooks entirely, despite the theoretical potential for individuals to legally bet with other individuals under the new status quo.

There is a myriad of reasons why this is not an appealing option for the serious sports bettor, i.e., the sports bettor more ambitious than the average person who makes low-stakes friendly wagers with acquaintances. It requires one to find another individual willing to take the other side of a bet, willing to wager an amount of money commensurate with the terms of the bet, pay the transaction costs necessary to create a contract with this individual if they want a legally enforceable bet, and pay the transaction costs associated with subsequent litigation if the other party does not abide by those terms. Suffice to say, it is much easier to place a bet with a sportsbook that has already addressed all of these issues, even knowing that over a large enough sample size "the house always wins."

However, there is a rapidly developing technology that threatens to further decentralize the institution of sports gambling, and thus, threaten sportsbooks entirely: smart contracts on the Ethereum blockchain. The practice of sports gambling using smart contracts has the potential to render traditional American sportsbooks obsolete.

Part II of this article provides definitions of certain terms necessary to understand the argument. Part III explains why smart contracts on the Ethereum blockchain lend themselves well to sports bets. Part IV describes why this model could appeal to bettors. Part V will describe the potential roadblocks smart contracts face in supplanting sportsbooks as the primary means by which Americans place sports bets. Part VI will discuss potential solutions to those roadblocks. Finally, Part VII

10. John Milton, *History of Sports Betting*, BIG ON SPORTS (July 19, 2017), https://www.bigonsports.com/history-of-sports-betting/.

concludes with a discussion of the potential smart contracts have to disrupt the sports betting industry in light of all of the factors evaluated.

II. REVIEW OF TERMS

In order to understand the potential that smart contracts have to further disrupt the sports betting industry, it is necessary to understand a number of terms describing the relevant technology. Brief definitions for "the blockchain," "cryptocurrency," "Ethereum," and "smart contracts" are necessary to make this paper more comprehensible, with the caveat that more extensive definitions and descriptions of the terms exist elsewhere.[11]

The blockchain is a database that is publicly shared, or a "distributed ledger," that records time-stamped transactions.[12] Once a transaction is recorded, it cannot be altered. Every new transaction requires verification by a network of individuals, with most blockchains rewarding those who verify the transactions with that blockchain's cryptocurrency.[13] The identity of the individuals performing this verification differs depending on the blockchain in question.[14]

A cryptocurrency is a currency that exists only in digital form. Transactions using cryptocurrencies are recorded on the blockchain of the cryptocurrency in question.[15] The most popular cryptocurrency, Bitcoin, uses what is known as a "proof of work" system to verify transactions, while others, like Ethereum, use a "proof of stake" system to verify transactions.[16] The former allows anyone to solve a complicated math question, with the first party to solve the question being given the opportunity to verify the latest transactions and update the blockchain.[17] The latter system only allows individuals with sufficient holdings of the cryptocurrency in question to verify and update the blockchain in exchange for the reward.[18]

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11. Satoshi Nakamoto, *Bitcoin: A Peer-To-Peer Electronic Cash System* (2008); *see also* Vitalik Buterin, *Ethereum White Paper: A Next Generation Smart Contract & Decentralized Application Platform* (2013); *see also* Max Raskin, *The Law and Legality of Smart Contracts*, 1 GEO. L. TECH. REV. 305 (2017).

12. Phillip Stafford, *The FT crypto glossary*, FINANCIAL TIMES (Oct. 20, 2021), https://www.ft.com/content/df9f5795-2aaf-4088-a76e-304056db61ef.

13. *Id*. at 6.

14. *Id*.

15. *Id*. at 4.

16. *What Is "Proof of Work" or "Proof of Stake"?*, COINBASE, https://www.coinbase.com/learn/crypto-basics/what-is-proof-of-work-or-proof-of-stake (last visited Dec. 20, 2021).

17. *Id*. at 3.

18. *Id*. at 4.

