



Playing by the rules: Government regulation and consumer trust in the online poker industry

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ABSTRACT

This study examines how government regulation can affect consumer trust and the perceived value of digital services. Data from interviews, a focus group, and a discrete choice experiment conducted by online poker players find that regulation significantly increases the amount players are willing to pay to play online poker and that the size of this regulatory premium differs according to player attitudes. Players are willing to pay an extra \$1.83 per hour to play on government-regulated sites and players who view these sites as more secure are willing to pay even more. However, the size of the regulatory premium falls and, in some cases, becomes negative when players believe that government regulation increases the likelihood that their winnings will be taxed. The study also finds lingering effects of the Unlawful Internet Gambling Enforcement Act, which made it difficult for players to manage funds on unregulated sites. Players who think regulation eases these transactions are willing to pay more. Interestingly, government regulation seems to offer an assurance against future government disruptions in the market. Our findings contribute to the understanding of trust-building mechanisms in online services, highlighting the complex effects of government regulation in complementing private measures.

There was another great thing about playing in Las Vegas: it was relatively safe ... I didn't need to carry a gun anymore, and when I won money, I knew that I could walk out the door with it. And unlike Texas, where the cops could raid the game at any time ... the cops in Las Vegas actually protected the games. Now, that was a feeling of security I'd never experienced.

- Doyle Brunson, *The Godfather of Poker*

1. Introduction

In its early history, the U.S. online-poker industry was an open market where players had access to unregulated platforms and players relied on firm reputations, market signals, industry news, and their own experiences to gauge the fairness of games and platform integrity. Consumers had to continually assess whether poker sites were willing to defraud their customers and whether users were being targeted by colluding opponents or bots posing as human players (Goodman, 2014; McMullan, 2012; Philander & Abarbanel, 2014).

In 2006, the U.S. passed the Unlawful Internet Gambling

Enforcement Act to curb the growth of online gambling. The act made it difficult for players and operators to process payments by prohibiting transactions from U.S. financial institutions to illegal gambling websites (Levitt & Miles, 2014). As a result, many online poker operators left the U.S. market, but some persisted, arguing that online poker was a game of skill and therefore not illegal in most jurisdictions (Levitt & Miles, 2014; Nevill, 2013). On Friday, April 15, 2011, in an enforcement action colloquially known as "Black Friday", the Department of Justice indicted the three largest U.S.-based operators. In doing so, it seized \$34 million from over 27,000 accounts and it would take more than three years to return the funds to players (Nevill, 2013; U.S. Attorney's Office, Southern District of New York 2012). Later that same year, the Department of Justice revised its opinion on Internet gambling and allowed states to offer online poker through state regulated processes (Seitz, 2011).

Consumer trust in digital businesses is influenced by a range of factors, including perceived privacy, site quality, familiarity, transparency, and self-regulation efforts (Gefen, 2000; Gefen et al., 2008; Kim & Peterson, 2017). However, little is known about the scale to which government regulations affect consumer perceptions of trust and

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product value. This is surprising, as many heavily regulated industries evolved out of largely unregulated markets. For example, ride-sharing (Collier et al., 2018; Lesteven & Godillon, 2020), fantasy sports (Holden et al., 2020), and cryptocurrency exchanges (Arner et al., 2023) are each recent examples of markets whose growth was predominantly led by unregulated firms that later became regulated.

Markets struggle to maximize social welfare when market imperfections impede the ability of market participants to execute mutually beneficial trades. Government regulations that, among others, reduce transaction costs, internalize externalities, and solve problems of asymmetric information may offer distinct advantages over the private measures used to create trust (Mueller et al., 2023). The legal enforcement of operational standards, management background checks, and the formal adjudication of customer complaints are all features that may operate better in regulated markets. For instance, the imposition of formal regulations benefitted the casino industry after a long history of organized crime involvement (Bernhard et al., 2008; Schwartz, 2013). The imposition of taxes, entry barriers, onerous compliance procedures and other regulations, however, can increase costs, affect the products supplied by regulated and unregulated entities and, more generally, impede the market's ability to create value.

Regulations improve social welfare when the benefits of regulation outweigh their costs. This study adds to the digital services and trust literature by examining the effects of state regulation and private security measures on the online poker market, focusing on regulations and private security measures that protect the integrity of games and the security of player deposits. The paper uses qualitative data collected from a focus group and three interviews with online poker players, along with a discrete choice experiment (DCE) conducted on a diverse sample of professional and recreational online poker players, to estimate the amount online poker players are willing to pay to use regulated sites and sites that include privately provided security measures.

Oversight in the online poker industry is characterized by a patchwork of regulatory regimes that range from strict government regulation that licenses platforms and imposes rigorous standards for fund management, identity verification, and technical audits to unregulated websites that employ more opaque safeguards against fund misappropriation and/or cheating. This dichotomy presents a critical question: To what extent does government regulation influence players' willingness to pay for online poker, and how do regulatory assurances compare with or enhance private strategies like third-party certifications or site security features?

This paper makes three primary contributions to the literature on digital services, trust, and regulation in the context of online poker: First, we provide a clear empirical estimate of the "regulatory premium" that players are willing to pay for government-regulated platforms. While prior studies have highlighted the importance of trust and perceived security in e-commerce and digital services (e.g., Gefen et al., 2008; Kim & Peterson, 2017), few have quantified the effects of regulation on the amount consumers are willing to pay for an online product. By identifying concrete dollar values, we add a tangible, order-of-magnitude measure that sharpens our understanding of trust's economic significance in this domain.

Second, we leverage qualitative data to describe a nuanced set of factors online poker players consider when choosing between regulated and unregulated sites. Prior analyses of trust generally focus on general antecedents like privacy policies or brand reputation (e.g. Chen & Dibb, 2010). Our qualitative findings provide richer, more context-specific insights, showing how perceptions of deposit and withdrawal convenience, site integrity, and tax liability shape player attitudes. In doing so, we provide a more holistic view of the drivers behind trust formation in an environment often characterized by uncertainty and asymmetric information.

Third, we isolate and compare the relative importance of private security measures and government oversight as separate trust-building mechanisms in online poker. Our framework highlights the

compensating variation players assign to different features. By calibrating the trade-offs they make, this study advances understanding of the interplay between private and public trust signals. We show points at which private efforts and regulation are valued, informing both theoretical models of trust (McKnight et al., 2002) and practical policy discussions on how best to structure oversight in digital markets.

2. Conceptual background

2.1. Private security measures and trust

The multidimensional web trust model proposed by McKnight et al. (2002) suggests that trust plays a central role in influencing purchase intention, primarily through the mediation of perceived risk and perceived benefit. Perceived risk refers to the uncertainty and potential negative consequences associated with engaging in an online transaction, such as financial losses or privacy breaches (McKnight et al., 2002). In the context of online services, consumers often perceive a higher level of risk due to the intangible nature of the services and the lack of physical interaction with service providers. The model suggests that trust can help mitigate these perceived risks. Providers can engender trust and reduce perceived risk by making investments and committing to policies that increase the return they receive from taking actions that are in the best interest of consumers (Klein & Leffler, 1981; McKnight et al., 2002).

