



Demystifying Slot Machines and Their Impact in the United States

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Executive Summary

In their more than 100 years of existence, slot machines have changed dramatically. Early, simple versions dispensed payouts of little value. The machines evolved and came to be known as the “one-armed bandits” that populated the first Las Vegas casinos and occupied the spouses of gamblers who preferred table games. As casino gaming became more accessible and acceptable, it became clear that the American public wanted more slots, and they wanted a greater variety of choices in the types of games they could play.

Largely in response to the demand for more slots and greater variety in gaming experiences, today there are more than 800,000 electronic gaming machines in commercial and tribal gaming locations in the United States. More than 380,000 men and women earn \$16 billion a year working for the United States commercial casino and gaming equipment manufacturing industries. Hundreds of thousands more are employed by Native American casinos.

A significant majority of gamblers say slot machines are their favorite games to play, and the slot machine’s share of the gaming floor at American casinos has grown from about 40 percent in the 1970s to almost 70 percent today. In Atlantic City casinos, for example, slot machines produced 45 percent of casino revenues in 1978; today they produce nearly 70 percent. There literally are thousands of games people can play with wagers from a few pennies to \$100 a play.

Though the number of slot machines in the United States has increased by many magnitudes since the 1970s and the number of casino visitors has grown to more than 60 million a year, the average amount wagered per casino visit, when adjusted for inflation, hardly has changed at all. In fact, in 2010, a visit to a casino is comparable in terms of cost and time expended to attending a play, ballgame, concert or many other leisure activities.

The competition to meet consumer demand has produced the dramatic evolution of the slot machine. Slot manufacturers need to build devices for a society with a decreasing attention span and an increasing demand for exciting, fast-paced entertainment, all in a marketplace overflowing with competing entertainment options. In an era when even grandparents play

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The prevalence of pathological gambling – approximately 1 percent of the adult population – is no higher today than it was in 1976, when Nevada was the only state with legal slot machines.

Nintendo Wii™, slot machines have kept pace. As a result, thousands of new machines are brought to market each year, and each new production cycle offers higher-quality audio and visual images featuring a wide variety of themes.

The single payline slot, once ubiquitous, now represents only about 30 percent of the machines in use. It has been substantially supplanted by devices that offer as many as 200 betting lines and features such as super jackpots from linked devices and interactive video displays. Future machines will be even more technology-driven. Gaming operators (i.e. casinos or slot machine owners) already have the ability, with server-based slots, to change the game offered by a single machine: for example, switching between a game that suits the characteristic preferences of weekend customers and one that better fits those of weekday customers.

As slot machines have evolved, regulation has become ever more stringent. Few industries are as heavily regulated as the gaming industry. The 13 states with commercial casinos employ more than 2,250 regulators and collectively spend approximately \$265 million regulating the industry. Each state has its own regulations and regulators, but all are committed to ensuring that the machines offered are reliable and fair. Regulations also prevent customers from being deceived. For example, regulators limit the frequency with which any given symbol appears in lines above and below the payline so that the games don't mislead gamblers by displaying "near-miss" combinations at disproportionate rates. Regulations also dictate a minimum percentage that each machine must return to players; this information always is available to customers.

There are critics of slot machines. Some blame slots for creating masses of new pathological gamblers and the problems that accompany an addiction. These critics argue that the machines somehow mesmerize players into a state of addiction. Some complain that large jackpots lure people to play when they should not. Others complain that small jackpots induce people to play longer than they should. Some criticize large-denomination bill acceptors for encouraging excessive play.

Here are the facts: The prevalence of pathological gambling – approximately 1 percent of the adult population – is no higher today than it was in 1976, when Nevada was the only state with legal slot machines. And, despite the popularity of slot machines and the decades of innovation surrounding them, when adjusted for inflation, there has not been a significant increase in the amount spent by customers on slot machine gambling during an average casino visit.

Introduction

Americans like slot machines. Since the 1970s, the slot machine's share of the gaming floor at American casinos has grown from about 40 percent to almost 70 percent. In Atlantic City casinos, for example, slot machines produced 45 percent of casino revenues in 1978; today, they produce nearly 70 percent.¹ More than 800,000 electronic gaming machines are installed in commercial and tribal gaming locations in the United States, including both slot machines and the less-numerous video poker machines. Nevada alone has almost 200,000 slot machines. Figure 1 summarizes the current distribution of slot machines across the country.

Because tribal gaming establishments are subject to a different regulatory structure and because many tribal casinos can offer only bingo-

Figure 1
U.S. Slot Machine Distribution By State, 2010

State	Slots at Commercial Casinos	Slots at Tribal Casinos	Slots at Non-Casino Venues	Total
Alabama		2,600		2,600
Alaska		80		80
Arkansas	1,171			1,171
Arizona		14,040		14,040
California		67,672		67,672
Colorado	15,639	1,320		16,959
Connecticut		15,007		15,007
Delaware	7,523			7,523
Florida	3,878	10,931		14,809
Indiana	23,341			23,341
Illinois	10,335			10,335
Idaho		4,041		4,041
Iowa	17,562	2,778		20,340
Kansas	584	3,758		4,342
Louisiana	21,849	6,370	14,691	42,910
Maine	1,000			1,000
Michigan	9,870	19,112		28,982
Minnesota		21,946		21,946
Mississippi	34,104	4,088		38,192
Missouri	18,615			18,615
Montana		1,189	19,918	21,107
Nebraska		379		379
Nevada	170,341	1,107	19,662	191,110
New Mexico	3,332	15,819		19,151
New Jersey	30,782			30,782
New York	12,469	11,979		24,448
North Carolina		3,320		3,320
North Dakota		3,448		3,448
Pennsylvania	24,754			24,754
Oklahoma	1,000	53,897		54,897
Oregon		7,489	12,342	19,831
South Dakota	3,619	2,204	8,996	14,819
Texas		1,600		1,600
Rhode Island	6,075			6,075
West Virginia	10,423		8,034	18,457
Washington		25,696		25,696
Wisconsin		17,964		17,964
Wyoming		1,245		1,245
TOTAL	428,266	321,079	83,643	832,988

Source: The Innovation Group (commercial and non-casino locations); Casino City Press Indian Gaming Industry Report (tribal locations)

A recent survey found the average gambling budget for a casino visit is \$108, which makes a trip to a casino comparable in terms of cost and time expended to attending a play, ballgame, concert, or other leisure activity.

type gaming machines – not true slot machines – this paper addresses principally those slot machines in non-tribal gaming venues.

In a national poll of casino gamblers, the majority – 59 percent – say they like slot machines better than other casino games.² The slot machine has earned its place in the hearts of American gamblers by delivering an experience that is both exciting and entertaining.

When considering gaming expansion, public policymakers have favored electronic gaming machines over other forms of gambling, often because they can be approved under existing state authority to conduct a lottery. Twenty-two states have approved electronic gaming machines, while only 14 states have authorized table games like blackjack and craps.³

In an era when grandparents play Nintendo Wii™, slot machines deliver the interactive experiences available through modern computer technology. They often feature high-quality audio and visual images that are exciting, amusing or informative, and draw on themes from vintage television shows, mythology or popular entertainers. They can offer complex games with multiple payouts and bonus rounds, mimic the simplest spin of a wheel, or reproduce favorite card games, such as poker.

Sophisticated computer chips direct the displays of slot machines, calculate their payouts on bets and guarantee the required payout rates, all while providing a reliable accounting of every transaction for public regulators, gaming operators and law enforcement agencies. Some slot machines are now networked through computer servers.

Slot machines are designed to provide the entertainment that customers demand. The games compete directly with the myriad of entertainment choices available today – sporting events, live performances, movies, video games and much more. A recent survey found the average gambling budget for a casino visit is \$108,⁴ which makes a trip to a casino comparable in terms of cost and time expended to attending a play, ballgame, concert, or other leisure activity. Slot machine makers vie fiercely for public favor in the competitive marketplace. In 2008, a single testing laboratory reviewed slot machine equipment produced by almost 400 manufacturers from around the world; it certified more than 52,000 gaming devices and more than 4,000 gaming systems.

