NO. 13-564

In the
Supreme Court of the United States

LAWRENCE DICRISTINA,

Petitioner,

v.

UNITED STATES,

Respondent.

On Petition for Writ of Certiorari to the United States Court of Appeals for the Second Circuit

BRIEF FOR *AMICUS CURIAE* ROBERT C. HANNUM, PH.D., IN SUPPORT OF PETITIONER

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December 6, 2013

CORPORATE DISCLOSURE STATEMENT

Amicus curiae Robert C. Hannum is an individual.

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INTEREST OF *AMICUS CURIAE*[1]

Amicus curiae Robert C. Hannum, Ph.D., is a Professor of Risk Analysis & Gaming at the University of Denver. He has written extensively on the role of skill in gaming generally and poker in particular. He has also offered expert testimony in several court cases on the issue of whether poker is a game predominantly of skill or chance. Dr. Hannum strongly believes that when judicial decisions rely on statistical analysis, that analysis must be rooted in sound scientific principles. In Dr. Hannum's view, the District Court's decision in this case was based on such principals, which the Second Circuit wrongly refused to take into account in ruling against the Petitioner.

INTRODUCTION AND SUMMARY OF ARGUMENT

As the District Court in this case recognized, ascertaining whether a game constitutes "gambling" under IGBA requires an assessment of whether skill or chance predominates in determining the game's outcome as played in the normal course. That is not only the traditional approach in the law, but also the approach most consistent with sound scientific inquiry.

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[1] Pursuant to Supreme Court Rule 37.6, *amicus curiae* states that no counsel for any party authored this brief in whole or in part and that no entity or person, aside from *amicus curiae* and his counsel, made any monetary contribution toward the preparation or submission of this brief. Pursuant to Supreme Court Rule 37.3, counsel of record for all parties have consented to this filing in letters on file with the Clerk's office.

Using large datasets and advanced empirical analysis, it is possible to separate out the skill and chance elements of a variety of activities, including poker. Indeed, the popularity of online poker has yielded a massive amount of data that can be used to quantify the roles of skill and chance. Through analyzing a series of poker hands drawn from a larger set of hands, which reflects how the game is actually played, an accurate and unbiased estimate of the skill and chance elements of success in poker can be calculated.

The District Court's view of poker, which the Second Circuit inexplicably deemed irrelevant, was largely based on the expert testimony of Dr. Randall Heeb. Employing the same statistical techniques used in a wide variety of empirical endeavors, Dr. Heeb analyzed millions of poker hands played over a one year period and concluded, without qualification, that poker is predominantly a game of skill. Skilled players have higher win rates, are more successful than less-skilled players with every possible starting hand, and earn more profit than less-skilled players with every possible winning hand. And Dr. Heeb is not alone in recognizing that skill predominates in poker. Scholars approaching the problem from a variety of vantage points—*e.g.*, regression analysis, computer simulation, mathematical modeling, and experimentation—have all reached the same conclusion.

The uniform scientific finding that poker is predominantly a game of skill is unsurprising given the skillset required for successful play. If you play long enough, everyone gets the same number of good

hands and bad hands. The reason why some players come out ahead and others behind in the long run—and the reason professional poker players exist—is skill (or lack thereof), not luck. Skilled players leverage their knowledge of probability and statistics to accurately estimate the value of their cards and the likely value of their opponents' cards. They consistently make positive expected-value decisions and strategic choices that put them in the best position to turn a profit. Unskilled players do none of these things, and it shows.

While the Second Circuit refused to consider the matter, the skill involved in successful poker play sets it apart from the "gambling" games enumerated in the Illegal Gambling Business Act ("IGBA"). The common thread running through IGBA's categories of games is that chance is more important than skill in each one. Not so with poker, at least when played by someone with skill. Unlike house-banked games such as slot machines, roulette, and dice, a skilled poker player can make positive expected-value bets and win over time. And unlike lotteries, a poker player's skill impacts his odds of winning. After purchasing a lottery ticket, the lottery player can only hope to get lucky.

ARGUMENT

I. Whether A Particular Game Constitutes "Gambling" Should Be Determined By Reference To Whether Skill Or Chance Predominates In Determining The Outcome Of The Game As It Is Typically Played.