Several antecedents of consumer trust in online environments are identified in the management literature. Among them, security measures are noted to have a significant impact on consumers' trust and willingness to engage with online service providers (Kim et al., 2008; Malhotra et al., 2004; Teo & Liu, 2007). Empirical studies highlight the role of secure payment methods and transparent privacy policies in building consumer trust (Chen & Dibb, 2010; Teo & Liu, 2007).

Typical management advice focuses on building trust through provision of assurance statements to consumers (Gefen et al., 2003; Wang & Emurian, 2005), establishing infrastructural signals like security and third-party certification (Biglaiser et al., 2020; Kim & Peterson, 2017; Lee & Turban, 2001; Lizzeri, 1999), and creating indirect signals, such as site quality and firm size (ter Huurne et al., 2017; Kim & Peterson, 2017; Klein & Leffler, 1981; Román et al., 2023). In networks where users can destroy value by behaving opportunistically, platform-based business can add value by improving trust among users (Moriuchi & Takahashi, 2022). This may include transaction guarantees, authentication of merchandise or merchants, or mediating disputes (ter Huurne et al., 2017). Theoretical research finds that trust can emerge as an equilibrium strategy for investors in a dynamic game when the conditioning of investor decisions on the trustworthiness of project managers allows investors and trustworthy managers to form effective alliances (Liu & Chen, 2022). Liu et al. (2023) show that governments can facilitate the creation of trust by developing reporting mechanisms and incentive schemes that reward investors for reporting untrustworthy managers and punish untrustworthy managers.

Online poker platforms use many of these trust-building strategies. For instance, gambling sites often highlight the legitimacy of their operations by using third-party seals (Gainsbury et al., 2013), which can influence consumers' trust in websites (Kim et al., 2008; Özpolat & Jank, 2015). The presence of security measures that reduce perceived risk and demonstrate good safeguarding practices, like encrypted security tokens, are likely to improve consumer trust and thereby increase purchase intention (Kim & Peterson, 2017).

2.2. Government regulation

While site-security features can reduce perceptions of risk, the basic premise that we put forward is that regulation can further enhance site security and influence risk perceptions. This can occur through four broad mechanisms in gambling industries (Laffont & Martimort, 2009):

First, government monitoring and mandated processes (e.g. cash reserve requirements) decrease opportunities for bad faith behavior. Second, intensive background checks for owners and senior management reduce the potential number of bad actors. Third, the threat of punishment through criminal or civil litigation disincentivizes fraudulent or negligent behavior. And fourth, regulatory agencies create a warranty on transactions by providing an outlet for consumers to provide complaints and receive remediation through a due process. Each of these traits are consistent with a framework that enhances institutional trust and value for consumers (Lu et al., 2021; McKnight et al., 2002; Tang, & HuSmith, 2008).

However, in addition to its effects on consumer perceptions and trust, a switch from an unregulated to a regulated setting can also affect prices and product features by promulgating rules that create barriers to entry and imposing regulatory burdens that increase costs. Entry barriers increase prices by creating market power but can also shift demand from unregulated providers to regulated providers. In our setting, the Unlawful Internet Gambling Enforcement Act's constraints on financial transactions increases the demand for regulated online poker by making it relatively more difficult to deposit and withdraw funds from unregulated providers (Gainsbury et al., 2018).

Consumers often hold concerns about their data privacy such as unauthorized access, control over personal information, and government surveillance (Martin, 2018). Player perceptions that regulation gives government officials access to players' personal information may decrease the demand for regulation if players perceive that it will increase the likelihood that poker winnings are taxed (Bansal & Nah, 2022; Whelan, 2023), as player demand for unregulated off-shore gambling sites is strongly influenced by perceptions of price, privacy, and payout rates (Gainsbury et al., 2018). As a result, some players may prefer playing poker on unregulated sites, even when comparable regulated options are available.

2.3. Hypotheses

Overall, regulation's effect on players' willingness to pay (WTP) for online poker depends on its relative impact on site security and player risk perceptions, deposit and withdrawal processes and its effect on privacy and the taxation of online poker. While improved site security, risk profiles and improved money processing features increase demand, increases in effective tax rates and reduced payoffs reduce demand. Our empirical strategy provides insight into the relative importance of these factors by estimating the effect of regulation and subjective player perceptions on WTP for online poker. Formally, we test the following hypotheses:

Hypothesis 1. Government regulation increases users' willingness to pay for online poker.

Hypothesis 2. Users who subjectively view regulated sites as having better security are willing to pay more for regulated online poker games.

Hypothesis 3. Users who subjectively view regulated sites as less risky are willing to pay more for regulated online poker games.

Hypothesis 4. Users who perceive that the deposit/withdrawal process is easier on regulated sites are willing to pay more for regulated online poker games.

Hypothesis 5. Users who perceive that regulation increases the likelihood poker winnings are taxed are willing to pay less for regulated online poker games.

3. Study 1: Focus groups

We conducted three studies: two small qualitative studies intended to support the development of the experiment (McIntyre & Srinivasan, 2017) and the DCE itself. Study 1 was a focus group used to investigate

whether the draft instrument effectively communicated all relevant topics and included all essential features for respondents to correctly evaluate the trade-offs players make when choosing an online poker site. Study 2 was individual interviews used to evaluate the survey instrument's readability and design. Study 3 was the DCE, administered to a diverse group of uncompensated online poker players using a web-based survey. The second author's Institutional Review Board approved the studies.

3.1. Study 1: Methods

The first study was a focus group with experienced online poker players. Each member of our focus groups was at least 21 years old and had experience in playing online poker for money. We recruited these individuals from candidates who responded to flyers posted around a large public university campus, with selections made on a first-come, first-served basis, provided they had active online poker accounts. Each participant was given a \$50 cash incentive. All of the members had experience playing cash games. Three members primarily played micro stake games (big blind as high as \$0.50), two members participated in small-stake games (up to a \$2.00 big blind), and one member played in games we defined as middle stakes (up to a \$10 big blind). The focus group was moderated by a trained graduate student, with the second author acting as an observer and contributing to the discussion. An audio recording of the focus group was transcribed using Whisper (Radford et al., 2022) and then cross-checked against the audio.

The group consisted of six participants who completed a physical copy of a draft DCE survey. After the instrument was completed, we engaged in a group discussion, systematically reviewing each question and related topics. This provided an opportunity for respondents to provide opinions, ask questions, and share their likes and dislikes.

The initial focus group had several key objectives, including: (1) exploring the themes of the survey, (2) ensuring participants were evaluating alternatives when selecting between site options, (3) confirming participants could maintain consistency with characteristics not included in the survey, (4) determining if all relevant characteristics had been incorporated, and (5) verifying that the selected attribute levels were realistic.

3.2. Study 1: Results

The initial discussion indicated that respondents were making trade-offs as intended, the characteristics included were important, and the levels we used were appropriate. The participants agreed that they could understand the trade-offs in the choice sets. They also confirmed that they did not consider other attributes when making decisions, either keeping other characteristics constant: "I just assumed they were all constant as far as quality and graphics and everything" or imagining a similar platform: "I just pictured the exact same website."