Yet, despite the broad popularity of slot machines, many people do not understand how they work. In some instances, this lack of understanding has spawned a demonization of the machines. They have been blamed for social ills ranging from the alienation of American society to undermining family budgets to creating pathological gamblers. Some complain that large jackpots lure people to play when they should not. Others complain that small jackpots induce people to play longer than they should. Some criticize large-denomination bill acceptors for encouraging excessive play. Others think the games are too fast, or are deceptively presented because the odds for different outcomes can vary.

These criticisms ignore two basic truths about the machines. First, they remain popular because people have fun playing them. It is no secret that the odds favor the house on every game at a commercial gaming site. For the vast majority of customers, gambling is entertainment, and slot machines offer that entertainment without the pressure and anxiety some gamblers experience with other games. In a recent survey of more than 200 slot machine customers, nearly half said they liked slot machines because they are more accessible and less intimidating than other games. And, for many, slot machines simply are more entertaining than other alternatives.⁵ These customers decide how much money they are willing to invest in that entertainment. If it isn't fun, most will choose to do something else.

Second, slot machines are part of an industry that is regulated more rigorously than banks, brokerage houses or insurance companies. A government agency has to approve every screen display on a slot machine to ensure that it is clear and non-deceptive, while the designs of games are tested extensively in industrial laboratories to ensure their fairness. If a feature in a game is deemed contrary to the public interest, it is prohibited.

By evolving in response to fluctuating consumer tastes, slot machines have earned a prominent place on the gaming floor. This paper examines four basic aspects of slot machines today:

- The defining elements of the slot machines currently in use.
- How slot machine games are designed.
- How slot machines are tested and regulated.
- The social impacts of slot machine gambling.

Describing Slot Machines

In 1899, the first slot machine was developed by Charles Fey, a San Francisco inventor. His Liberty Bell machine evolved into a device that was usually played with tokens. Winners ordinarily received gum, mints or coupons they could redeem for drinks, cigars, tokens or cash. Jackpots on slot machines emerged in the 1920s, giving birth to the classic sound of tokens reverberating in the coin trays of slot machines. Not until the 1960s did manufacturers apply electronics to slot machines. Since then, the machines have changed rapidly.

Manufacturers currently produce two types of slot machines. Traditional slot machines are mechanical devices. They have physical reels that spin in a coordinated fashion to produce the outcome of each play, though they also may include electronic features. Purely electronic machines, the second category, use video technology to display images on a player's screen and use "virtual reels" in producing the outcome of a play. These virtual-reel machines can deliver a wide variety of games and make

possible the big jackpots, including progressive jackpots, that now are offered in many casinos.

Video poker machines share many characteristics of slot machines, but are specialized to replicate poker games. Video poker machines use computer technology to deal cards to the customer from a 52-card electronic deck. The game is played according to the rules of specific poker games — e.g., Jacks or Better draw poker or Texas Hold 'Em. If a player has a winning hand, the amount won is determined by his wager and the game's pay table. The games tend to vary little from the card games they reproduce. Because video poker accounts for only 13.7 percent of the electronic gaming machine market, because the design of video poker machines is defined by the poker games they replicate, and because video poker machines are subject to the same regulatory controls that apply to slot machines, this paper will not address them separately, but will treat them as one part of the diverse universe of slot machines.

Slot machines in the United States are subject to extensive laboratory testing and to careful regulation by state governments. The testing and regulation aim to make certain that the games are fair to customers and that the machines operate reliably. State laws prescribe a minimum percentage that each machine must return to players as winnings (e.g., at least 80 percent of the amounts wagered), although slot machines at most gaming venues pay out considerably more than the prescribed minimum.

The size of the bets accepted by slot machines can vary widely. In recent years, customers have gravitated towards low-denomination machines that offer multiple small bets on a single play (called “multi-line” machines). Many casinos have seen this revival in nickel slots and penny slots. At the other end of the spectrum, bet denominations on slot machines can be up to \$100 per play.

To ensure fairness, the outcome for each play is determined by a random number generator or central determination system. Because each play is an independent event, unrelated to any play before or after, there is no such thing as a “hot” slot machine or a “cold” one. A player’s chances of winning a given bet on that machine are the same every time he or she makes that particular bet.

After each game, a player can decide to play again – using the same wager configuration or a different one – or complete the gaming session by cashing out the credit meter for a redeemable ticket or coins. If the player makes another wager, the game process repeats in the same manner, independent of the results of any prior games.

Slot machines are programmed to keep complete records of the gambling activity conducted on them – both the amounts bet and the amounts paid out. These electronic records are kept in the format prescribed by state regulators and, in many instances, are delivered

electronically to those regulators on a daily basis. Regulators review the records to monitor the fairness of the games and to ensure correct and prompt payment of direct gaming taxes.

The revenues generated by individual slot machine games vary widely. The average daily win-per-slot-machine can be three times higher for a game in one casino than it is for a different game in a different gaming venue in a different market. Many economic factors influence the revenue that a machine generates, beginning with how busy the gaming venue is and how well the machine suits the customers in that market. In addition, some states limit the number of slot machines within the state or at a given location. Such artificial limits often prevent the supply of machines from fully meeting the market demand, so the revenue from each machine in those states often is higher.⁶

Other factors play a role as well. A machine's location on the gaming floor may well influence the revenue it produces. Machines in high-traffic areas ordinarily will produce greater revenue, though that is not uniformly true. The design of gaming floors is as much an art as it is a science. Also, slot machine customers vary by region in terms of the types of games they favor and the patterns of their play.

A few broad trends characterize slot machine activity in recent years:

- Since the 1970s, slot machines steadily gained popularity and share of the consumer's gambling budget, but their popularity has leveled off – and even declined slightly – over the last couple of years. To use the Atlantic City casino market as an example, in 1978, slot machines generated 45 percent of casino revenue. By 2002, the share of casino revenue due to slot machines was close to 75 percent. It has fallen to just below 70 percent since then.

HOW DOES A SLOT MACHINE WORK?

Although a single play of a slot machine takes but a few seconds, it involves many steps inside the machine. The player selects the amount he wishes to bet on each play. Once play begins, the machine's random number generator identifies a number for each field of the machine's screen. Through a two-step process, the computer processor within the machine (the "game processor") translates each number into the symbol that will display in each field.

First, based on a program developed for the game by its designer, the game processor assigns each randomly-generated number to a "reel stop." (In a mechanical slot machine, a reel stop is a location on the spinning reel; in a video slot machine, a reel stop is a location on a virtual reel.) Each reel stop is designed to produce a specific symbol for display on the screen. When the game's audio and visual effects are completed, the symbols are displayed.

At the same time, the game processor evaluates those symbols that will display on the "paylines" of the game's screen. If any symbol or group of symbols matches a winning combination, that payline or field is marked as a win. The processor calculates the amount won based on the odds incorporated into the game and the amount the customer bet. The screen notifies the player of the win, and also if a bonus is awarded. Every win is added to the player's credit meter. The machine's accounting meters record the result of the play, which also is transmitted to the casino's accounting and player reward system.

After each game, a player can decide to play again — using the same wager configuration or a different one — or complete the gaming session by cashing out the credit meter for a redeemable ticket or currency. If the player makes another wager, this process repeats in the same manner, independent of the results of any prior games.

Despite the popularity of slot machines and the decades of innovation surrounding them, there has not been a significant increase in the amount spent by customers on slot machine gambling on an average casino visit.