A. For Many Games—Including Poker—It Is Possible To Assess the Effect of Skill and Chance on Players' Results.

Because of the availability of massive datasets and sophisticated empirical analytic techniques, analysts can separate the roles played by skill and chance in determining the outcomes of many activities. Golf is illustrative. Using a random effects model to analyze the play of 253 active PGA Tour golfers over a three year period, statisticians have concluded that "[o]n average, it took 9.6 strokes of cumulative 'good luck' to win a" golf tournament. Robert A. Connolly & Richard J. Rendleman Jr., *Skill, Luck, and Streaky Play on the PGA Tour*, 103 J. Am. Stats. Ass'n 74, 74 (2008); *see id.* at 84 ("[T]o have won these tournaments, ... not only must one have played better than normal, but one must have also played sufficiently well (or with sufficient luck) to overcome the collective good luck of many other participants in the same event."); *PGA Tour, Inc. v. Martin*, 532 U.S. 661, 687 (2001) (discussing the role chance plays in golf). As such studies make clear, even games widely regarded as contests of skill contain a significant element of chance; and—given sufficient data and statistical know-how—the relative roles played by skill and chance are quantifiable.

Poker is ideally suited for such an analysis. The emergence of online poker has yielded a wealth of data about how players play and how that play affects outcomes. Utilizing the same statistical techniques employed in assessing the role of chance in golf (and scores of other activities), the parts that chance and skill play in determining outcomes in poker can be isolated. Such analysis—and not intuition—should inform courts in determining whether poker—or golf for that matter—constitutes gambling when played for a prize.

B. An Accurate Assessment of the Roles of Skill and Chance Critically Depends on Evaluating the Game as It Is Typically Played.

The availability of large datasets and advanced statistical techniques does not ensure the success of empirical efforts to quantify skill and chance. Empirical analysis is only as good as the models used, and the efficacy of those models is constrained by the assumptions on which they are premised. A model that starts from the wrong premise is just as useless as a model that asks the wrong questions or relies on the wrong data. Accordingly, when assessing the roles played by chance and skill in a given game it is critical to evaluate that game as it is typically played. Considering the game in any other manner is akin to considering a different game altogether—no reliable inference can be drawn from analysis that relies on an unrealistic or distorted set of assumptions.

For poker, that means considering a series of poker hands over time.[2] The average poker session lasts several hours; usually four to five hours, but sessions of eight to ten hours are not uncommon. In a face-to-face game, the average rate of play is 30 hands per hour, and thus a single session consists of hundreds of hands. *See, e.g.*, Pet. App. 80a. And online, the pace of play is often at least double that of in-person play. *See* Christopher Grohman, *Reconsidering Regulation: A Historical View of the*

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[2] The most common variant of poker, and the variant referred to herein, is Texas Hold 'em. A Texas Hold 'em hand proceeds as follows:

> The game begins when two personal cards (called down cards or hole cards) are dealt facedown to each player. A round of betting ensues at this stage. These personal cards then start to be combined with a series of community cards (also called the board) that are dealt faceup and shared between all players at the table. Each player seeks to formulate his best five-card poker hand between his down cards and the community cards. The community cards are revealed sequentially, with a round of betting separating each stage. The first three cards are revealed simultaneously and called the flop .... The fourth community card, called the turn, is revealed next. Finally, the last card, the river, is exposed, and a final round of betting takes place. More often than not, all players but one will have folded by this point. If not, the players' down cards are finally flipped faceup and the best hand at the showdown wins the pot.

Nate Silver, *The Signal and the Noise: Why So Many Predictions Fail—But Some Don't* 299-300 (2012). Hands are ranked as follows: straight flush, four-of-a-kind, full house, flush, straight, three-of-a-kind, two pair, one pair, high card. *See id.*

Legality of Internet Poker and Discussion of the Internet Gambling Ban of 2006, 1 J. Legal Tech. Risk Mgmt. 34, 38-39 (2006).[3]

Moreover, a sufficiently broad swath of data must be evaluated for the results of an inquiry into the roles of skill and chance to be meaningful. One could mistakenly observe the same individual win the lottery more than once and wrongly conclude that the lottery is a game of skill. Or one could watch a chess match between two players of relatively equal skill and determine that chess is a game of chance because of the advantage enjoyed by the player who moves first. The same is true of any effort to quantify the skill and chance elements in golf or poker: data from one putt or one hand (or even a handful of putts and hands) may not tell us much. Inferences about the real world must be drawn from large samples to ensure the accuracy of the conclusions drawn and guard against sampling error, observation bias, and the numerous other potential problems that result from using small samples.