In general, participants offered different views on the relative importance of government regulation to their choice of poker sites. For instance, one participant noted that it would be the primary variable they considered.

"I kind of think it'll feel safer if it's regulated. So, if it was yes in regulation, then I'd probably defer to that ... [government regulation] would probably make my determination, just because I feel like I could know when it would be safe and it was going through a secure venue, and it wasn't just some random website that might steal my stuff."

A different participant commented that government regulation would be a negative characteristic, due to concerns about taxes and a perceived lack of benefits from government regulation.

"For me, government regulation is a real bad thing, because the market regulates it. A poker site has to be honest, otherwise they're

just going to lose their player base. Once the government gets involved, then I've got major problems, because then I've got to be looking at my big blind, plus what I'm going to be paying in taxes. Now, if I'm able to, which I did, I paid tax on my winnings, the thing is I'm able to do that at the end and write off a certain amount, where if the government sees exactly what I won, are they going to look at my losses the same way? That's what I'm more concerned about with government regulation, is – are they going to be viewing profit? Or are they going to be viewing revenue versus losses and getting it all mixed up? And then that becomes an issue.”

The same participant noted that he viewed a large number of players on a site as a sign that the site is trustworthy, and would not steal his money: *“If they have a huge player base, [the players] are not getting ripped off ... If they have eight players, obviously, it's a little sketchy. So that's what I use. And that's why government regulation isn't exactly important to me. ... The number of players would signify that its more reliable to me on a general scale.”*

A third participant suggested that regulation would be a positive tie-breaker between comparable sites: *“For me, the government regulation would matter if everything else was fairly similar. So if the rest of it was the same, and then one was regulated, and one wasn't, I'd go with the regulated one. But if they were drastically different, it would mean nothing to me, personally.”*

Multiple participants mentioned conflating government-related security from regulation and private-security measures: *“I thought regulation would mean secure third party”* and *“But that doesn't mean there isn't [site security] if it's not government regulated. Because I know websites that are [not regulated] that do.”*

Some of the benefits from government regulation appear to be related to fear from government enforcement against unregulated sites: *“I prefer it, because what happened before [Black Friday], when it all of a sudden became illegal and the website I was playing on just lost my money. So for me, it's more of a guarantee that it's not just going to randomly shut down.”* A different participant noted that unregulated sites generally operated well prior to Black Friday: *“For me, it's not too much of a worry. There was a one-time instance with Black Friday. And for everything else, if you've been playing, you get paid out, you get your checks, and there was a one-time, [Black] Friday, and it's not really a big deal for me.”*

3.3. Study 1: Discussion

A primary limitation of a DCE is the requirement that responses to hypothetical scenarios reflect observed behavior and that data based on stated choices bias results when choice sets do not fully reflect reality (Quaife et al., 2018). One of the focus group's main results is that the focus-group members believed that they had the capacity to evaluate the trade-offs presented in the DCE and that their responses reflected actual preferences and likely behavior. Online poker games and DCEs both require that participants make decisions under uncertainty based on hypothetical trade-offs, this qualitative analysis suggests that online poker players are ideal candidates to participate in studies based on DCEs.

Based on the feedback from the first focus group, we made two adjustments to the survey. First, we clarified the definition of “Number of Players” on the site to prevent confusion between static versus dynamic player counts. Second, we added “Site Security” as a characteristic in the experiment to control for non-government security measures that may confuse respondents if not included.

4. Study 2: Interviews

4.1. Study 2: Methods

We recruited three individuals from the university campus with experienced in online poker. These participants completed a revised

version of the DCE survey, which was administered online via Qualtrics while the interviewer was present in-person. Each participant was given a \$50 cash incentive. The interviews were led by a trained graduate student, with the second author acting as an observer and contributing to the discussion. An audio recording of the focus group was transcribed using Whisper (Radford et al., 2022) and then cross-checked against the audio.

The primary objectives of the second focus group were to: (1) evaluate the online survey's aesthetics and usability, and (2) evaluate whether changes to the survey were being interpreted as intended.

4.2. Study 2: Results

Interviewees generally had no issues with the instrument, including the additions made after the focus group. Each of the interviewees identified the new site security variable as an important consideration in the choice set.

“You have that conscious feeling that just kind of goes through and you're like, alright, [site security is] above average, so it kind of calms you down ... The last thing [considered] was the number of players ... Really it was the security, the government regulation, and the fee.”

“For me, I'm concerned about the site security, whether I'm going to get my money back.”

“I think people also do look at security. For me it is important because I don't want to go into the website where I don't feel secure because it has all my bank account information and everything.”

One of the interviewees with experience playing on a regulated site mentioned negative geolocation issues that emerged as a result of state regulatory requirements: *“They do check my location every time I log on. it gets funky sometimes when I try to log myself in with my phone application because they think I'm somewhere else.”* The same respondent provided feedback about the differences between online and live poker, which led to the addition of a question asking the distance to the nearest land-based casino or card room at the respondent could play poker for money: *“If I don't play [online], then I just go to live [poker]. So I don't have to shop around that much.”*

4.3. Study 2: Discussion

The findings from the one-on-one interviews generally validated the findings from the focus group. Based on the general feedback from the interviews, we removed nonessential questions, thereby shortening the survey, and we refined the levels of the site security feature to exclude below average levels in the choice set. The final choice set is provided in Appendix A.

5. Study 3: Discrete choice experiment

5.1. Study 3: Participants

The DCE was administered through an online survey over seven days. Respondents were recruited through links on several poker-related websites and social media posts by the authors, professional poker players, and poker media sites. Participants were individuals who had played online poker for real money and were at least 21 years old. Respondents received no compensation. A total of 1491 participants began the survey, out of which 937 commenced the experiment. Among them, 884 completed all seven experimental questions, and 101 consistently chose the option that involved government regulation. In the experiment, we excluded participants who consistently selected the same options. Their data does not reveal insights into the decision-making process regarding the selection of sites, as it lacks evidence of comparative evaluation.

5.2. Study3: Design

DCEs address endogeneity problems that bias the estimated effects of regulation and private security on online poker demand because they rely on the randomization of product features to identify the effects of product features on the demand for online poker (Hartmann et al., 2008). The experiment presents respondents with pairs of hypothetical internet poker sites that differ and the experimental design randomizes the features included in the hypothetical poker sites presented. Respondents face a forced-choice design and choose one of the two hypothetical poker sites in each choice experiment (Allenby et al., 2014). An illustration of a hypothetical choice is presented in Fig. 1.

The experiment was administered online using Qualtrics. The level of the features in the experiment differed depending on the respondent's preferred stake level. The stake level is defined by the size of a game's big blind, which is a mandatory bet paid by players, and determines the level of money placed at risk. Players indicated whether they played for micro (up to \$0.50 big blind), small (\$0.51 to \$2.00 big blind), middle (\$2.01 to \$10.00 big blind), or high stakes (above \$10.00 big blind).