- State governments have participated in the growth of slot machine gambling by approving slot casinos at racetracks and other non-casino locations. Eight states allow slot machines or other electronic gaming machines but do not permit casino games like roulette, blackjack and craps.⁷
- A slot machine costs more than \$10,000 and has an average lifespan of seven years.
- Slot machines incorporate entertainment themes drawn from television shows (e.g., Wheel of Fortune), board games (e.g., Monopoly), movies (e.g., Top Gun) and popular culture (e.g., Elvis Presley). With enhanced computer power, the modern slot machine can provide complex and changing visual and audio displays that are reminiscent of video games. Like video games, some slot machine games now incorporate story lines, with players progressing from one level to another, all in the effort to provide a better experience for the customer.
- Ticket-in/ticket-out technology (TITO) largely has eliminated the coins needed to play yesterday’s slot machines. Current machines accept currency and certain forms of electronic payment and pay winnings in the form of a ticket that is redeemed with a casino cashier. As a result, players do not have to carry coins, the casino does not need to manage coins, and the clang and grime associated with coins are only a memory in most commercial gaming locations.
- When gaming operators introduced loyalty cards for customers – cards that provide benefits based on a customer’s gambling and spending at the gaming venue – they focused on slot machine play, which was relatively easy to track. Loyalty cards, which are adapted from similar cards offered by airlines, hotels and other consumer-oriented businesses, have been popular with customers.
- With few exceptions, slot machine games have become more complex. On these more advanced machines, players can place wagers on multiple lines at the same time and can win opportunities to qualify for bonus rounds of the game.
- Looking to the future, many slot machines will be linked together through central, server-based networks. Networking simplifies data collection, makes it easier to revise the terms of the game offered by machines and provides operators the ability to change the game offered on a machine. Another recent development is “community gaming,” which offers a bank of related or linked slot machines. When several individuals play these machines at the same time, the community gaming system offers the opportunity for players to jointly win entry into a bonus round and then play that stage together.

Despite the popularity of slot machines and the decades of innovation surrounding them, there has not been a significant increase in the amount spent by customers on slot machine gambling on an average casino visit. Four states with commercial casinos provide sufficient information to analyze, over a number of years, the average spending on slot machine gambling per casino visit. When adjusted for inflation, those results reflect very little growth in the average spending on slot machines during a commercial casino visit, even with the technological advances in slot machines over that period (See Figure 2 and Appendix A).⁸

These results are generally consistent with a recent study of average per capita spending on gambling around the world, which found that the United States ranks 14th among global gaming jurisdictions by that measure.⁹

In short, the innovations in slot machines have been necessary to maintain their position in the entertainment marketplace and have not fundamentally altered the role that gambling plays as a recreational activity for Americans. Public opinion surveys performed

since 1998 by Peter D. Hart Research Associates show relatively little fluctuation in the percentage of Americans who reported gambling at a casino during the previous year. From 1993 to 2009, between 25 percent and 35 percent of respondents reported gambling in a casino the previous year (See figure 3).

The slot machine has matured just as other leisure activities have. The first movies were silent, flickering images of black-and-white; they have been repeatedly transformed, first by the addition of sound, then color, and now computer-generated images jump off the screen in 3-D. Books have evolved from expensive hardback editions to paperbacks, to audio books and now to electronic books. Customers expect slot machines to incorporate the technological innovations surrounding them.

Designing Slot Machines

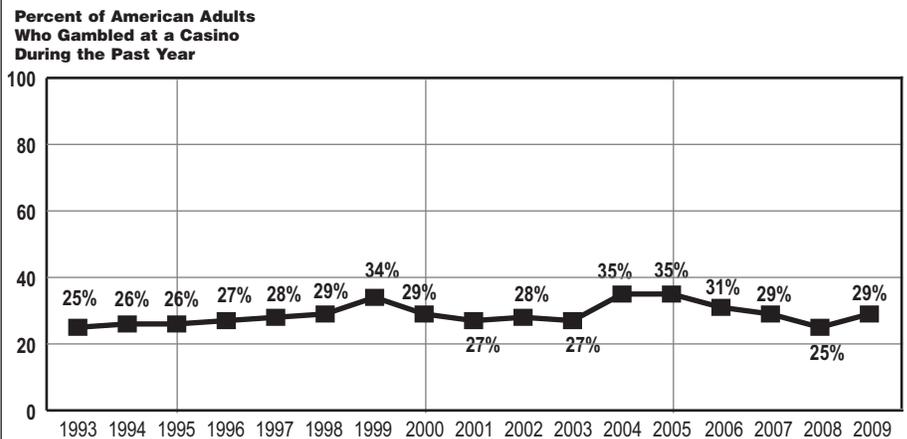
Slot machine manufacturers offer thousands of slot machine games, many of which can be configured to accept bets of different denominations

**Figure 2
Growth in Slot Machine Spending:
A Look at Four States**

State	Time Period Analyzed	Annual Growth in Average Slot Spend-per-Visit
Illinois	(2000-2009)	0.3%
Iowa	(1997-2009)	3.6%
Nevada	(1992-2009)	1.0%
New Jersey	(1984-2009)	2.1%

Source: Illinois Gaming Board, Iowa Racing and Gaming Commission, Nevada Gaming Control Board, New Jersey Casino Control Commission

**Figure 3
Casino Gambling Participation, 1993-2009**



Source: Harrah's Entertainment, Inc. (1993-1997); American Gaming Association (1998-2009)

or to provide different combinations of features. Manufacturers introduce scores of new games every year – only a few are smash successes, others do well enough, and some never meet much public favor. There is no magic formula for a successful game – customers decide which games are winners. Designers undertake a lengthy process in trying to develop a game that will deliver the entertainment experience customers want.

A designer ordinarily has a specific audience in mind for a new game. He may try a new approach to appeal to some specific group of customers, or he may try to improve on an existing machine that has been successful. To appeal to that audience, the designer can adapt the betting choices and payout tables in the game as well as the game’s look and feel.

Slot machines often are classified on a spectrum from “high-volatility” games to “low-volatility” games.

- High-volatility games have higher betting denominations and bigger jackpots, but fewer winning combinations. They generate lower amounts of customer time on the machine because many customers will spend their gambling budgets more rapidly in return for the excitement of playing for higher stakes. Customers who prefer high-volatility games often are less interested in a game’s audio and visual displays.
- Low-volatility games have lower betting denominations with more opportunities for the customer to win, though the payouts are smaller. Customers tend to play these games for longer periods of time, and the games ordinarily will deliver stronger themes or more developed audio and visual displays.

These classifications, of course, mark polar extremes; many games are designed to deliver a customer experience that falls between these poles. Although gaming venues will offer a range of machines along this spectrum, lower-volatility games often have greater appeal in “locals markets” than in destination resort markets like Las Vegas or Atlantic City. In locals markets, customers expect to visit casinos more often; many of those customers look to spend a longer time on a machine and thus place a greater value on a game’s theme or complexity. Destination resorts trend towards the higher-volatility games since more of their customers prefer to play for higher stakes.

Designers also must consider what entertainment themes will appeal to the target market. For high-volatility games, a more basic, gambling-oriented theme might work best. Low-volatility games may be more effective with a Hollywood or other entertainment theme that will prompt an affinity among many customers. Themes for slot machines are subject to regulation. Nevada, for example, bars themes that might have special appeal to those who are underage.¹⁰

Many of a designer's decisions focus on the structure of betting. What denominations should the machine accept as bets? Should there be bonus rounds? Should it be a multi-line game? By allowing the customer to place wagers on several lines at once (some machines offer as many as 200 lines), the multi-line machine increases the likelihood that each individual play will yield a win, though the amount of each win ordinarily is modest. In many instances in a multi-line game, the customer's win on a single line will be less than what he spends on all the lines he played. The partial win gives a player some satisfaction and stretches his gambling budget, allowing greater time playing the machine while spending the same amount of money. Multi-line machines often allow nickel or even penny bets per line.

Once a designer makes these basic decisions, many months of work remain. The designer must craft the game, blending theme and betting opportunities with the artwork and audio features that will be the game's signature on the gaming floor. Underlying these more creative elements are the mathematics of the betting and payouts, which must be programmed into the game, along with the engineering of the machine to ensure it will operate reliably and will interact consistently with other programs run by the gaming operator. The designer may need to accommodate game elements required by some foreign regulators to encourage responsible gaming – elements such as maximum bet limits, or restrictions on the time a customer may play a machine. As discussed on pages 16-17, these efforts to reduce pathological gambling by manipulating the machines have met with little success thus far.

A prototype of a new game is tested with customers to identify problems and potential improvements in design, math and engineering. When the designer is satisfied, he submits the game to a private testing laboratory that will verify its math and ensure it operates in the intended fashion.