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[3] The rate of play is higher online for two reasons. First, electronic actions are faster than physical ones—a virtual deck of cards does not need to be shuffled, and it is faster to type the size of a bet or raise than it is to count and move physical poker chips. Second, many players online play at more than one poker table at a time—sometimes four or five tables at once. This allows online players to play a much larger number of hands in the same amount of time.

II. The District Court Correctly Concluded That Skill Predominates Over Chance In Poker.

A. The Analysis on Which the District Relied Applied Well-Accepted Statistical Principles To Conclude That Skill Predominates Over Chance.

The District Court's conclusion that "poker is predominately a game of skill"—which the Second Circuit disregarded—was largely based on the analysis of Dr. Randall Heeb. Pet. App. 176a; *see* Pet. App. 170a-177a. That analysis was grounded in sound scientific methodology and in keeping with the principles discussed *supra*. Employing commonly-used statistical techniques, Dr. Heeb analyzed millions of hands of Texas Hold 'em played on the website PokerStars between April 2010 and March 2011, an extremely large dataset that enables highly accurate inferences. Pet. App. 60a. To enhance the robustness of his results, Dr. Heeb conducted two separate analyses. First, he examined whether a player's success generally predicted his success when dealt a specific pair of starting down cards—for example, a King and a Nine in different suits. To do this, Dr. Heeb calculated each player's average success rate on all other possible pairs of starting down cards and grouped the players according to whether their averages fell above or below the sample median. He then compared whether players above the median won more (or lost less) when dealt King-Nine than players below the median. That comparison allowed Dr. Heeb to assess whether more

skilled players perform better than less skilled players when dealt the same cards.

Next, Dr. Heeb created a skill index to test whether skill correlated with a player's win rate. He randomly divided the data on millions of poker hands into halves and used regression analysis on the first half to create an index of skill that pegged 240 statistics about how players played to their win rates. He then applied this index to players in the second half of the data and measured its correlation with a player's actual win rate. By doing so, Dr. Heeb was able to observe whether a player's win rate increased along with his skill, as measured by his index.

Dr. Heeb's analyses, which employed the best practices of informed statisticians and empiricists, yielded several conclusions supporting poker's status as a game predominated by skill. He concluded that "players with higher predicted skill on average have higher win rates" and correspondingly, over time, win more money. Pet. App. 65a. "Skillful players are more successful than less skilled players with every possible starting hand" and "[s]killful players earn more profit than less skilled players with every possible winning hand type." Pet. App. 172a. The upshot of Dr. Heeb's analysis: skilled play beats unskilled play and results in more profit.

The importance of skill manifests itself relatively quickly. Eighty-eight percent of the most skilled players (the top 10%) will be ahead of the least skilled players (the bottom 30%) after just 240 hands and 90% will be ahead after just 300 hands. *See* Pet. App. 77a. That finding is critical. As already noted, the average poker session lasts four to five hours,

oftentimes more, and consists of hundreds of hands. Thus Dr. Heeb's results stand for the proposition that at the end of a normal poker session the most skilled players will be ahead of the least skilled players 80%-90% of the time.

B. The District Court's Conclusion That Skill Predominates Over Chance in Poker Is Consistent With the Scholarly Consensus Regarding the Role of Skill in Poker.