Each stake level contained nine blocks with eight choice sets. A fractional design was used to ensure that the questions in the experiment are balanced and orthogonal (Aizaki, 2012). The choice set included five different poker-site features. Respondents were randomly assigned to blocks of DCEs, based on reported preferred stakes. The initial choice set included a discussion of the choices available and is considered practice. Respondents were told, "(w)hile this is a hypothetical choice and not a real one, we ask you to consider your preferences and make choices just as if you were choosing a website to play No-Limit Texas Hold'em,"

before the experiment. Respondents were told to hold site features not included in the survey constant while making their choices. The survey included a link to a document that defined the features included in the study.

A *Regulated* site was defined as a site where state legislation allows online poker sites to enter the market after receiving approval from a State Gaming Commission. Respondents were told that government regulation allows online sites to legally accept many forms of payment, including credit cards and it allows the state to tax online poker. Respondents were told that Nevada, Delaware, and New Jersey offered government-regulated online poker sites in the U.S.

Average security was defined as sites that regularly pass security audits and adopt policies that guarantee that player balances are not used for operational expenses. *Above-average security* was defined as sites that regularly pass security audits, adopt policies that guarantee that player balances are not used for operational expenses, use secure third-party options for deposits and withdrawals, and employ additional security measures such as security keys.

The experimental design included six different levels for the network-size feature. To ensure that the choice set for network size was reasonable, we directly observed network sizes on the first regulated U. S. state network in Nevada in the year after its launch (2014) and the largest open global network as tracked by industry monitor, [PokerScout.com](#) (2019). The experiment included a feature that measured the average skill level of players on a poker platform to estimate the effects of player composition on a poker platform's demand, "Voluntary Put Money in Pot" (VIP) (Johansson & Sönström, 2009; Siler, 2010; Teofilov et al., 2014). Last, the survey included the variable *Cost*, where *Cost*

Question 5 of 8

Disregard your previous choices. Compare the five features for A and B and pick the option you would prefer.

	Option A	Option B
Government Regulation	Yes	No
Site Security	Above Average	Average
Cost	\$8.25 per hour, per table	\$11.50 per hour, per table
Small-Stakes Players on Site	2,500 Small-Stakes Players	4,000 Small-Stakes Players
Average VPIP-Small Stakes	19%	28%

*Definitions of characteristics can be seen by clicking [here](#), and will appear in separate browser tab.

*Cost is for a game where the big blind equals \$2.

Which Option do you prefer?

Option A
☐

Option B
☐

Fig. 1. Sample discrete choice decision faced by a respondent in the survey instrument.

equals the time-based rake per hour of play at a table. Cost levels are based on information contained at rakeatpoker.com and differed according to the respondent's preferred stake.

5.3. Study 3: Descriptive statistics

Our sample consisted of 783 poker players. The sample was somewhat skewed towards higher-stake players. The sample included: 31.2% micro-stake, 42.0% small-stake, 23.6% middle-stake and 3.2% high-stake players. By contrast, [Fiedler and Philander \(2013\)](#) estimated that 46.6% of U.S. players played in micro-stake games, 42.6% played for small stakes, 10.3% played for middle stakes, and 0.5% were high-stake players. We removed the high-stake respondents from the sample because of their low numbers ($n = 25$). The final data set included 758 respondents that completed 5306 DCE choices.

Eleven percent of the sample reported that they were professional poker players. About 33% of respondents stated that they played online poker to make money, 26% for the entertainment value, and 40% stated that entertainment is important and they expect to supplement their incomes with poker earnings. The average respondent spent over 18 h per week playing poker ($SD = 26.2$). Eighty percent of the sample had five or more years of playing experience while only three percent had fewer than twelve months of experience. Most respondents stated they 'Sometimes' (24%), 'Often' (24%) or 'Always' (36%) play on more than one table of online poker at a time. Roughly five percent of our respondents resided in Canada (5.1%), and 13.5% resided in states that offered regulated online poker. The mean respondent was 38.30 years old ($SD = 12.20$) and most respondents reported that they were male (93.45%).

After respondents completed the DCE, the survey included a series of questions that asked participants whether they "Agree or Disagree with the following statements about Government Regulation and online poker?" on a five-point Likert scale from strongly disagree (1) to strongly agree (5): 'Site security is likely better on regulated sites' ($M = 3.87$, $SD = 1.09$); 'there is less risk associated with playing on regulated sites' ($M = 4.11$, $SD = 1.02$); 'the withdrawal/deposit process is easier on regulated sites' ($M = 4.04$, $SD = 1.12$); and 'I am less likely to play on regulated sites because the government will tax my winnings' ($M = 2.22$, $SD = 1.09$). Response frequencies to these questions are illustrated in

Fig. 2.

5.4. Study 3: Empirical framework

Our empirical model assumed that consumers choose the poker platform that maximizes their indirect utility. The empirical analysis uses the framework of McFadden's ([McFadden, 1974](#)) random utility model to estimate the effects of game features on the players' utility for online poker games. Player utility is increasing in poker earnings and the enjoyment consumers receive from playing poker and depends on regulation and other platform features.

We used data from the DCE to estimate the amount players were willing to pay for different poker-site features. Survey respondents were presented with pairs of hypothetical Internet poker sites that differed in poker-site features and were asked to choose the option they preferred, holding all other poker-site features constant. The indirect utility a poker player receives from playing on a particular site includes a deterministic component based on observable site characteristics, and an unobserved random component. Respondents are assumed to maximize a random utility function of the general form:

$$U_{ij}^k = \mathbf{X}_{ij}^k \beta + \varepsilon_{ij}^k, \quad (1)$$

$$i = 1, \dots, n; j = 1, \dots, J; k = A, B,$$

Where U_{ij}^k equals the utility player i receives from option k on occasion j . The term $\mathbf{X}_{ij}^k$ equals a vector of features associated with option k , and ε_{ij}^k is the random disturbance term. Player i chooses option A over option B when $U_{ij}^A > U_{ij}^B$ or when $(\mathbf{X}_{ij}^A - \mathbf{X}_{ij}^B)' \beta > \varepsilon_{ij}^B - \varepsilon_{ij}^A$. The distribution of the error term, ε_{ij}^k , is assumed to be given by a standard Type I extreme value distribution and that the errors are uncorrelated with the vector of characteristics. Given these conditions the probability that player i chooses option A $P_{ij}^A = P(U_{ij}^A > U_{ij}^B)$, equals:

$$\frac{e^{\mathbf{X}_{ij}^A \beta}}{e^{\mathbf{X}_{ij}^A \beta} + e^{\mathbf{X}_{ij}^B \beta}}. \quad (2)$$

Maximizing the log likelihood function derived from equation (2) produces an estimate of a representative player's indirect utility