Despite all of the audience analysis, rigorous engineering and creative design that go into a new game, the launch is an anxious process. Many games do not succeed. That is why manufacturers launch so many new titles every year, searching for the combination of game, visual display and theme that will ignite the level of customer excitement the gaming operator needs.

Regulating Slot Machines

Like every part of the gaming industry, slot machines are subject to exacting regulation by state agencies. The gaming regulatory agencies in the 13 states with commercial casinos deploy more than 2,250 people to oversee the commercial gaming industry at a cost of \$265 million.

The elements of slot machine regulation are the same in each state, though there are variations on particular points. The commitment in every

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state is to make sure (i) the manufacturer meets the strict criteria for business integrity that apply to the gaming industry in that state; (ii) the machines comply with demanding standards for reliability; (iii) the games are designed fairly and do not deceive the customer; and (iv) any disputes between customers and gaming operators over a machine's performance are investigated impartially and decided fairly.

Standards for business integrity are enforced through state licensing. Equipment manufacturers and their executives make extensive disclosures about their business and personal histories and financial conditions. The licensing state also conducts background investigations of applicants. Licenses are subject to periodic renewal and can be revoked for misconduct.¹¹

States require machines to be submitted to months of testing, either in state-run laboratories or in independent testing labs. Technical standards govern the movable and electronic parts of the machine that make it work – factors such as physical security, cabinet wiring, player safety, access doors, coin and currency compartments, bill acceptors, computer memory, switches, communications protocols, video monitors, touch screens, credit redemption, and ticket validation.

The labs are themselves certified and required to comply with ISO 17025 and ISO 17020 standards for technical competence in testing and inspection services.¹³ The goal at all stages of the testing process is to ensure that the game has proper security, is reliable, and gives every player an equal opportunity to win.

Some states – Michigan, Nevada, New Jersey and Pennsylvania – operate their own testing laboratories. Their labs apply the same types of detailed technical standards.¹³

Whether a state operates its own lab or relies on independent testing facilities, it will apply its own unique requirements to certain features of the machines, such as minimum payout percentages, betting limits or methods of handling currency. All states will satisfy themselves that the terms of play for a game are correctly and fully disclosed on the machine's screens so that every customer can readily understand how the game is played and how winners are determined. The final licensing decision is always made by a public regulator.¹⁴

Because regulators must approve every change in the screen display of a game, modifications of existing games represent the vast majority of game license reviews. The Nevada Gaming Control Board reviews up to 3,000 such modifications per year. Regulatory examination of an entirely new game or a completely new gaming platform, however, is a much broader and more time-consuming effort.

Regulators carefully examine the impact on consumers of game innovations, such as the fairly recent introduction of server-based slot machines. Because such slot machines are part of a central data processing network, the gaming operator instantly can change the games offered on

any specific machine. For example, the gaming operator could switch between a game that suits the characteristic preferences of weekend customers and one that better fits those of weekday customers. To ensure that customers are not startled or deceived by abrupt changes in the game offered on a machine, Nevada technical standards require that a machine be taken out of service for a set period of time whenever a game is changed.¹⁵ This mandatory downtime ensures that a customer does not experience a confusing change in the middle of a gaming session. Other jurisdictions have similar regulations.

State regulators also address concerns that games can mislead gamblers by displaying “near-miss” combinations at a disproportionate rate. For example, in a game that requires three cherries in a single line (the payline) to win, a near miss might display cherries in the first two fields of the payline, while a cherry would appear in the third field on the line just above or just below the payline. Regulators were concerned that such displays could mislead customers about their chances of winning. Although this concern applies only to the less-numerous single-line reel games rather than multi-line games, state regulators, slot makers and slot testing labs generally follow a policy that places a ceiling on potential near-miss displays for the top jackpot of a game. Although this requirement is not a written regulation, it applies to the blank symbols that are above or below the top jackpot symbol in the game, specifying that those blanks cannot appear on the payline more than six times as often as any other symbol. The effect of that requirement is to place a ceiling on how frequently the top jackpot symbol may appear in a near-miss position immediately above or below the payline. By allowing symbols to appear with somewhat differing frequency (up to the 6:1 ratio), the requirement accommodates the mathematics of contemporary games, which rely on such variations to produce the complex games and bigger jackpots that customers enjoy. In California, some tribal casino regulators take the same approach, but apply a 9:1 ratio, while gaming regulators in Ontario, Canada, apply a 12:1 ratio.¹⁶

Once a slot machine game is installed on the gaming floor, it is constantly monitored and inspected according to an intricate system of internal controls and audit programs. These measures are designed to detect efforts to compromise the integrity of the machines and to verify that the devices in play are identical to those that have been certified in the lab. Each machine has a unique electronic signature, which is the computer equivalent of a fingerprint. Using special tools, regulators can verify that the computer programs running on each slot machine are identical to those approved in the lab.

The regulatory agencies also manage customer complaints about slot machines. Such complaints may question whether the machine recorded the points earned for a loyalty card, whether a bonus should have been awarded, or whether a jackpot was correctly won or not won. If the

Though critics have argued that the machines somehow mesmerize players into a state of addiction, those assertions are not supported by scientific research and data about gamblers, the gaming industry and pathological gamblers.

complaint questions the electronic or mechanical operation of the machine, investigators disable the machine until they have completed their examination.¹⁷ Independent testing labs provide computer forensics teams to investigate machine performance outside normal parameters. If the customer is not satisfied by the casino's response to the complaint, he can pursue it through an administrative process and also in court.

Social Impacts of Slot Machine Gambling

When lawmakers consider whether to legalize gaming in their communities, they weigh the impact that gaming can be expected to have. The broadest benefits from slot machines go to customers. As an entertainment activity, slot machine gambling affords a mix of excitement, suspense and fun that customers value.

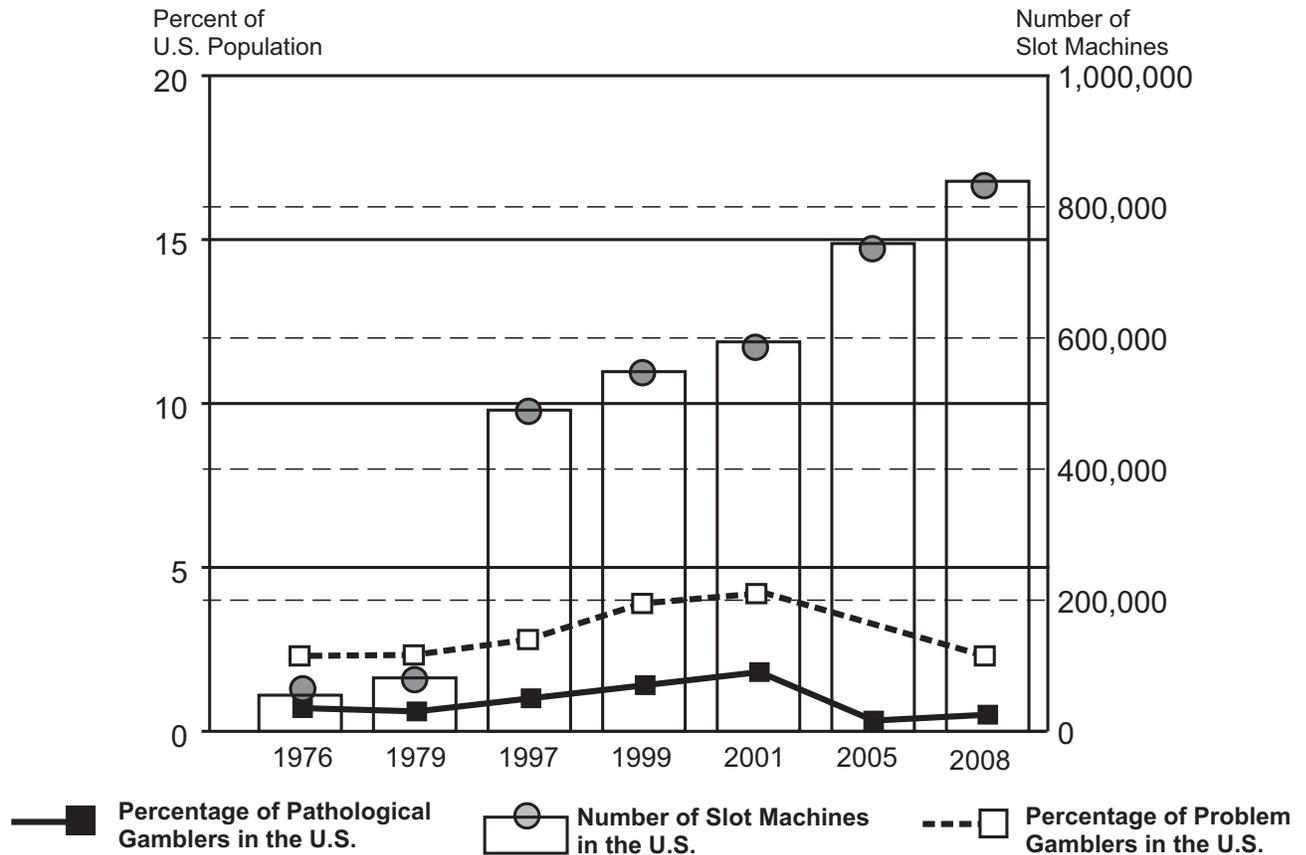
More than 60 million Americans visited casinos last year. A trip to a gaming venue provides a break from everyday life, as well as a social experience in a public space shared by a wide range of customers. Many people visit a casino with family and friends, often mounting a group expedition with the flavor of an adventure. Casinos are good places to meet new friends or people watch. The upbeat atmosphere encourages people to converse easily and be friendly. For some groups of customers, like the elderly, the social aspects of the casino may be especially attractive.¹⁸