While cryptocurrencies are quickly gaining recognition and legitimacy from private actors and governments, their appeal stems from their decentralized nature, which facilitates payments of almost any size without the involvement of financial institutions or other third-parties.[19] Some cryptocurrencies, called "stablecoins," peg their value to other assets and thus do not fluctuate in value to extreme degrees.[20] However, most cryptocurrencies do not do this, and thus, their value is constantly changing based on several factors.[21]

There is also an important distinction between "coins" and "tokens." Both are cryptocurrencies, but coins can only exist on one blockchain, referred to as their "native" blockchain, and are strictly used as currencies—they are simply alternative forms of money.[22] Tokens exist on blockchains already used by existing coins, and usually exist pursuant to a more specific purpose other than being currencies.[23] They hold value of their own, but have more limited utility than coins as they are issued pursuant to more limited purposes.[24] A simplistic but instructive analogy is the difference between fiat currency and gift cards. You can spend fiat currency on any good or service, while gift cards can be spent but only at a specific location. Importantly, anyone is free to exchange fiat currency for gift cards and vice-versa. The same is true for coins and tokens, as there are exchanges that facilitate these transactions.

Ethereum is one currently existing blockchain to which the coin "ether" is native.[25] Its developers intended to create a blockchain in which more complicated functions than simple bookkeeping can be performed, the most important of which for the purposes of this paper is the ability to code functions for self-executing future transactions.[26] The Ethereum blockchain hosts over 400,000 tokens, in addition to its native "ether" coin.[27]

Smart contracts are the programs which automatically execute these future transactions based on previously agreed upon terms.[28] In this sense,

19. Buterin, *supra* note 11, at 10.
20. Stafford, *supra* note 12, at 14.
21. *Id*.
22. *Id*. at 4.
23. *Id*. at 15.
24. Sabrina T. Howell et al., *Initial Coin Offerings: Financing Growth with Cryptocurrency Token Sales* (2018).
25. Stafford, *supra* note 12, at 6.
26. *Id*.
27. Nathan Reiff, *What Is ERC-20 and What Does It Mean for Ethereum?*, INVESTOPEDIA, https://www.investopedia.com/news/what-erc20-and-what-does-it-mean-ethereum/ (last updated Aug. 5, 2021).
28. Stafford, *supra* note 12, at 14.

they are no different than traditional contracts, except that the transfer of value from one party to another is automatic upon the occurrence of the terms requiring it.[29]

III. THE POTENTIAL FOR SMART CONTRACTS

In understanding why smart contracts have potential to displace sportsbooks, Professor Max Raskin's differentiation between "strong" and "weak" smart contracts is instructive. In Raskin's view:

> Strong smart contracts have prohibitive costs of revocation and modification, while weak smart contracts do not. This means that if a court is able to alter a contract after it has been executed with relative ease, then it will be defined as a weak smart contract…. If a court has power to interpret and then enforce a contract, then *it* is the smart actor and will abide by previous precedential rules and statutory frameworks. Traditional enforcers who are confronted with contracts that use technology, but ultimately rely on some form of alterable behavior, will be able to award damages, issue injunctions, or enforce criminal penalties to enforce their understanding of the law. For instance, consider a smart contract that requires a party to mow a lawn if funds are dispersed. And suppose the mechanism for enforcing the dispersal of funds was a sensor that measures the lawn's average grass length. Although one side of the contract could be automatically enforced, because the behavior of the human party is alterable by a court, i.e. a court can excuse performance, the contract will not necessarily execute. But traditional enforcers who are confronted with strong smart contracts will be helpless *ex post*.[30]

Using Raskin's definition, there can hardly be a smart contract "stronger" than a contract with terms that depend on objective criteria generated by actors who are not parties to the contract. One example of such criteria, most importantly for the purposes of this paper, would be outcomes in sporting events. This article uses the phrase "outcomes in sporting events" rather than "the outcome of a sporting event" due to the wide variety of events one can wager on, including the ability to wager on the outcomes of multiple games within a single wager.

This is because using the Ethereum blockchain, it is possible to code a function that automatically distributes either "ether" or a token to a party dependent on the outcomes in question.[31] Given the specificity of

29. Raskin, *supra* note 11, at 309.
30. *Id*. at 310-11.
31. Buterin, *supra* note 11, at 12.

this type of smart contract, courts would be reasonably less likely to interpret the terms of the contract differently than either party intended, and with the transfer of funds being automatic, courts would presumably be more likely to order specific performance.[32] Courts would be limited to voiding these kinds of contracts under rarely invoked doctrines such as unconscionability and duress.[33] But even these remedies would presumably occur after the transfer of funds has taken place, thus requiring the cooperation of the party to whom the funds were transferred.[34]

IV. THE APPEAL TO BETTORS

Of course, merely establishing that smart contracts lend themselves well to sports betting does little to prove that the technology may one day threaten sportsbooks. However, there is much about a decentralized, peer-to-peer system using smart contracts on the Ethereum blockchain that bettors may potentially find appealing. A completely decentralized peer-to-peer betting system would remove a factor from sports betting that frustrates current bettors and likely deters prospective bettors: the fact that the house always wins.