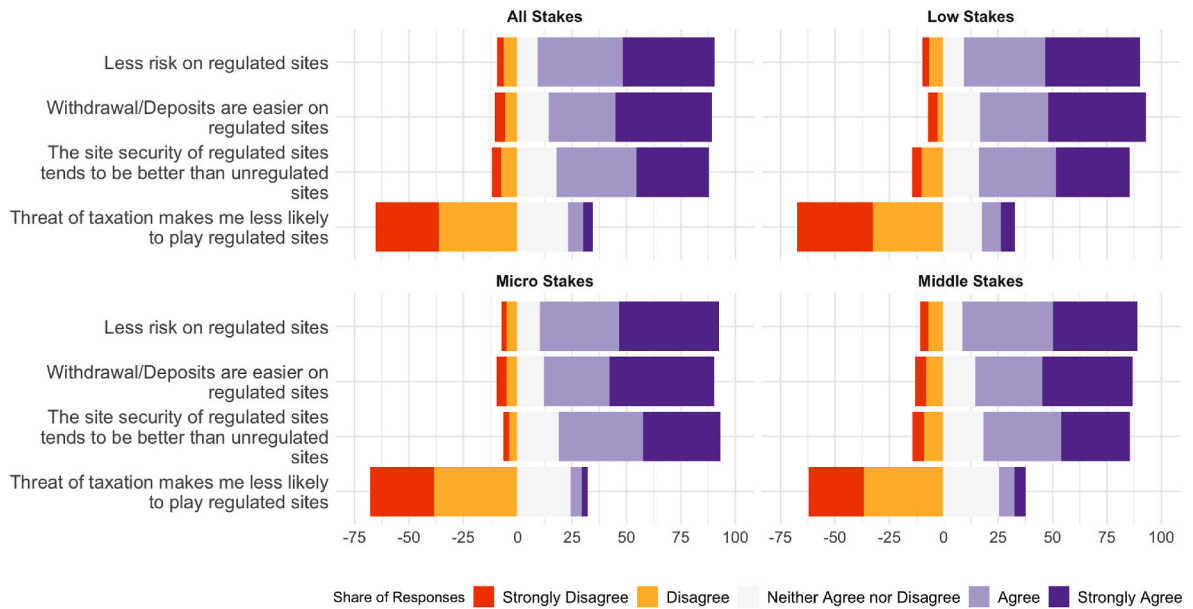


Fig. 2. Frequencies of responses to attitudes about regulation questions, by stake.

Notes: Respondents across stakes generally agree that there is less risk on regulated sites, better security, easier deposits/withdrawals, and that a threat of taxes is not a barrier to play.

function. Estimates of players' willingness to pay are derived for site characteristics by scaling each given characteristic's coefficient by the cost coefficient. The empirical model uses the following linear approximation of a representative player's indirect utility function, where subscripts are suppressed for clarity of presentation:

$$U = \beta_1 \text{Regulation} + \beta_2 \text{Security} + \beta_3 \text{Cost} + \beta_4 \text{Players} + \beta_5 \text{VPIP} + \varepsilon \quad (3)$$

The amount a player is willing to pay to play on a site with *Regulation* equals the amount by which a site with *Regulation*'s *Cost* would have to differ from the *Cost* of playing on a site with no *Regulation* to make the respondent indifferent between the regulated and unregulated sites:

$$\beta_1 (\text{Regulation} = 1) + \beta_2 \text{Security} + \beta_3 (\text{Cost} + \text{WTP}) + \beta_4 \text{Players} + \beta_5 \text{VPIP} = \beta_1 (\text{Regulation} = 0) + \beta_2 \text{Security} + \beta_3 \text{Cost} + \beta_4 \text{Players} + \beta_5 \text{VPIP} \quad (4)$$

The amount a representative player is willing to pay to play on a site with *Regulation* is calculated by solving for WTP:

$$\text{WTP} = -\frac{\beta_1}{\beta_3}$$

The empirical approach uses controlled comparisons to find the point where the extra *Cost* per-hour has the same effect as being unregulated as opposed to regulated. This point is found where the two sites with different attributes end up with the same rating, as represented by the player's indirect utility, where the representative player is equally likely to choose one site or the other.

5.5. Study 3: Results

Table 1 contains WTP estimates based on the results of the conditional logit model for players located in the U.S. Full results of the conditional-logit model are provided in Appendix B. The estimates suggest utility is increasing in government *Regulation* and above average *Security*. We also find that the WTP for government *Regulation* is increasing in the game's stake but is decreasing in stake when normalized by the size of the game's big-blind bet. The normalized WTP estimates for government regulation, respectively, equal 1.76, 1.005 and 0.535 big blinds per hour. Assuming an average player plays 100 hands per hour, this is roughly equal to 33%–56% of gross revenue when compared to Siler's (2010) rake estimates of 4.98 big blinds per 100 hands at micro stakes, 3.00 at small stakes, and 0.95 at middle stakes.

Fig. 3 contains estimates that test whether the WTP for government regulation vary according to differences in player attitudes about government regulation. The results were generally consistent with H2–H5 for micro-stake and small-stake players. For example, micro-stake players who agreed that regulation improves site security were willing to pay a \$0.93 premium for government regulation over individuals who did not agree. Using weights from Fiedler and Philander (2013) of the actual market size, the average weighted WTP for regulation is \$1.83 across all three groups.

Chi-squared tests rejected the null hypothesis that micro-stake players' WTP for regulation do not vary based on attitudes towards

Table 1

Willingness to pay estimates for government regulation and above average security.

	Micro Stakes	Small Stakes	Middle Stakes
Government Regulation	0.88*** (0.12)	2.01*** (0.33)	5.35*** (0.74)
Above Average Security	0.83*** (0.13)	2.93*** (0.37)	5.05*** (0.77)

*p < 0.1, **p < 0.05, ***p < 0.01.

Notes: Robust standard errors, clustered by respondent, in parentheses calculated using the delta method. ***p < 0.01, **p < 0.05, *p < 0.1. Full results are provided in Appendix B.

site security, $\chi^2(1) = 11.34$, $p = 0.001$; risk, $\chi^2(1) = 3.35$, $p = 0.068$; deposits and withdrawals, $\chi^2(1) = 4.25$, $p = 0.039$; and taxation, $\chi^2(1) = 10.18$, $p = 0.001$. Similar results were found for small-stake players: Site security, $\chi^2(1) = 9.47$, $p = 0.002$; risk, $\chi^2(1) = 8.46$, $p = 0.004$; deposits and withdrawals, $\chi^2(1) = 5.89$, $p = 0.015$; and taxation $\chi^2(1) = 4.35$, $p = 0.037$. Middle-stake players were willing to pay the most for regulation but attitudes about the effect of regulation generally had little impact on their WTP for regulation: site security, $\chi^2(1) = 0.17$, $p = 0.680$; risk, $\chi^2(1) = 2.83$, $p = 0.093$; deposits and withdrawals, $\chi^2(1) = 0.07$, $p > \chi^2 = 0.791$; and taxation, $\chi^2(1) = 0.05$, $p = 0.823$. Full results are presented in Appendices C and D.