The commercial casino industry, significantly fueled by the popularity of slot machines, is a considerable economic engine. It directly employed more than 350,000 workers in 2009, paying them more than \$14 billion in compensation. The commercial casino industry also paid more than \$5.5 billion in direct gaming taxes to support public activities – such as education, programs for senior citizens, and infrastructure projects – and generated many billions more in income tax, sales tax and other public revenue contributions. Manufacturers of gaming equipment employed 30,000 people who earned an estimated \$2.1 billion in salaries and wages, and generated a proportionate level of tax payments.¹⁹

Some commentators have attempted to connect pathological gambling to the evolution and design of slot machines. Pathological gambling – recognized by the American Psychiatric Association as a medical condition involving loss of control when gambling – certainly damages individuals, families and the greater society. Only anecdotal evidence, however, has been presented to suggest a unique link between pathological gambling and slot machines. Though critics have argued that the machines somehow mesmerize players into a state of addiction, those assertions are not supported by scientific research and data about gamblers, the gaming industry and pathological gamblers.

The critics rarely address a central fact: that the prevalence of pathological gambling in the United States has been remarkably consistent over time, at about 1 percent of the adult population. That percentage has

Figure 4
Impact of Slot Machine Expansion on Prevalence of Pathological and Problem Gambling*, 1976-2008



Sources:

Commission on the Review of the National Policy Toward Gambling (1976). Gambling in America: Final Report of Commission for the Review of National Policy Toward Gambling, 49-50.

Kallick, M., Suits, D., Dielman, T., & Hybels, J. (1979). "A Survey of American Gambling Attitude and Behavior." University of Michigan Survey Center, Institute for Social Research.

Shaffer, H. J., Hall, M. N., & Vander Bilt, J. (1997). "Estimating the Prevalence of Disordered Gambling in the United States and Canada: A Meta-Analysis." Boston, MA: Division on Addictions, Harvard Medical School.

National Research Council, et al. (1999). "Pathological Gambling: A Critical Review." (Report prepared for the National Gambling Impact Study Commission), 16-17.

Shaffer, H. J., Hall, M. N. (2001). "Updating and refining meta-analytic prevalence estimates of disordered gambling behavior in the United States and Canada." Canada Journal of Public Health, 92(3), 168-172.

Perry, N., Stinson, F.S., & Grant, B.F. (2005). "Comorbidity of DSM-IV Pathological Gambling and Other Psychiatric Disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions." Journal of Clinical Psychiatry, 66(5), 564-574.

Hwang, I., Kessler, R.C., LaBrie, R., Petukhova, M., Sampson, N.A., Shaffer, H.J., & Winters, K.C. (2008). "DSM-IV Pathological Gambling in the National Comorbidity Survey Replication." Psychological Medicine, 38(4), 1351-1360.

Slot machine data is based on information found in International Game Technology's annual reports and data supplied by the Nevada Gaming Control Board and New Jersey Casino Control Commission.

*According to the *DSM-IV*, pathological gambling is a persistent and recurrent maladaptive gambling behavior as indicated by certain characteristics. The term is used to describe the most severe level of a gambling disorder. Problem gambling is a term commonly used to describe the less severe, or sub-clinical, forms of disordered gambling in which the individual has gambling-related problems but not of sufficient severity to meet diagnostic criteria for pathological gambling.

held steady for nearly 35 years,²⁰ during which time many new jurisdictions have introduced slot machines, and those machines have captured a larger and larger share of existing gaming floors (see figure 4).

In some jurisdictions with new or expanded gaming opportunities, it appears that the novelty effect of new forms of gambling, including slot machines, has resulted in a temporary increase in problem gambling. However, recent research has shown that, over time, the population adjusts to the availability of gaming, and problem gambling rates return to near previous levels. Additionally, researchers have observed that jurisdictions with long exposure to legalized gambling and slot machines, such as Nevada, have not developed prevalence rates of pathological gambling higher than the national average.²¹ If the machine were the culprit, a major increase in the number of machines would be expected to trigger a parallel growth in the percentage of pathological gamblers in the adult population. It has not.

These patterns of pathological gambling suggest that the problem should not be addressed as a one-dimensional question for which the best and only solution is to reduce opportunities for gambling. Many other factors need to be part of a public health strategy to reduce pathological gambling, including evidence-based assessment, prevention, interventions, and treatment strategies.²²

In addition, an important research finding in recent years is that people who have trouble controlling their gambling often struggle with other behavioral problems and mental health disorders. A national study of more than 43,000 Americans funded by the National Institutes of Alcohol Abuse and Alcoholism found that almost three-fourths of pathological gamblers abused alcohol (73.2 percent), more than a third used illegal drugs (38.1 percent) and three-fifths were addicted to tobacco (60.4 percent). A large share suffered from a mood disorder (49.6 percent), anxiety disorder (41.3 percent) or personality disorder (60.8 percent).²³

Other studies have reported similarly high rates of “comorbidity” – that is, people diagnosed with pathological gambling often have other mental health and behavioral problems, as well. A landmark study of mental health in America noted that, among those individuals who developed pathological gambling, 23.5 percent developed pathological gambling before any other psychiatric problem, 74.3 percent developed pathological gambling after experiencing other psychiatric problems, and 2.2 percent developed pathological gambling and other psychiatric problems at the same time.²⁴ Other studies reinforce these results.²⁵ Although more research is needed to determine whether one type of problem causes any other, these findings emphasize the complexity of the problems pathological gamblers face. Further, research has shown that addiction usually reflects a flawed relationship between a vulnerable person and the object of his addiction, not some defect inherent in that product. Cutting-edge researchers have concluded that “the specific objects of addiction play a less central role in the development of addiction than previously thought.”²⁶ A plain implication of this research is that

attributing pathological gambling to the design of slot machines is simplistic. Some people have difficulty gambling responsibly, as others are prone to use credit cards irresponsibly or to drive cars recklessly. The problem is not in the products they abuse, but within the individuals.

These conclusions are reinforced by the recent settlement of the almost decade-long lawsuit over video lottery terminals in Quebec. In *Brochu v. Loto-Quebec*, a class-action lawsuit, the plaintiffs claimed that electronic gaming machines were designed to make gamblers addicted by creating the “illusion of control” over the games. After a trial that lasted more than a year, the plaintiffs settled for less than 10 percent of their initial demand and signed a stipulation that the machines are not “the cause of pathological gambling.” The presiding judge specifically approved that stipulation as supported by the evidence presented at trial.