As previously mentioned, sportsbooks offer bets on terms they are certain will make them a profit over a long period of time.[35] They frequently are on the losing end of individual bets, but absent unprecedented statistical anomalies, sportsbooks will net profits if enough people place bets.[36] This is accomplished by offering bets on terms that attract a roughly equal number of bettors on both sides of the bet, and using the money gained from the losers to pay the winners.[37] Crucially, the terms of the bet are set accordingly for sportsbooks to retain a percentage of the winnings for themselves, usually around 10%, regardless of which side wins.[38] For this reason, a remarkably small percentage of repeat sports bettors make profits over a large enough sample size.[39]

There is also no negotiating with sportsbooks—they offer the same bets to all prospective bettors knowing they have plenty of customers, even if their terms deter some bettors. A bettor can have the terms altered,

32. William Murray Tabb et al., REMEDIES CASES AND PROBLEMS 113 (7th ed. 2020).
33. *Id*. at 202.
34. *Id*.
35. Wayne Parry, *Sports Betting May Seem Easy. It's Not. Here's Why*, ASSOCIATED PRESS (Jan. 2, 2019), https://www.apnews.com/article/nv-state-wire-north-america-wv-state-wire-mo-state-wire-mi-state-wire-8aa59feca7bf43ba9912e4ef524eee15.
36. *Id*.
37. *Id*.
38. *Id*.
39. *Id*.

but this comes at either a monetary cost or requires them to increase the risk profile of their side of the bet.[40]

A decentralized peer-to-peer system on the blockchain would allow bettors to shop around and negotiate for terms they are comfortable with. Regardless of the wisdom of those terms, bettors could be assured they are not specifically designed to take money from bettors. This option already exists between individuals without the use of any technology, but smart contracts on the Ethereum blockchain would facilitate fast connection between individuals seeking to be on the opposite end of any bet, and comes with the aforementioned automatic enforcement benefits.[41]

There are potential benefits such a system could have compared to sportsbooks that are more specific to the sports betting industry. Sportsbooks, which historically run consistent but tight profit margins, have often engaged in the practice of limiting or even prohibiting consistently successful bettors from continuing to use their services.[42] Considering that the number of bettors who profit on sports betting over a long period of time is already small, it is easy to see the conundrum this presents; a bettor is unlikely to be successful, and if they are too successful, they risk being banned from their preferred sportsbook. A decentralized betting system would have no incentive to engage in this practice, as there would be no institution with profits to protect.[43]

While conducting research for this paper, I discovered this was not entirely hypothetical. In 2018, a platform called "Bethereum" launched with an idea almost identical to that which I envision one day challenging the primacy of sportsbooks. Its founders referred to it as "…a decentralised, social-betting platform based on Ethereum technology and Smart Contracts,"[44] and further characterized existing betting options as "…a highly centralised endeavour, taking power away from the players and placing it in the hands of bookmakers."[45] The founders of Bethereum ambitiously said they "…aim[ed] to become the leading social betting platform on the market."[46]

40. *Id*.

41. Buterin, *supra* note 11, at 12-13.

42. David Hill, *Requiem for a Sports Bettor*, THE RINGER (June 5, 2019, 6:20 AM), https://www.theringer.com/2019/6/5/18644504/sports-betting-bettors-sharps-kicked-out-spanky-william-hill-new-jersey.

43. Buterin, *supra* note 11, at 13, 18.

44. BETHEREUM, BLOCKCHAIN-POWERED SOCIAL BETTING, https://www.bethereum.com/Bethereum-Whitepaper-EN.pdf. (last visited Mar. 3, 2022).

45. *Id*. at 4.

46. *Id*.