Scholars appear to be in unanimous agreement with the District Court's conclusion that skill predominates in poker. Indeed, the "collective expert opinion is unequivocal: poker is a game of skill, and in the long run, a skilled player will beat an unskilled player." Anthony Cabot & Robert Hannum, *Poker: Public Policy, Law, Mathematics, and the Future of an American Tradition,* 22 T.M. Cooley L. Rev. 443, 466 (2005); *see* Robert Hannum, Matthew Rutherford, & Teresa Dalton, *Economics of Poker: The Effect of Systemic Chance*, 6 J. Gambling Bus. & Econ. 25, 42 (2012) ("clearly the driving force behind the economic outcome of Texas Hold'em is skill rather than chance"); Steven D. Levitt, Thomas J. Miles, & Andrew M. Rosenfield, *Is Texas Hold 'Em A Game of Chance? A Legal and Economic Analysis*, 101 Geo. L.J. 581, 585 (2013) ("skill is the primary factor determining the distribution of player returns"); Steven D. Levitt & Thomas J. Miles, *The Role of Skill Versus Luck in Poker: Evidence from the World Series of Poker* 2 (NBER Working Paper No. 17023, 2011), http://pricetheory.uchicago.edu/levitt/Papers/WSOP2011.pdf (there "is strong evidence in

support of the idea that poker is a game of skill"); Noga Alon, *Poker, Chance and Skill* 1 (2006), http://www.tau.ac.il/~nogaa/PDFS/skill4.pdf ("poker is predominantly a game of skill").

The validity of this conclusion is underscored by the fact that it is has been arrived at by a host of scholars employing a wide variety of empirical approaches. Several researchers have come to the conclusion that poker is predominantly a game of skill by analyzing data from actual hands played in a manner similar to Dr. Heeb. Using a database of more than one billion hands of real online poker involving 1.8 million players, Hannum et al. present a regression-based method for isolating and measuring the systemic chance and skill elements in Texas Hold 'em poker. The authors conclude that, though there is an element of systemic chance in poker, "virtually all of the variation in players' returns on investment (ROI's) from playing online Texas Hold'em can be attributed to something other than systemic chance." Hannum et al., *Economics of Poker*, 6 J. Gambling Bus. & Econ. at 42. They go on to argue that the factor that accounts for most of the variation in player profits is skill. *See id*.

Analyzing data from hands played during the World Series of Poker ("WSOP"), Levitt and Miles have concluded that highly skilled players—those players who, for instance, were top money winners in the 2009 WSOP—achieve "an average return on investment of over 30 percent, compared to a -15 percent for all other players." Levitt & Miles, *The Role of Skill Versus Luck in Poker*, *supra*, at 2, 6-7. In a separate study evaluating "more than 12 million

hands of no-limit Texas Hold 'Em played by 2,775 players," Levitt, Miles, and Rosenfield concluded that "skill is a highly important factor in poker and that it is simply wrong to consider poker a 'game of chance,' if that phrase is meant to indicate anything more than the fact that an element of chance is present in any single round of play." Levitt, Miles, & Rosenfield, *Is Texas Hold 'Em A Game of Chance?*, 101 Geo. L.J. at 584, 636. Indeed, "[e]ven tiny differences in skill manifest themselves in near certain victory if the time horizon is long enough." *Id.* at 634.

Analysis of actual hands played has also been used to assess the importance of chance on a hand-by-hand basis. Hannum et al., in their analysis of one billion hands of online Texas Hold 'em, found that 85.2% of all hands played were resolved without a showdown. The authors argue that since for so many hands the winner does not derive the win based on a show of the cards but rather from the decisions of the other players to fold their hands, skill, in the form of players' betting decisions, is of overriding importance in determining the outcome in poker. They also found that of the 14.8% of hands that went to showdown nearly half were won by a player who did not hold the best hand, the winning player having induced opponents, including the player with the best hand, to fold. The authors further report that only 8% of all hands go to showdown and are won by the player with the best hand at the table; more than half (54.1%) of all showdown hands are won by a player who does not have the best hole cards at the table; more than three-quarters (76.4%) of all players who started a

hand folded before seeing the flop; and only 5.7% of all players who started a hand participated in a showdown. Hannum et al., *Economics of Poker*, 6 J. Gambling Bus. & Econ. at 41-43 ("It can be argued that folding may well be the most important skill in the game. Minimizing losses by appropriately folding is at least as important as the skill of maximizing wins—extracting as much money as possible from opponents—when playing hands that end up winning.").

Of course, a player's decision to fold may be influenced by his perception of the strength of his hand, and so it is true that the skill component is not entirely independent of the chance component. But that only underscores that skill is the dominant element. The deal of the cards never actually dictates a player's decisions—it is the player's perceptions and strategies (as opposed to the cards themselves) that dictate the result.