Bearing out these results, recent efforts by regulators in Australia and Canada have met little success in reducing pathological gambling by manipulating gaming machines. The measures they have implemented include imposing betting limits, restricting the time a customer can play a machine or requiring anti-gambling messages to appear on slot machines’ video screens. For every such measure, however, gamblers may deploy a compensating strategy. Faced with maximum bet limits, gamblers can play faster. Confronting a slow machine or mandatory “time outs” from play, they can extend their gambling per day. They also can avoid such social controls entirely by gambling in unregulated environments, including illegal ones.²⁷ In short, research to date generally shows that most machine modifications, including reductions in the speed of the machines and limits on amounts that gamblers can wager, are not effective in reducing pathological gambling.²⁸

In addition, research has found that pathological gambling symptoms can develop from types of gambling that “have little in common [with each other].”²⁹ Since loss of control can arise in people who play different games with different characteristics, there is little reason to assume that changing the rules for gaming machines will prevent a person from losing control. Indeed, pathological gamblers can have success in regaining control over their gambling without formal treatment or help.³⁰ This phenomenon, called “natural recovery,” does not justify inaction on pathological gambling, but it highlights the importance of individual action in controlling the problem.

When an activity poses no risk for 98 to 99 percent of the adult population, measures to protect the few who may be at risk should not unnecessarily disrupt the interests of the vast majority. In this respect, legalized gambling is no different from other activities – including eating, consuming alcoholic beverages, driving a vehicle or surfing the Internet – that can cause injury if done in an unsafe manner. Effective policies for pathological gambling concentrate on helping the people who have the problem rather than trying to modify their behavior indirectly by changing the rules, appearance or patterns of specific games.

When an activity poses no risk for 98 to 99 percent of the adult population, measures to protect the few who may be at risk should not unnecessarily disrupt the interests of the vast majority.

Conclusion

Slot machines bring fun and excitement to a large number of Americans every day. They are designed to entertain and are regulated and tested throughout their lifespan to ensure fairness for players. These machines also have been the engine behind the growth of an industry that contributes jobs, economic development and substantial tax dollars to gaming states and communities. And, while there are those who cannot gamble responsibly, scientific evidence suggests no special link between slot machines and pathological gambling.

Competing in the bruising entertainment marketplace, slot machine makers have constantly innovated, keeping pace with customer demands and the trend toward increasing technological sophistication in all aspects of entertainment, from video games to motion pictures. Through the development of new games and gaming systems, gaming machine designers are creating increasingly satisfying customer experiences. Their success can be measured by the fun their customers have playing their games.

Endnotes

¹New Jersey Casino Control Commission. Historical Statistics: Operating Statistics: www.state.nj.us/casinos/financia/histori/, Accessed: Feb. 22, 2010.

²VP Communications and Peter D. Hart Research Associates for the American Gaming Association, *2010 State of the States: The AGA Survey of Casino Entertainment*.

³This paper addresses only gaming legalized for commercial venues, so these descriptions omit tribal gaming establishments, which operate under varying regulatory regimes.

⁴VP Communications and Peter D. Hart Research Associates, for American Gaming Association, *2010 State of the States: The AGA Survey of Casino Entertainment*.

⁵VP Communications and Peter D. Hart Research Associates for American Gaming Association, *2010 State of the States: The AGA Survey of Casino Entertainment*.

⁶State-imposed limits on the number of slot machines are likely to produce lower overall slot machine revenue, and thus to generate lower tax revenues.

⁷Florida, Maine, Montana, New Mexico, New York, Oklahoma, Oregon and Rhode Island. Previously, Delaware and Pennsylvania were included in this group, but as of 2010, both states have approved table games to be offered at their commercial gaming venues.

⁸Each state was studied for the period during which the data was available, and those periods varied, as indicated in the chart in the text. In each case, however, the period included time during which slot machines were increasing significantly in their sophistication, so each state's experience is illuminating. For each state, as explained in Appendix 1, the analysis used a reported statistic for customer visits, or casino admissions, which was recorded consistently over time, but which may have included people who did not actually gamble at slot machines. As those statistics were each measured consistently during the relevant time period, however, they provide reliable results for our purpose, which is to examine the trend in slot machine spending per casino visit, even if the amount of the estimated spending per visit is itself overstated or understated.

⁹Pryor, F.L. (2008). "Macro-Determinants of Gambling in Industrialized Nations." *Kyklos*, 61(1), 101-113.

¹⁰Nev. Reg. 14.025.

¹¹E.g., Pennsylvania Gaming Regulations, §421.1, *et seq.*

¹²The International Organization for Standardization (ISO) is a prominent worldwide body with more than 80 member countries responsible for publishing industry standards of good practice. These standards are embraced by both government and private-sector firms to ensure that products and services are suitable for use in a variety of regulated industries and markets. All aspects of the lab's internal operations are regularly evaluated by an external authoritative entity for compliance with stringent ISO standards.

¹³E.g., Mississippi Gaming Regulations, § VIII. "Technical Standards for Gaming Devices and On-line Slot Systems;" Nevada Gaming Control Board, "Technical Standards for Gaming Devices and On-line Slot Systems," http://gaming.nv.gov/stats_regs/reg14_tech_stnds.pdf.

¹⁴An example is the rejection by the California Department of Justice of multistation roulette games. GLI-11, the predominant technical standard in California, establishes the allowances for electro-mechanical random number generators (RNG) in the determination of game outcome. These devices typically use a microprocessor-controlled motor to spin the wheel and a microprocessor-controlled blower to release the ball into the well at varying speeds. Software determines, at random, how fast the wheel will spin and how fast the ball will be released. Although the game meets the full technical specifications of GLI-11, the California Department of Justice (CA DOJ) has made an interpretation that this is still the game of roulette and, therefore, state law prohibits it.

¹⁵Nevada Technical Standards, § 1.140.

¹⁶E.g., N.R.S. § 14.040(3); 58 PA Code Section 461.7(5)(ii); 11 MO CSR § 45-5.190(J); Barona Tribal Technical Standards for Gaming Devices, § V(3)(a)(ii). Most multi-line games do not display lines above or below paylines that are not themselves paylines. Accordingly, displays for multi-line games cannot ordinarily suggest that the customer has just missed a certain winning combination.

¹⁷E.g., Missouri Gaming Regulations, §45-5.235.

¹⁸Desai, R.A., Desai, M.M., and Potenza, M.N. (2007). "Gambling, health and age: Data from the National Epidemiologic Survey of Alcohol and Related Conditions." *Psychology of Addictive Behaviors*, 21(4), 431-440.)

¹⁹VP Communications and Peter D. Hart Research Associates for the American Gaming Association, *2010 State of the States: The AGA Survey of Casino Entertainment*.