In addition to outlining the advantages such a platform could have over traditional sportsbooks, the founders of Bethereum argued that traditional sportsbooks "…have generally disregarded [gamification], dismissing such features as achievements and leaderboards as trivial videogame fanfare."[47] Gamification is "the application of game design principles and techniques to non-gaming contexts."[48] The founders of Bethereum posited "…gamification is an absolutely critical source of competitive advantage in the online betting space. Bethereum will therefore make extensive use of individually and socially oriented game design techniques to deliver the most engaging and rewarding betting experience in the industry."[49]

The platform was to exist on the Ethereum blockchain, and bettors were to place their bets with a token called "Bether."[50] The supply of Bether was to be capped at one billion tokens, 60% of which were sold in an initial token sale where Bether could be purchased in exchange for Ether, 20% of which were given to Bethereum's "core team members," 12% of which went into Bethereum's long term budget and were "…primarily used to finance incentive schemes for new employees or attractive extra-budgetary opportunities," 5% of which were allocated to cover the costs of the token sale (including "…commissions and fees paid to marketing and promotional partners…"), and 3% of which were set aside to fund a "Bounty" system where Bether would be distributed to bettors who won bets against accomplished bettors on the Bethereum platform.[51]

While researching the advantages a peer-to-peer system that uses smart contracts on the Ethereum blockchain may have over sportsbooks, I wanted to hear the thoughts of someone currently involved in the sports betting industry. I spoke with a board member of a well-known publicly traded sports betting company, who has extensively dealt with issues surrounding sports betting in this capacity.

He agreed that there is potential in such a system, pointing out that sportsbooks incur high costs from risk-management staffing (risk managers working for sportsbooks are charged with ensuring that the terms of their bets do not expose the sportsbook to more financial liability than they can handle) and credit card fees in which they have no choice but to pass on to bettors in the form of unfavorable betting terms. A peer-to-peer system could theoretically eliminate both costs, as there would be

47. *Id*. at 23.
48. *Id*.
49. *Id*.
50. BETHEREUM, *supra* note 44, at 27.
51. *Id*. at 27-28.

no need for risk management due to users being the parties which incur the risks on bets, and the use of tokens such as Bether eliminates credit card fees. Accordingly, the fees a decentralized system would pass on to users would be minimal.

V. THE ROADBLOCKS

At a minimum, the first attempt to displace sportsbooks using smart contracts on the Ethereum blockchain has not gone as planned. After setting ambitious goals, winning prestigious awards,[52] and being featured on CNBC,[53] the Bethereum project appears to be somewhere on the spectrum between delayed and defunct. When one clicks on the "Bethereum Platform" section of the Bethereum website, the result is a message stating "[w]e're taking a break to further develop our platform and reorganize our operations. Please check our Telegram channel for updates."[54] As of March 2022, the last update posted on the platform's Telegram channel was from March 31, 2020.[55]

Perhaps more worryingly, the platform's token, Bether, is currently trading at prices that can only be described as negligible—a token can be purchased for $0.000556 as of April 2022.[56] Additionally, there are currently under 8,000 total holders of Bether, and a single token holder owns nearly 43% of all the tokens.[57] This indicates problems with the platform that go beyond mere maintenance.

Bethereum would not be the first startup to rebound after a launch that did not go as planned. More importantly, the failure of one sports betting startup that plans to utilize smart contracts on the Ethereum blockchain does not indicate that the idea itself lacks promise. However, no discussion of the potential of this technology would be complete without a discussion of the limitations it could have in challenging the primacy of sportsbooks.

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52. *Bethereum Won Best Pitch Award at Hype Sports Innovation 2019 in N.Y.*, MEDIUM (Sept. 19, 2019), https://www.medium.com/bethereum/bethereum-won-best-pitch-award-at-hype-sports-innovation-2019-in-ny-4cffd27e368a.

53. Bethereum Team, *Bethereum Advancements TV Episode on CNBC*, YOUTUBE (Dec. 16, 2018), https://www.youtube.com/watch?v=F3Jnz4kp-CQ&ab_channel=BethereumTeam.

54. *Maintenance*, BETHEREUM, https://www.gaming.bethereum.com/ (last visited Mar. 3, 2022).

55. *Bethereum News*, TELEGRAM, https://www.t.me/s/BethereumNews/174 (last visited Mar. 3, 2022).

56. *Bitcoin Exchange*, COINTIGER, https://www.cointiger.com/en-us/#/trade_center?coin=bether_usdt. (last visited Mar. 3, 2022).

57. *Token: Bethereum*, ETHERSCAN, https://www.etherscan.io/token/0x14c926f2290044b647e1bf2072e67b495eff1905#balances (last visited Mar. 18, 2022).