5.6. Study 3: Exploratory analysis

Respondent attitudes about regulation may be affected by the regulatory regime in their home markets. To better understand the role of the regulatory environment on consumer attitudes, we used data from the survey to explore whether there were differences in attitudes towards regulation between players in either regulated states or in Canada, where the government conducts and manages gambling. We categorized Likert scores on a scale from one to five and used t-tests to examine whether there were differences in mean attitude scores between U.S. and Canadian respondents, and between US respondents from states with and without regulated online poker.

We found that respondents from Canada were less likely to agree that 'site security is likely better on [regulated/government-operated] sites' ($M = 3.12$, $SD = 1.12$), $t(700) = 4.18$; $p < 0.001$; 'there is less risk associated with playing on [regulated/government-operated] sites' ($M = 3.27$, $SD = 1.07$), $t(710) = 4.90$; $p < 0.001$; and 'the withdrawal/deposit process is easier on [regulated/government-operated] sites' ($M = 3.28$, $SD = 1.28$), $t(678) = 3.82$, $p < 0.001$. They were more likely to agree 'I am less likely to play on [regulated/government-operated] sites because the government will tax my winnings' ($M = 2.71$, $SD = 1.19$), $t(712) = -2.72$; $p = 0.003$.

Similarly, we found that respondents from regulated states were less likely to agree that 'site security is likely better on regulated sites' (Regulated: $M = 3.46$, $SD = 1.05$; Unregulated: $M = 3.98$, $SD = 1.06$), $t(666) = 4.37$; $p < 0.001$; and 'the withdrawal/deposit process is easier on regulated sites' (Regulated: $M = 3.71$, $SD = 1.17$; Unregulated: $M = 4.13$, $SD = 1.08$), $t(649) = 3.37$, $p < 0.001$. We observed no statistically significant difference in responses to 'there is less risk associated with playing on regulated sites' (Regulated: $M = 2.33$, $SD = 1.15$; Unregulated: $M = 2.17$, $SD = 1.05$), $t(677) = 1.05$; $p = 0.147$; and 'I am less likely to play on regulated sites because the government will tax my winnings' (Regulated: $M = 3.12$, $SD = 1.12$; Unregulated: $M = 3.12$, $SD = 1.12$), $t(678) = -1.41$; $p < 0.920$.

5.7. Study 3: Discussion

Our results suggest that online poker players were willing to pay a premium to play on sites regulated by state gaming commissions, and that this premium increased for low-stake players who view regulated sites as less risky. The average micro-stake player was willing to pay a \$0.88 per-hour premium to play on regulated sites and this rate increases to \$5.35 for middle-stake players. This finding is consistent with the notion that regulated sites can provide services, assurances, and/or peace of mind that is not provided by unregulated sites. The finding that respondents were also willing to pay a premium for sites that employ services defined as *Advanced Security*, holding *Regulation* constant, provides evidence that private certification alleviates problems associated with asymmetric information and generates value in this market.

Our results further supported the notion that financial restrictions on deposits and withdrawals significantly increase the demand for regulated sites. Micro-stake and small-stake players who agree that regulation makes it easier to deposit and withdraw funds were willing to pay \$0.57 and \$1.83 more, respectively, for government regulation than

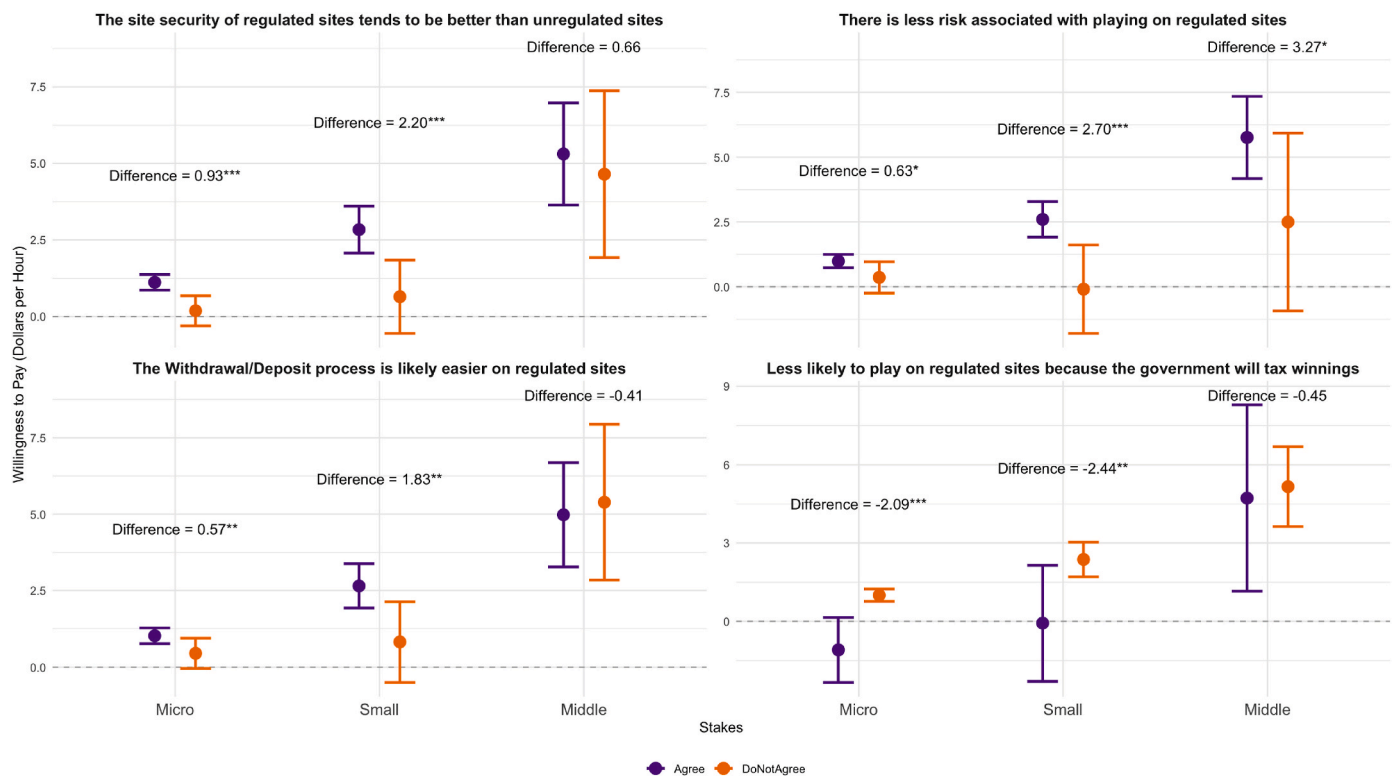


Fig. 3. The effects of attitudes and perceptions on the willingness to pay for government regulation among U.S. respondents.

Notes: Agree includes participants who responded 'Agree' or 'Strongly Agree'; Disagree includes participants who did not 'Agree' or 'Strongly Agree'; 95% confidence intervals using robust standard errors, clustered by respondent. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

players who do not agree. The estimated WTP for regulation becomes negative for players who agree that regulation increases the likelihood that winnings are taxed. Overall, these findings provide support for the notion the amount players are willing to pay for government regulation is heterogeneous and that differences in attitudes about regulation's effect on site security, risk, tax liability, and payment convenience affect micro- and small-stake players' WTP for regulation.