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- ²³ Petry, N.M., Stinson, F.S., & Grant, B.F. (2005). "Comorbidity of DSM-IV Pathological Gambling and Other Psychiatric Disorders." *Journal of Clinical Psychiatry*, 66(5), 564-574.
- ²⁴ Kessler, R.C., Hwang, I., LaBrie, R., Petukhova, M., Sampson, N.A., Winters, K.C., & Shaffer, H.J. (2008). "DSM-IV pathological gambling in the National Comorbidity Survey Replication." *Psychological Medicine*, 38(9), 1351-1360.
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GLOSSARY

- Bonus game, bonus round** – awarded on some games, usually when a specific symbol or combination of symbols lands on a played line. Customers may have to make an additional wager to play the bonus game.
- Community gambling** – a bank of connected slot machines which allow multiple players to jointly play bonus rounds on the machines.
- Game** – the combination of theme and betting pattern that shapes the customer’s experience of playing a specific machine. Games are controlled by game-specific software that is responsible for the appearance and behavior of the game.
- Game processor** – a microcomputer that serves as the “brains” of the gaming machine. The game processor controls all game functions, including as coin acceptance, coin dispensing, data accumulation and accounting, random reel spin/stop sequences, video graphics and audio effects.
- High-volatility games** – slot machine games with higher betting denominations and bigger jackpots, but fewer winning combinations.
- Low-volatility games** – slot machine games with lower betting denominations with more opportunities for the customer to win, though the payouts are smaller.
- Mechanical slot machine** – features actual physical reels that activate for game play when the “play” button is pressed, or the slot handle is pulled. A mechanical slot machine can have three, four or five spinning reels, and often will have an LCD (liquid crystal display) in the top box for bonus games.
- Multi-line machines** – slot machines that allow the player to place wagers on multiple lines on the machine’s display screen for a single play.
- Near misses** – A concern principally for single-line machines, this arises when most of a winning combination of symbols appear on a payline and the other winning symbol appears on lines immediately above or below the payline.
- Pay line** – any line of symbols on the screen of a slot machine for which certain outcomes (symbol displays) will win money or other bonuses for the customer.
- Pathological gambling** – according to the *DSM-IV*, a persistent and recurrent maladaptive gambling behavior as indicated by certain characteristics. The term is used to describe the most severe level of a gambling disorder.
- Pay table** – the matrix of outcomes and payouts for each game, which reflects the odds adopted for each outcome. Regulators review and approve the pay tables for every game.
- Progressive jackpot** – offered on machines that allocate a percentage of the value of each bet to a top jackpot that continues to accrue until a customer wins that top award. For many progressive jackpots, the top award is accumulated from a number of interconnected machines.
- Reel stop** – position at which a reel may stop after it spins; in a video slot machine, the reel stop is on the virtual reel.
- Slot machine, slots** – the hardware. Most machines are composed of a base cabinet and a top box. Operational hardware components, including the microprocessor, power supply, coin hopper, ticket printer and bill acceptor, are located in the base cabinet. Hardware to support bonus functions, such as wheels, bonus reels and LCD displays, are located in the machine’s top box.
- Video slot machine** – features game play on a video monitor and uses “virtual reels” to generate the symbols that are displayed and determine the outcome of the play.

Appendix A

Year-to-Year U.S. Slot Spending Trends: Preliminary Results

Spectrum Gaming Group – March 2010

In an effort to quantify changes in average spending on slot machine gaming during recent years, Spectrum looked to those jurisdictions with (i) consistent records of attendance at commercial gaming venues and (ii) long periods of time with few changes in gaming rules. Ultimately, Atlantic City, N.J.; Las Vegas, Nev.; Iowa; and Illinois were selected for this analysis.

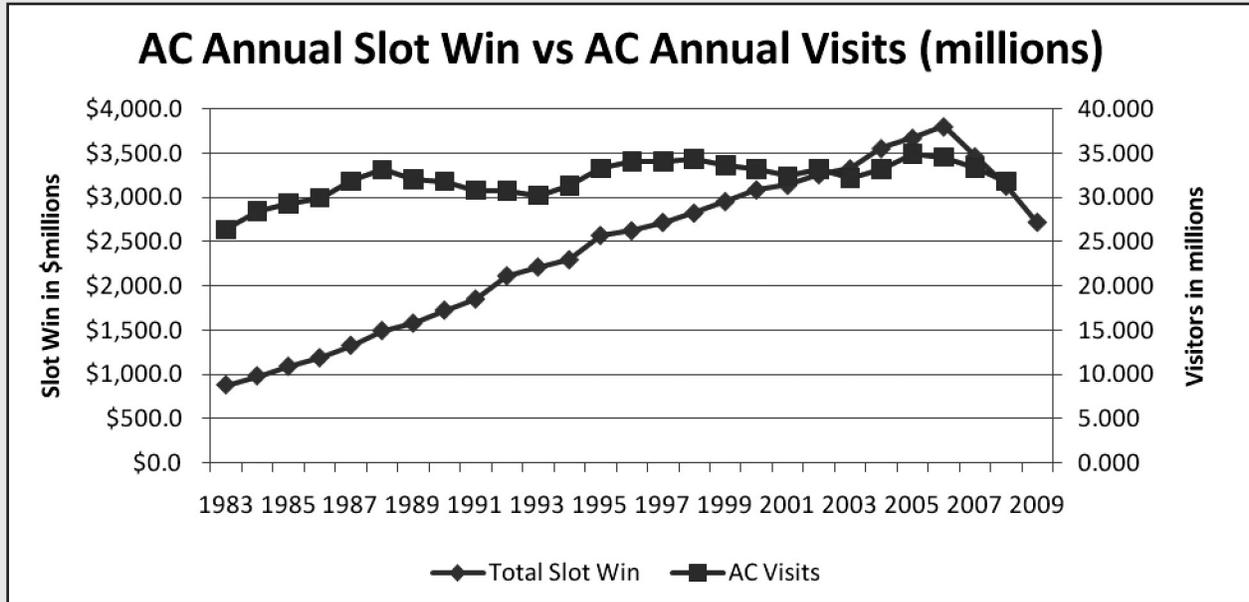
Some cautions must apply to examining the results. For Las Vegas and Atlantic City, “visitor” does not necessarily equate to “gambler,” let alone “slot player.” However, the visitor data in both markets has been collected in a consistent manner over long periods of time, so these data are internally consistent and comparable year-to-year. Similarly, for Iowa and Illinois, not all customer “admissions” represent individuals who at play slot machines, and some admissions represent repeat visitors. Again, within each jurisdiction, the data was collected in as consistent a manner over time as is available, and is therefore generally comparable year-over-year. This analysis is therefore not an attempt to estimate actual slot spending per player, but rather to gauge relative changes in such spending levels during given periods of time.

Regarding Atlantic City, it is important to note that the downward spending trend in recent years (from 2007 to 2009) is due to more than the economic downturn, which impacted each of the selected jurisdictions. Atlantic City’s spending decline preceded the downturn and is more pronounced than in other markets. This is due in part to new and significant competition in neighboring states, mainly venues in Pennsylvania and, to a lesser degree, in Yonkers, N.Y. Increased competition has led to a decline in both Atlantic City visitation and (to some extent) trip spending among casino patrons. Additionally, the decline in slot spending may be augmented by the fact that competing jurisdictions currently offer only slots, so Atlantic City visitors may be comprised more of table players and relatively fewer slot players than in the past. While these effects cannot be readily quantified or filtered out, they should be noted.

Each of the selected jurisdictions publishes slot machine gambling revenue per year. By dividing those revenue totals by the available “visit” or “admission” data for that jurisdiction, an estimate was derived for the average amount spent on slot machine gambling for each customer visit or admission. Although there are uncertainties about the accuracy of these figures, as described above, the movements in these figures from year to year provide a good measure of the trends in slot machine spending, and thus whether the slot machine share of customer gambling budgets has increased, declined or stayed relatively stable. The consumer price index was used to adjust the results of this analysis for the effects of inflation.

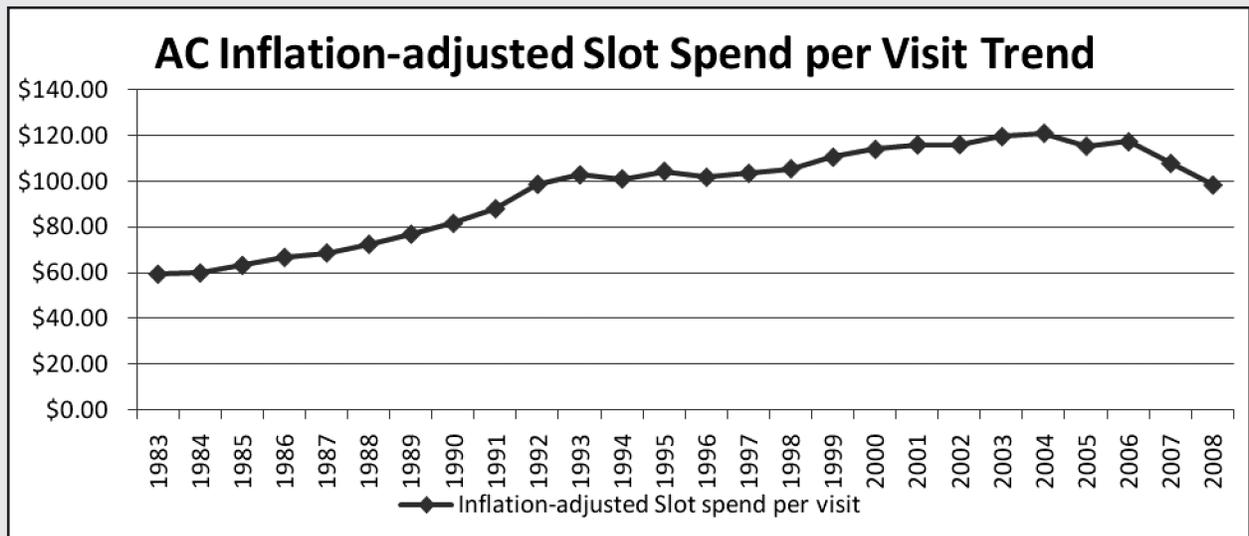
Atlantic City, N.J.