To start, there is the basic issue of familiarity. While the widespread availability of legal sports betting in the United States is a recent development, the practice of wagering fiat currency with a sportsbook has existed for decades in the United States and even longer in other countries.[58] At a bare minimum, it will take time for another form of sports betting to gain prominence. The concept of cryptocurrency is still relatively new, and recent polls of Americans indicate widespread hesitance to purchase cryptocurrency for any purpose.[59] The founders of Bethereum could optimistically argue they were simply too early, but there is no doubt cryptocurrency has a long way to go before being widely accepted.

There are factors more specific to the sports betting industry that may cap the potential. Smart contracts must disrupt the industry as well. Bettors using a peer-to-peer betting system may have trouble finding people willing to take the other side of the most popular bets currently placed with sports books. This is because some of the most popular types of sports bets are those which allow the bettor to take on minimal risk with the prospect of a high reward in the unlikely event their bet is successful.

One such bet is the "parlay," which allows the bettor to roll multiple independent bets into one large bet in which the bettor does not win unless they win every independent bet in the parlay.[60] For example, a bettor can bet on the outcome of six different football games, and if they choose to make this bet a parlay, they will lose the bet unless they are correct about the outcome of all six games. The reason so many bettors are willing to lower their odds of winning bets in this fashion is simple; if they are in fact successful, the monetary reward is often much higher than the amount of money they wagered. To use an extreme example, one bettor placed 12 separate bets on different golf matches during the 2021 Ryder Cup and decided to parlay them.[61] The bettor wagered $8 and won $966,290 when he shockingly won all 12 bets.[62]

Another example of a low-risk, high-reward bet is one that simply requires the bettor to bet on a single highly unlikely event. Prior to the 2016 English Premier League season, a woman placed a $14 bet on

58. John Milton, *History of Sports Betting*, BIG ON SPORTS (July 19, 2017), https://www.bigonsports.com/history-of-sports-betting/.

59. Javier E. David, *Bitcoin: Americans Know About Cryptocurrency but Most Aren't Interested in Investing*, YAHOO (July 26, 2021), https://www.news.yahoo.com/bitcoin-risky-americans-poll-132536189.html.

60. Parry, *supra* note 35.

61. SportsHandle, *Parlay Bets That Overcame Long Odds and Paid Big*, SPORTSHANDLE (Jan. 7, 2022), https://www.sportshandle.com/7-parlay-bets-that-overcame-long-odds-and-paid-big/.

62. *Id*.

Leicester City to win the league's championship.[63] When the team shocked the world and won the championship, her payout was $72,480.[64]

Sportsbooks have strong institutional incentives to accept these kinds of bets despite their low-risk, high-reward nature to the bettor. First, because sportsbooks accept so many of these kinds of bets, the small wagers add up and help offset the losses in the rare event such a bet is successful.[65] The number of losing bets sportsbooks receive, combined with the aforementioned fact that betting odds are always in their favor, means they have the ability to payout these rare but massive winnings.[66] Second, sportsbooks need to maintain their primacy in the sports betting market, and thus, are further incentivized to accept these popular bets.[67]

Other bettors using a peer-to-peer system have no such incentives.[68] A sportsbook can cover a near million-dollar payout on an $8 wager using the profits they accumulate from other bets, but a lone bettor is much less likely to be able to do so. For this reason, absent incentive structures that encourage bettors to take the other side of low-risk, high-reward bets, bettors using a peer-to-peer system on the Ethereum blockchain are likely to struggle finding takers for some of the most popular sports bets that exist.

However, this does not necessarily foreclose the potential for a peer-to-peer system to threaten the market share of sportsbooks. It still stands to reason that bettors may prefer such a system for bets in which both parties take on a more evenly distributed amount of risk. However, it is a mistake to assume that a large number of bettors would place their low-risk, high-reward bets with a sportsbook, and their more risk-neutral bets using a peer-to-peer system. This can be understood with one of the most well-documented principles of consumer behavior: brand loyalty.[69] The principle can be summarized as standing for the proposition that once consumers attach a positive association to a brand, it will become difficult for a competitor to "lure them away," even if the competitor offers objective advantages.[70]

63. Roger Gonzalez, *A Woman Won a 5000-to-1 Bet on Leicester City Made for Her as a Joke*, CBS SPORTS (May 5, 2016, 10:58 AM), https://www.cbssports.com/soccer/news/a-woman-won-a-5000-to-1-bet-on-leicester-city-made-for-her-as-a- joke/.