Across all our results, we find that the moderation effects from consumer attitudes towards regulation tend to disappear at the middle-stake level. Players at this level are willing to pay a premium for government regulation, regardless of their subjective views about risk and site security on regulated sites, withdrawal/deposit convenience, or taxation. It may be the case that there are other benefits viewed by this group from regulation that make it desirable, such as legitimization of their profession or hobby or broader growth in popularity of the game.

Finally, results from our exploratory analysis provided some indication that part of attitudes towards regulation will be environmental. Canadian residents who have had wider access to regulated and unregulated markets, generally had the least favorable attitudes towards the benefits of regulation. Individuals in U.S. states with regulated online poker also viewed regulation less favorably, albeit not to the same levels as the Canadian respondents.

6. Conclusion

Online businesses face multiple challenges in establishing consumer trust. In addition to satisfying perceptions of confidence in the operator's reliability and integrity, they must also satisfy consumer skepticism over the conduct of other users (Chen et al., 2009). This absence of trust by parties can lead to market failures when asymmetries in information between different sides of the market result in a failure to transact (Akerlof, 1970). In few markets is the potential lack of trust more salient than in online poker, where consumers may have distorted views about

the product (Fortune & Goodie, 2012) and there is also a public history of defrauded consumers (McMullan, 2012).

Trust in online poker is a multifaceted construct, shaped not only by assurances like secure deposits or verified randomness, but also by more abstract dimensions of perceived legitimacy. Trust may emerge from a consistent alignment between player expectations and experienced reality (Schoorman and Mayer, 2007). This alignment transcends any single protective measure and necessarily relies on a set of interdependent safeguards, some visible and explicit, and others implicit and cultural. For example, on a site with convenient payment processing but low perceived trust, users may elect to reduce their own risk by only depositing funds to their accounts when needed to play, and otherwise not keep any deposits with operators.

In a regulated market, transparent licensing arrangements, clear dispute resolution protocols, and demonstrable oversight from third-party auditors lend weight to the idea that the game operates within a structured framework. Trust is not just about ensuring that funds are safe or that player data are secure but includes players believing they are participating in a well-ordered system where fairness is the expected norm. Indirect signals also contribute to user interpretations of a site's commitment to fair play, including factors like responsiveness of customer support, timeliness of problem resolution, and the perceived earnestness of communication.

This study finds that government regulation can provide benefits beyond those created by private site-security features. The results from our DCE demonstrated that online poker players in the U.S. are willing to pay a premium for both *Government Regulation* and *Above-Average Security*. Attitudes towards the benefits of regulation also impact WTP at lower stake levels, with micro- and small-stake players both willing to pay a premium for government regulation if they hold attitudes that view regulation favorably in terms of its implications for site security, site risk, deposits and withdrawal convenience, and tax liability. At middle-stakes, no attitude premium was robustly observed.

Our findings provide evidence that the Unlawful Internet Gambling Enforcement Act, which impaired the ability of players to deposit and withdraw funds easily from unregulated sites, continues to affect the demand for regulated online poker. We estimated that micro- and small-stake players who agree that the withdrawal/deposit process is easier on regulated sites were, respectively, willing to pay \$0.57 and \$1.83 more to play on regulated sites compared to players who did not agree. Results from our exploratory analysis further suggested that environmental factors may influence the WTP. Respondents from Canada, who were likely to be minimally impacted by Black Friday and other U.S. interventions, showed less favorable attitudes towards the benefits of regulation than Americans. Put together, it may be the case that part of the value created by government regulation is an assurance that there will not be future government intervention that harms the market and that the inability to promptly return player funds contributed to long-lasting mistrust among American users. That conclusion is also consistent with discussion from our focus group.

A perception that poker winnings are more likely to be taxed on government-regulated sites reduced the demand for regulated poker sites. Among individuals who agree that taxation is more likely on regulated sites, the difference in WTP on a regulated site was \$2.09 and \$2.44 lower in micro and small stakes, respectively. These findings reinforce the notion that regulators should be aware of the effects that their actions may have on consumer efforts to bypass regulated markets. Decisions regarding licensure, taxes, market structure, and restrictions imposed on unregulated providers may determine how completely a regulated market displaces illicit markets (Caulkins & Kilborn, 2019).

Future studies should explore this relationship more deeply and in different industrial settings to determine the extent to which consumers view private strategies as a substitute for state regulation. For example, many consumers continued to consume illegal cannabis after it was legalized in Canada, citing high prices and inconvenient access in the regulated market. Likewise, many of the information asymmetry issues faced by users of online poker sites also affected users of cryptocurrency exchanges (Arner et al., 2023). It remains an open question whether users view the monitoring of activities by regulators and private certifiers as substitutes but will only pay a premium for the protections governments can provide, such as legally enforcing criminal penalties for fraudulent actions. In our study, regulation and security were valued at micro stakes levels where the value of funds at risk is nominal. Accordingly, it may be worth exploring if part of the value created is related to game integrity rather than financial risks. This would increase the aperture of relevant markets where some government supervision could add value.

Future work should also consider contributions that address the methodological limitations of our work. Although the findings in our qualitative studies suggest that poker players carefully consider product traits in their DCE and decisions to play, stated preferences can meaningfully differ from revealed preferences, and the respondents' decisions were bound by the available choices provided to them. Future work

could seek natural experiments to validate aspects of these findings. Study participants were also recruited through a non-probability sampling technique and our empirical results are more likely to be directionally/ordinally valid, rather than unbiased population-wide estimates. For instance, some respondents had a strict preference for regulated sites across all choice sets, which required that they be removed from the estimation set since there were no trade-offs. This likely leads to underestimation of the value of regulation. Future work could also investigate how changes in DCE attributes, such as the game variant or rake structure, and population surveyed affect this study's findings. For example, future work could compare respondents' attitudes toward regulation with results from different countries, demographics, or psychographic traits.

Finally, our results support the notion that regulations create value in the market for online poker, but they do not necessarily imply that regulations are positive. Regulation often leads to increases in price (Chambers et al., 2019), therefore benefits to consumers (psychic or actual) must be weighed against the costs that they create.

CRediT authorship contribution statement

Kahlil S. Philander: Writing – review & editing, Writing – original draft, Visualization, Methodology, Investigation, Formal analysis, Conceptualization. **Bradley S. Wimmer:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Author note

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Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: In the three-year period from 2020 to 2023, Kahlil Philander received research funding from the Washington State Gaming Commission, the Cambridge Health Alliance, Division on Addiction, and the Board of Regents of the Nevada System of Higher Education; he received consulting payments from British Columbia Lottery Corporation, Eilers & Krejčík Gaming, Seminole Hard Rock Entertainment Inc., Responsible Gambling Council of Canada, and Victor-Strategies; and he received expert witness payments from Crown Resorts Ltd, Jones Ward PLC, and Scientific Games Corp. More information about his activity is available on his personal website at kahlil.co.

Appendix A. Choice Set

Choice Set of the discrete choice experiment.