Scholars have come to the same conclusion about the role of skill in poker using computer simulations, mathematical models, and lab experiments. Based on the results of computer simulations of one million hands, Cabot and Hannum concluded that over the course of a large number of poker hands, players with skill defeat ones without skill, and players with equal skill levels perform similarly to each other. Cabot & Hannum, 22 T.M. Cooley L. Rev. at 480-81. While "luck can play a more important role in the short term when skill levels are similar," "skill is a dominant factor even after only 100 hands." *Id.* at 482. Relying on mathematical modeling, Alon has concluded that "skill is the major component in

deciding the results" of poker over the long haul. Alon, *Poker, Chance and Skill*, *supra*, at 1. Indeed, unskilled players do not stand a chance: across 90 hands, the probability that an unskilled player will do better than a skilled player is approximately .187%. *Id.* at 15. Over 140 hands, that chance drops to a miniscule .016%. *Id.* And performing a lab experiment with students where some participants received basic instruction in poker—such as hand ranking strategy, the value of position, assessing whether to fold, call, or bet at various stages during the hand, and the probability of improving one's hand during the course of play—while others did not, Dedonno and Detterman concluded "unequivocal[ly]" that "poker is a game of skill." Michael A. Dedonno & Douglas K. Detterman, *Poker Is a Skill*, 12 Gaming L. Rev. 31, 36 (2008). Put simply, "participants who were instructed outperformed those who were not instructed." *Id.*

Scholars have also concluded that the skill involved in poker is comparable to—and in some instances greater than—the skill involved in other games and activities. Conducting regression analysis using data from poker "tournaments that are a part of the World Series of Poker" and 48 PGA tour events, Croson et al. concluded that "the skill differences among top poker players are similar to skill differences across top golfers." Rachael Croson, Peter Fishman, & Devin G. Pope, *Poker Superstars: Skills or Luck?* 21 Chance 25, 26-28 (2008). In both poker and golf, "[p]revious finishes in tournaments predict current finishes." *Id.* at 28. Moreover, the observed differences in return on investment between high-skill and low-skill poker players is "highly

statistically significant and far larger in magnitude than those observed" between the most and least talented money managers. Levitt & Miles, *The Role of Skill Versus Luck in Poker*, *supra*, at 7.

The bottom line is "[s]erious and skilled poker players tend to win consistently, while those relying on luck do not." Cabot & Hannum, 22 T.M. Cooley L. Rev. at 466. Were skill not the predominant factor the collection of poker winners would resemble "a random selection from the field of all players." *Id.* It does not.

III. A Strong Working Knowledge Of Probability, Statistics, And Strategy Is Necessary For Successful Poker Play.

The uniform conclusion that skill predominates in poker makes sense. "'Over the long run everybody gets the same proportion of good and bad cards, of winning and losing hands.'" *Id.* Skilled players use their knowledge of probability, statistics, and strategy to minimize their losses on bad hands and maximize their profits on good hands. Unskilled players rely on big hands and lucky draws and, in the end, lose.

A. Calculating Probabilities Plays a Key Role in Winning Poker.

A poker player must have a strong command of probability to win consistently. Indeed, skilled players rely on their knowledge of probability repeatedly during a single hand.

The calculations begin as soon as a player receives his down cards. A skilled player will be able to assess the value of his hand based on its

likelihood. He will, for example, know that he had a 5.9% chance of being dealt any pair and a 0.45% chance of being dealt a pair of Aces. A skilled player will then be able to make a probabilistic determination about how his hand stacks up against the hands of his opponents and how his hand value (and his opponents' hand values) will improve as the community cards are dealt. If a skilled player is holding an Ace and a Ten, he will know that there is a 32% chance that he will have either a pair of Aces or a pair of Tens by the time the last card is dealt. If both his cards are of the same suit, he will know that there is a 6.5% chance that he will make a flush (five cards of the same suit) by the end of the hand.

Moreover, a skilled player deploys his knowledge of probability and statistics to make positive expected-value decisions. Every action in poker—a check, call, bet, raise, or fold—has an expected value. Making positive expected value plays is critical—by doing so, the skilled player ensures that he wins in the long run.