64. *Id*.

65. Parry, *supra* note 35.

66. *Id*.

67. Lambert, *supra* note 1.

68. Buterin, *supra* note 11, at 25, 34.

69. Carol M. Kopp, *Brand Loyalty*, INVESTOPEDIA (June 30, 2021), www.investopedia.com /terms/b/brand-loyalty.asp.

70. *Id*.

This does not mean it is impossible for consumer loyalty to be shaken. The thesis of this article posits that this is possible, and history is littered with examples of once-thriving brands and industries that eventually lost much or all of their market share to innovative competitors.[71] However, as roadblocks for such competitors increase, it stands to reason that consumer loyalty becomes more difficult to shake. Not being able to use a peer-to-peer system to place low-risk, high-reward bets is a significant roadblock which may lead bettors to stick with the sportsbooks they are familiar with for all bets, even though a peer-to-peer system may offer benefits in the context of other types of bets.

Furthermore, assuming the sports betting industry could seamlessly countenance a shift in which bettors continue to place their low-risk, high-reward bets with sportsbooks but place more risk-neutral bets using a peer-to-peer system, the approach would be incompatible with the current economics of the industry. Sportsbooks need to use the profits they make from all bets to cover their losses on low-risk, high-reward bets.[72] If they were to lose a significant portion of their risk-neutral bets to a peer-to-peer system, it is extremely likely they would not be able to operate profitably and would shut down. This would leave bettors with limited options for placing low-risk, high-reward bets, and this vacuum would likely lead to the re-emergence of sportsbooks sooner rather than later.

The board member I spoke with agreed that facilitating low-risk, high-reward bets could pose a problem for a peer-to-peer system and made the important additional point that the legal status of such an operation would pose additional difficult questions. Regulatory issues surrounding sports betting have become a major issue in light of the rapid legalization of the practice, and all states have their own requirements in terms of licensing, taxes, and other forms of maintenance.[73] Recently, New York granted licenses to nine sportsbooks on the condition that their revenues are taxed at a 51% rate.[74] This could theoretically advantage a peer-to-peer system, as it would not generate revenues based on bets and could thus avoid such tax rates. A 51% tax rate is considered very high

71. *Id*. at 3.

72. Parry, *supra* note 35.

73. Ward Williams, *Sports Betting Laws by State*, INVESTOPEDIA (Mar. 2, 2022), https://www.investopedia.com/sports-betting-laws-by-state-5219064.

74. Chris Bengel, *New York Gaming Commission Awards Licenses for Nine Sportsbooks*, CBS SPORTS (Nov. 8, 2021, 4:18 PM), www.cbssports.com/general/news/new-york-gaming-commission-awards-licenses-for-nine-sportsbooks/.

for the industry as the median is 11%,[75] but there is presumably no rate a peer-to-peer system could comply with given the lack of revenue generated from bets on the platform.

However, it also reveals a problem such a system could encounter in trying to comply with any state's regulations. State regulations may presuppose a sports betting operation is a traditional sportsbook and thus, the state's regulations are written accordingly. It is unlikely any state's gaming commission would allow a peer-to-peer system to be untaxed due to the technicality of the system not generating revenue from bets, because the very reason states are rapidly legalizing the process is due to the potential for tax revenue generation.[76] If a peer-to-peer system argued that it should be regulated via the rules of another kind of operation, states would likely act quickly to foreclose this argument as they would see it as a threat to sports betting tax revenues.

A peer-to-peer system would thus have two choices. It could seek to comply with a state's sports betting regulations, which would present massive challenges for an operation that does not generate much in the way of revenue. Contrarily, a peer-to-peer system could be based in another country with much laxer restrictions on sports betting. This is the approach taken by the aforementioned offshore sportsbooks, and while the advantages of avoiding American regulations are clear, it also comes with the potential to turn off bettors who would prefer not to engage with a system mired in ambiguous legality.[77]

VI. POTENTIAL SOLUTIONS

If bettors have difficulty placing low-risk, high-reward bets using a peer-to-peer, smart contract-based system on the Ethereum blockchain, the potential such a system has to disrupt the sports betting industry is limited. However, this does not necessarily have to be the case. It would behoove the founders of a peer-to-peer betting system to think of ways to facilitate these bets.