Feature	Explanation	Micro Stakes	Small Stakes	Middle Stakes
<i>Government Regulation</i>	The poker website is regulated by the government entity in the geographical area where the respondent lives.	Yes No	Yes No	Yes No
<i>Site Security</i>	The quality of the website's security features compared to the overall industry standard.	Average Above Average	Average Above Average	Average Above Average
<i>Cost</i>	Time-Based Rake is based on a short-handed table of No-Limit Texas Hold'em with 6 players playing for Stake Level	\$1.50 per hour, per table \$2.50 per hour, per	\$5.00 per hour, per table \$8.25 per hour, per	\$9.00 per hour, per table \$15.00 per hour,

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Feature	Explanation	Micro Stakes	Small Stakes	Middle Stakes
<i>Players on Site (Network Size)</i>	Number of players on a site playing No-Limit Texas Hold'em for Stake Level	table	table	per table
		\$3.50 per hour, per table	\$11.50 per hour, per table	\$21.00 per hour, per table
		\$4.50 per hour, per table	\$14.75 per hour, per table	\$27.00 per hour, per table
		50 players	50 players	25 players
		150 players	150 players	75 players
		500 players	500 players	225 players
		675 players	1250 players	500 players
<i>Average VPIP</i>	Voluntarily Put Money in the Pot: The website's average VPIP for Texas Hold'em at tables with 6 players.	1250 players	2500 players	1000 players
		4000 players	4000 players	2000 players
		19%	19%	19%
		28%	28%	28%
		37%	37%	37%

Appendix B. Conditional Logit Model Results

These are the results of the conditional logit model for players located in the U.S.

Variables	Micro Stake	Small Stake	Middle Stake
Regulation	0.557*** (0.077)	0.394*** (0.067)	0.600*** (0.088)
Site Security	0.525*** (0.078)	0.574*** (0.068)	0.566*** (0.089)
Cost	−0.629*** (0.051)	−0.196*** (0.013)	−0.112*** (0.011)
VPIP Tight	−0.426*** (0.097)	−0.635*** (0.082)	−0.683*** (0.117)
VPIP Loose	0.340*** (0.096)	0.212*** (0.079)	0.338*** (0.101)
Network Size 2	0.689*** (0.152)	0.700*** (0.124)	0.764*** (0.175)
Network Size 3	1.038*** (0.192)	1.127*** (0.156)	1.524*** (0.220)
Network Size 4	1.536*** (0.209)	1.591*** (0.185)	1.702*** (0.233)
Network Size 5	1.733*** (0.190)	1.606*** (0.168)	2.137*** (0.239)
Network Size 6	1.907*** (0.172)	1.834*** (0.148)	2.321*** (0.247)
Observations	3206	4326	2534

***p < 0.01, **p < 0.05, *p < 0.1.

Notes: Results are for U.S. respondents; robust standard errors in parentheses.

Appendix C. Effect of Attitudes on Regulation's Effect on Utility

Conditional Logit Estimates of Effect of Attitudes on Regulation's Effect on Utility.

Variables	Micro Stake	Micro Stake	Micro Stake	Micro Stake
Regulation	0.231 (0.202)	0.125 (0.162)	0.291* (0.160)	0.651*** (0.073)
Regulation × Risk	0.403* (0.213)			
Regulation × Security		0.609*** (0.180)		
Regulation × Deposit/Withdrawal			0.369** (0.177)	
Regulation × Tax				−1.366*** (0.412)
Variables	Small Stake	Small Stake	Small Stake	Small Stake
Regulation	−0.019 (0.172)	0.128 (0.121)	0.160 (0.131)	0.466*** (0.068)
Regulation × Risk	0.533*** (0.183)			
Regulation × Security		0.433*** (0.138)		

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Variables	Small Stake	Small Stake	Small Stake	Small Stake
Regulation × Deposit/Withdrawal			0.359** (0.146)	
Regulation × Tax				−0.479** (0.228)
Variables	Middle Stake	Middle Stake	Middle Stake	Middle Stake
Regulation	0.288 (0.206)	0.533*** (0.169)	0.618*** (0.158)	0.593*** (0.098)
Regulation × Risk	0.376* (0.218)			
Regulation × Security		0.076 (0.185)		
Regulation × Deposit/Withdrawal			−0.047 (0.179)	
Regulation × Tax				−0.052 (0.223)

***p < 0.01, **p < 0.05, *p < 0.1.

Notes: Robust standard errors, clustered by respondent, in parentheses calculated using delta method. Estimated coefficients for Above-Average Security, Cost, VPIP, and Players are not reported. Risk equals one when respondent Agrees or Strongly Agrees that there is less Risk associated with playing on Regulated Sites, and zero otherwise. Security equals one when respondent Agrees or Strongly Agrees that the Site Security of Regulated Sites tends to be better than Unregulated Sites, and zero otherwise; Deposit/Withdrawal equals one when respondent Agrees or Strongly Agrees that the Withdrawal/Deposits process is likely easier on Regulated Sites, and zero otherwise. Tax equals one when respondent Agrees or Strongly Agrees that they are less likely to play on Regulated Sites because the government will Tax winnings, and zero otherwise. The analysis includes only U.S. respondents.

Appendix D. Effects of Attitudes and Perceptions on Willingness to Pay for Regulation

	There is less Risk associated with playing on Regulated Sites			The Site Security of Regulated Sites tends to be better than Unregulated Sites.		
	Agree	Disagree	Difference	Agree	Disagree	Difference
Micro Stakes	0.99*** (0.13)	0.36 (0.31)	0.63* (0.34)	1.12*** (0.13)	0.19 (0.25)	0.93*** (0.28)
Small Stakes	2.60*** (0.35)	−0.09 (0.87)	2.70*** (0.93)	2.84*** (0.39)	0.65 (0.61)	2.20*** (0.71)
Middle Stakes	5.76*** (0.81)	2.50 (1.75)	3.27* (1.93)	5.31*** (0.85)	4.65*** (1.39)	0.66 (1.62)
	The Withdrawal/Deposits process is likely easier on Regulated Sites			Less likely to play on Regulated Sites because the government will Tax winnings.		
	Agree	Disagree	Difference	Agree	Disagree	Difference
Micro Stakes	1.02*** (0.13)	0.45* (0.25)	0.57** (0.28)	−1.09* (0.63)	1.00*** (0.12)	−2.09*** (0.65)
Small Stakes	2.65*** (0.37)	0.82 (0.67)	1.83** (0.76)	−0.07 (1.13)	2.37*** (0.34)	−2.44** (1.17)
Middle Stakes	4.98*** (0.87)	5.39*** (1.30)	−0.41 (1.55)	4.72*** (1.82)	5.17*** (0.78)	−0.45 (1.94)

***p < 0.01, **p < 0.05, *p < 0.10.

Notes: Robust standard errors, clustered by respondent, in parentheses calculated using delta method. Respondents Agree when they Agree or Strongly Agree with associated statement. Respondents Disagree when they do not Agree or Strongly Agree.

Data availability

Data will be made available on request.

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