The concept of expected value is easy enough to understand. Imagine a situation where two friends, A and B, bet on the outcome of a series of coin flips; B agrees to pay A $10 for every head and A agrees to pay B $5 for every tail. This wager has a positive expected value for A: A will win 50% of the flips and get paid $10 and lose the other 50% and pay $5, for an expected value per flip of $2.50. Conversely, the wager has a negative expected value for B: B will win 50% of the flips and get paid $5 and lose the other 50% and pay $10, for an expected value per flip

of -$2.50. In other words, this is a good bet for A and a bad bet for B.

Skilled players take the concept of expected value and apply it to substantially more complicated situations in real time where money is on the line. The following example is illustrative. A's down cards are the Ace and Eight of Hearts. Three community cards have already been dealt: the Two of Hearts, Jack of Hearts, and Seven of Spades. There is already $8 in the pot and B bets $2, which is all the money he has left. All other players fold, so A is the only one left to call B's bet. If A is a skilled player, he will calculate the odds that another Heart will be dealt and that he will have a flush. A knows that four Hearts have already been dealt (the two he holds and the two on the board), and so of the 47 cards he has not seen 9 of them will help and 38 will not. A's odds, then, of getting his Heart on the next card are roughly 4-to-1. That does not mean, however, that A should not bet. That depends on what he must bet and what he stands to win. B bet $2 into an $8 pot, making the pot value $10. A must bet $2 to stand a chance of winning $10. Thus A's "pot odds" are 5-to-1 and A, if he is skilled, will recognize that calling B's bet is a positive expectation decision. The odds that A is getting from the pot are bigger than the odds that he will hit his flush on the next card.

Unskilled players fail to comprehend these concepts. They do not understand the odds-based value of the cards they are dealt and tend to overvalue certain combinations of down cards, such as two suited cards. *See* Pet. App. 50a-51a. As a result, beginning players inevitably bet too many

hands. *See id.* They also make bets that in no way reflect the value of their hand, their odds of winning, or the amount of money at stake—unskilled players, to their detriment, are unconstrained by the principles of expected value.

B. In-Game Strategy Is Also Integral to Successful Poker Play.

While skill in probability and statistics is necessary for successful poker play, it is not enough. A skilled player must adapt his strategy to account for a number of additional variables. The importance of table position is one example. The person who acts last in a round of betting has a distinct strategic advantage as he has observed the behavior of all those who have checked, called, raised, or folded before him. *See* Pet. App. 54a. If everyone else has checked or folded, the last to act may conclude that his opponents have weak hands and raise as a matter of strategy rather than because his cards warrant it. A skilled player will likely use this tactic and recognize it when it is used. A skilled player also assesses his opponents' tendencies and continually updates his theory of what his opponents hold. "[T]he best players always entertain numerous hypotheses, which they weigh and balance against the opponent's actions." Nate Silver, *The Signal and the Noise: Why So Many Predications Fail—But Some Don't* 298 (2012).

Unskilled players fail to account for these subjective elements. They do not recognize how to exploit table position or when someone else is doing so. They are unlikely to evolve their strategy based on the behavior of their opponents. To the extent

unskilled players entertain any hypothesis at all, it is usually something along the lines of "If I play these cards, then I might get lucky."

The need for this subjective skill set distinguishes poker from games like chess, in which each player has complete information and for which, in principle, a computer can devise an optimal strategy given enough brute force processing power. However, researchers attempting to design a computer that can play poker have faced great difficulty because mere processing power alone is insufficient to render optimal solutions in poker. The subjective abilities of a skilled poker player—*viz.* the ability to "read" opponents, react to their tendencies, and adjust his behavior to prevent exploitation—are far more difficult to program. *See* Cabot & Hannum, 22 T.M. Cooley L. Rev. at 468 (noting failure of computer programs designed to play against humans).

IV. Because Of The Degree And Type Of Skill Involved, Poker Is Easily Distinguishable From The "Gambling" Games Listed In IGBA.

IGBA provides that "gambling" "includes but is not limited to pool-selling, bookmaking, maintaining slot machines, roulette wheels or dice tables, and conducting lotteries, policy, bolita or numbers games, or selling chances therein." 18 U.S.C. § 1955(b)(2). The Second Circuit essentially read this provision out of the statute. *See* Pet. 28-30 (criticizing the Second Circuit's failure to focus on the statute's illustrative games). But under IGBA properly construed, only games similar to those listed in § 1955(b)(2) are

proscribed, and poker bears no resemblance to these games in terms of the amount of skill required for successful play.