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75. Will Yakowicz, *New York Picks Nine Operators to Launch State's $1 Billion Sports Betting Market*, FORBES (Nov. 8, 2021, 5:42 PM), www.forbes.com/sites/willyakowicz/2021/11/08/new-york-picks-draftkings-fanduel-and-others-to-launch-states-mobile-sports-betting-program/.

76. Ulrik Boesen, *States Continue to Bet on Sports*, TAX FOUNDATION (Jun. 17, 2021), https://www.taxfoundation.org/states-sports-bettingtax/#:~:text=Due%20to%20their%20narrow%20base,economic%20activity%20and%20job%20creation.

77. Michael Stevens, *Can You Get Arrested for Gambling Online?*, GAMBLINGSITES (May 26, 2020), https://www.gamblingsites.org/blog/can-you-get-arrested-gambling-online/.

One potential solution would be for the application itself to maintain substantial financial reserves for the purpose of taking bets when a user cannot find a willing betting partner. This could be done through a combination of direct investment from the founders, crowdfunding, and user fees. However, this approach would mean the peer-to-peer system that adopted it would begin to resemble the very sportsbooks it is trying to displace.

The appeal of a peer-to-peer system lies in its promise to decentralize the betting process, thus removing the transaction costs that come with placing a bet with a centralized institution. If the application is tasked with maintaining substantial financial reserves, it will have no choice but to offer bets on terms that facilitate profits—one of the main elements of sportsbooks the proponents of a peer-to-peer system would almost certainly cite as evidence of a peer-to-peer system's superiority.[78]

Furthermore, if these reserves are maintained via user fees, this would mirror the way sportsbooks only offer bets on terms such that they make 10% of the winning regardless of the outcome. This practice is effectively a user fee on bettors, and this approach of a peer-to-peer system needs to be avoided.

For these reasons, a more compelling approach would be to incentivize bettors using the application to take the riskier side of bets. This would maintain the decentralized, peer-to-peer aspect of a system that uses smart contracts while solving one of the primary impediments currently facing such a system. This could be done by maintaining a large percentage of the application's tokens to use as rewards for bettors who take the riskier side of bets. Thus, if those bettors win, they would get both the winnings from their partner and bonus tokens.

Just how many tokens were awarded would depend on how much risk the bettor accepted. For example, bettors who accepted bets in which the odds were only marginally not in their favor would be rewarded very lightly, perhaps with a fractional token. Bettors who took on an amount of risk more commensurate with the aforementioned examples of low-risk, high-reward bets would be rewarded substantially.

This system could work well for some time, but there would still be a need to solve the problem of scarcity. The value of coins, tokens, and other forms of currency comes from their finite nature. This is the reason Bitcoin inventor Satoshi Nakamoto capped the number of minable Bitcoins at twenty-one million,[79] and why the founders of Bethereum

78. Parry, *supra* note 35.

79. Adam Hayes, *What Happens to Bitcoin After All 21 Million Are Mined?*, INVESTOPEDIA (Feb. 15, 2022),

planned on capping the number of Bether tokens at one billion.[80] Once all the tokens reserved for rewards are distributed to bettors, continuing to incentivize bettors to take the riskier side of bets would become a challenge. Once again, this could be remedied by replenishing the reserve fund via user fees, but as previously mentioned, that would likely negate many of the potential advantages of a peer-to-peer system.

One potential but risky solution to this problem would be relying on user donations made toward the reward fund once the initial reserves are depleted. It is possible that users of a peer-to-peer system would have enough of an interest in its continuing success, such that some percentage of users would willingly donate some of their tokens into the reward reserves to make sure the system could be maintained. The limitations of this solution are obvious—there is no guarantee enough donations could be secured to maintain a substantial reward fund, and this is essentially a user fee by other means. It could be argued that if enough users donated, the effective user fees would still be smaller than those associated with betting via sportsbooks. While this might be the case, there would be a collective action problem in securing donations on a large scale.

The system could also take a percentage of only the largest winnings and use that to fund the reward reserves. This would be a user fee, but one unlikely to affect the majority of bettors who likely would not be placing bets large enough to find themselves subject to the fee. Of course, the risk with this proposal lies with bettors seeking to place large bets and taking their business to sportsbooks knowing their potential winnings face no such tax. If a peer-to-peer system cannot attract bettors willing to make large bets, its potential to challenge sportsbooks becomes severely limited.