For IGBA's enumerated games, the players are either attempting to "beat the odds" or "get lucky," *i.e.*, to achieve some result other than the expected outcome (an outcome over which the player has virtually no control) or are gambling on the skillful actions or interactions of others. The same simply is not true of poker. Poker players are not trying to beat the odds, nor are they gambling on the actions or interactions of others—they are relying on their skill to try to beat their opponents. Poker players compete on a level field, and the data show beyond doubt that skilled players prevail in typical poker games. The same cannot be said of IGBA's enumerated games.

Pool-selling and book-making involve gambling on the skillful actions or interactions of others. Poker players, however, bet on their own skills and directly influence outcomes by their betting behavior. Slot machines, roulette wheels, and dice tables are all classic house-banked games in which the player competes against the house. Both the rules and the odds are fixed. As a result, and in sharp contrast to poker, the skill of the players is irrelevant—the odds of winning are rigged by the rules of the game to provide the house with an "edge," or advantage.

There is no skill involved in slot machine play. Though there is an embarrassment of riches when it comes to slot machine offerings, none of those myriad options allows for the player to exercise any modicum of skill. All the player can do is pull a lever or push a

button, which causes an electronic or mechanical device to churn through a pre-programmed formula to determine whether the player wins or loses. The result of that formula is carefully calibrated to ensure that, over time, the house wins and the players lose. *See* Anthony N. Cabot, Glenn J. Light, & Karl F. Rutledge, *Alex Rodriguez, a Monkey, and the Game of Scrabble: The Hazard of Using Illogic to Define the Legality of Games of Mixed Skill and Chance*, 57 Drake L. Rev. 383, 404 (2009) (explaining that games such as slot machines with "predetermined odds such that the payout is consistent over time, regardless of the player," are games of chance).

Roulette is no different. Because of the composition of an American roulette wheel, which has 38 spaces (a 0, a 00, and the numbers 1-36), and the rules of the game, the house has an edge of 5.26% on almost every bet a player can make (the sole exception is a bet in which the house has a 7.89% edge). Over time, the rules and structure of the game ensure that the house always wins. A player will fare no better by employing a "system" than he will by simply choosing random bets. There is literally no opportunity to exercise skill. *See* Cabot & Hannum, 22 T.M. Cooley L. Rev. at 466 (If you ask someone who plays poker to name "the top five poker players in the world, you will receive a meaningful response because skill is a determining factor. But if you ask who are the top five roulette players in the world, the response is utterly meaningless: roulette is purely a game of chance.").

In a certain sense, dice games are not quite as bad. Though there are some bets in dice games for which the house edge is greater than the edge in roulette, the overall house edge in these games—especially craps as it is usually played—is typically less than that of roulette, and the players have the option to choose the bets that are better than others. But all of the bets give the edge to the house, and the players therefore always lose in the long run. *See* George Remennik, *Mrs. Tschetschot's Busted Hand, Poker, and Taxes: The Inconsistent Application of Tax Laws on a Game of Skill*, 8 Cardozo Pub. L. Pol'y & Ethics J. 485, 493 (2010) (explaining that roulette and dice games "are structured in a manner that skews the odds in the casino's favor").

Lotteries, policy, bolita, and numbers involve no skill whatsoever. *See* Robert C. Hannum & Anthony N. Cabot, *Toward Legalization of Poker: The Skill vs. Chance Debate*, 13 UNLV Gaming Research & Rev. J. 1, 4 (2009). In all of these games, a player chooses a number or receives a ticket, which is then compared to a randomly drawn number or series of numbers. The numbers drawn are beyond the players' control and the odds are always (and often astronomically) against the players.

CONCLUSION

Skill predominates over chance in poker. It is thus unlike the "gambling" games listed in IGBA. The Second Circuit's mistaken analysis incorrectly elided this question, but this Court should grant the petition for certiorari to correct that error and reaffirm that poker—a game of Presidents and Senators—was not outlawed in IGBA but is a game of skill not reached by IGBA.

Respectfully submitted,

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