Overall, the challenge of facilitating low-risk, high-reward bets using a peer-to-peer betting system on the Ethereum blockchain is significant but not intractable. There are several potential solutions, all of which have unique benefits and risks. There has also been much innovation in the blockchain and digital currency space, such that it would be naïve to write off the possibility that currently unknown solutions to this problem are determined. If someone is able to put together a peer-to-peer betting system that uses smart contracts on the Ethereum blockchain and is able to figure out how to incentivize users of the system to take the riskier side of low-risk, high-reward bets, there are many reasons to think such a system could pose a serious challenge to the primacy of sportsbooks in the sports betting market.

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www.investopedia.com/tech/what-happens-bitcoin-after-21-million-mined/.

80. BETHEREUM, *supra* note 44, at 27.

As for the regulatory issues, it is realistically quite likely that a peer-to-peer system could be based overseas without facing the issue of deterring bettors. Prior to the widespread legalization of sports betting in America, plenty of American bettors placed bets with offshore sportsbooks.[81] While it is true that with everything else being equal, American bettors would likely prefer to deal with gambling operations that do not pose any legal issues, the advantages posed by a peer-to-peer system would almost certainly overwhelm this sentiment. This is because the legal issues in question pose very little threat to bettors themselves—prior to widespread legalization, instances of bettors patronizing offshore sportsbooks were almost never prosecuted, and in the rare instances in which they were, they tended to involve activity that went beyond mere betting.[82]

The operator of a peer-to-peer system, on the other hand, may face more legal liability. However, it is far from clear if this would be the case as prior prosecutions of offshore sports gambling operations have relied on the fact that they operated as sportsbooks—in other words, they "accept[ed] bets."[83] A peer-to-peer system would not be subject to this kind of liability, as it would not take bets—all bets would be made between users of the system.

VII. CONCLUSION

Discussions about the long-term potential for blockchain and digital currency technology often feel like they are between one camp that insists it is nothing but a fad that will be irrelevant in a few years, and another that insists it represents the singular future for currency in general. Neither argument is particularly persuasive, and the stubbornness of both arguments' proponents drowns out far more productive conversations about the potential of this technology. Realistically, the most likely future for this technology is that it gains a strong, permanent foothold in various industries in which it offers substantial benefits over the use of fiat currency, while not coming particularly close to displacing fiat currency entirely.

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81. Brett Smiley, *What Legal Sports Betting in the United States Means for Offshore Sportsbooks*, ESPN (July 7, 2018), https://www.espn.com/chalk/story/_/id/24028247/what-legal-sports-betting-united-states-means-offshore-sportsbooks.

82. Michael Stevens, *Can You Get Arrested for Gambling Online?*, GAMBLINGSITES (May 26, 2020),
https://www.gamblingsites.org/blog/can-you-get-arrested-gambling-online/.

83. Stan Fox, *History of Online Gambling Arrests & Criminal Charges*, LETSGAMBLEUSA (Nov. 24, 2021),
www.letsgambleusa.com/history-of-online-gambling-arrests-criminal-charges/.

There are many reasons to believe sports betting is one such industry. There are significant drawbacks to the use of traditional sportsbooks, such as odds being skewed in favor of the sportsbooks, limitations being placed on successful bettors, and the inability to negotiate the terms of bets. A peer-to-peer sports betting system that used smart contracts on the Ethereum blockchain at least theoretically could address these issues, and sports betting lends itself well to smart contract technology due to the objective nature of sports bets.

This does not mean the demise of sportsbooks is inevitable, and the experience of Bethereum, at least thus far, shows it will not be easy to displace their primacy in the industry. For all of their flaws, bettors are familiar with sportsbooks, and are not asked to familiarize themselves with new technology in order to continue using them. Furthermore, the rapidly increasing legalization of sports gambling has allowed sportsbooks to advertise their services in ways that were unfathomable just a few years ago. What was once viewed as an illegal, discouraged vice is now commonly celebrated by celebrities and professional athletes on television and internet advertisements with large audiences. It is quite possible sportsbooks are on the verge of their golden age as opposed to facing imminent demise.

At the same time, it is also possible more people using sportsbooks will hasten frustration with their aforementioned drawbacks for bettors. If bettors begin to seek out alternatives, it is hard to imagine one with more potential than a peer-to-peer system that uses smart contracts on the Ethereum blockchain.