Atlantic City had the longest period of comparable slot revenue and visitation data. Here, total slot revenue is paired with total visitor estimates provided by the South Jersey Transportation Authority, beginning in 1983, once gaming had become fairly established.



Source: New Jersey Casino Control Commission, South Jersey Transportation Authority

The preceding Atlantic City data result in the following average slot gaming spend per visitor trip estimates, adjusted for inflation to 2008 dollars.¹



This generally increasing trend represents a 2.1 percent average annual yearly increase, adjusted for inflation, as detailed in the following table.

**ATLANTIC CITY CASINO INDUSTRY
SLOT MACHINE WIN
1979 - 2009**

(In Millions, Except Per Visit)

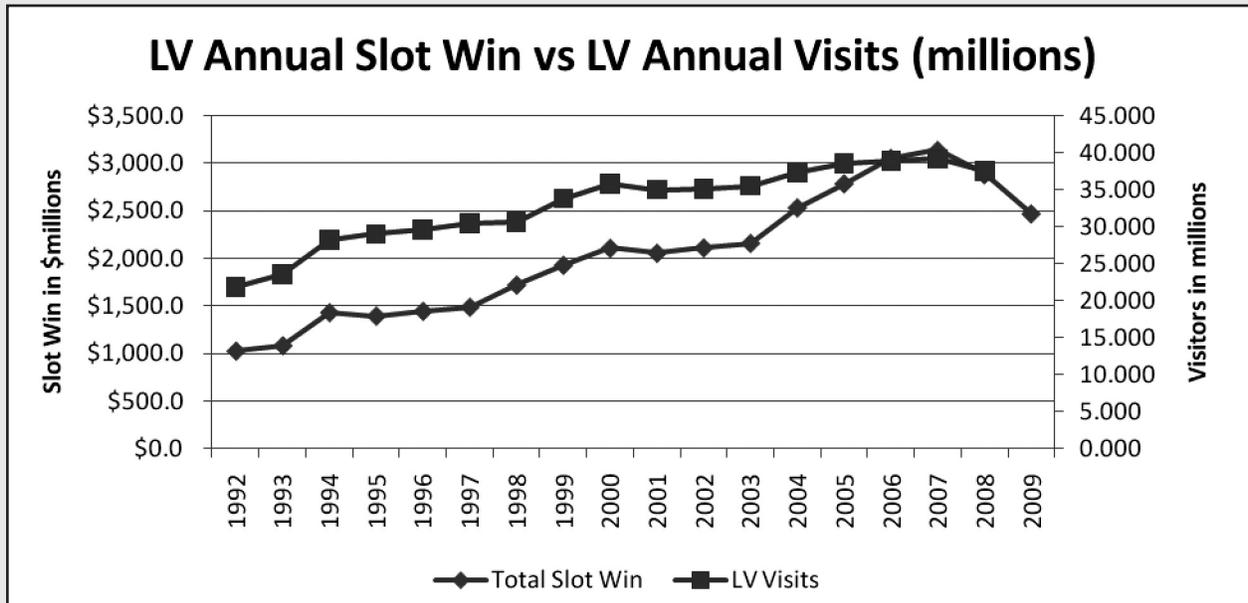
	Industry Total	Annual Percentage Change	AC Visits**	Annual Percentage Change	Est. Average Slot Spend Per Visit (actual dollars)	Percentage Change in CPI*	Inflation- adjusted Slot Spend Per Visit (in 2008 dollars)	Year-to- year Percentage Change	Cumulative Average Annual Change
1983	\$877.9		26.361		\$33.30	3.2%	\$59.41		
1984	\$980.1	11.6%	28.466	8.0%	\$34.43	4.3%	\$59.94	0.9%	
1985	\$1,087.7	11.0%	29.326	3.0%	\$37.09	3.6%	\$63.24	5.5%	3.2%
1986	\$1,185.4	9.0%	29.932	2.1%	\$39.60	1.9%	\$66.77	5.6%	4.0%
1987	\$1,326.1	11.9%	31.845	6.4%	\$41.64	3.6%	\$68.71	2.9%	3.7%
1988	\$1,493.6	12.6%	33.138	4.1%	\$45.07	4.1%	\$72.52	5.5%	4.1%
1989	\$1,577.2	5.6%	32.002	-3.4%	\$49.28	4.8%	\$76.93	6.1%	4.4%
1990	\$1,724.3	9.3%	31.813	-0.6%	\$54.20	5.4%	\$81.68	6.2%	4.7%
1991	\$1,851.1	7.4%	30.788	-3.2%	\$60.12	4.2%	\$88.08	7.8%	5.1%
1992	\$2,113.8	14.2%	30.705	-0.3%	\$68.84	3.0%	\$98.79	12.2%	5.9%
1993	\$2,214.6	4.8%	30.225	-1.6%	\$73.27	3.0%	\$102.95	4.2%	5.7%
1994	\$2,297.1	3.7%	31.321	3.6%	\$73.34	2.6%	\$101.14	-1.8%	5.0%
1995	\$2,572.7	12.0%	33.272	6.2%	\$77.32	2.8%	\$104.46	3.3%	4.9%
1996	\$2,626.0	2.1%	34.042	2.3%	\$77.14	3.0%	\$101.90	-2.5%	4.3%
1997	\$2,720.1	3.6%	34.070	0.1%	\$79.84	2.3%	\$103.63	1.7%	4.1%
1998	\$2,825.2	3.9%	34.300	0.7%	\$82.37	1.6%	\$105.59	1.9%	4.0%
1999	\$2,955.9	4.6%	33.652	-1.9%	\$87.84	2.2%	\$110.67	4.8%	4.0%
2000	\$3,088.0	4.5%	33.184	-1.4%	\$93.06	3.4%	\$114.09	3.1%	4.0%
2001	\$3,141.3	1.7%	32.423	-2.3%	\$96.88	2.8%	\$116.07	1.7%	3.8%
2002	\$3,261.7	3.8%	33.187	2.4%	\$98.28	1.6%	\$116.17	0.1%	3.6%
2003	\$3,327.3	2.0%	32.224	-2.9%	\$103.25	2.3%	\$119.67	3.0%	3.6%
2004	\$3,556.5	6.9%	33.230	3.1%	\$107.03	2.7%	\$121.15	1.2%	3.5%
2005	\$3,674.0	3.3%	34.924	5.1%	\$105.20	3.4%	\$115.51	-4.7%	3.1%
2006	\$3,803.7	3.5%	34.534	-1.1%	\$110.14	3.2%	\$117.41	1.6%	3.1%
2007	\$3,464.5	-8.9%	33.316	-3.5%	\$103.99	2.8%	\$107.94	-8.1%	2.6%
2008	\$3,132.5	-9.6%	31.813	-4.5%	\$98.47	3.8%	\$98.47	-8.8%	2.1%
2009	\$2,721.8	-13.1%				-0.4%			

**<http://www.sjta.com/sjta/pdfs/2008%20Annual%20Visitors%20Report.pdf>

*U.S. Bureau of Labor Statistics: <ftp://ftp.bls.gov/pub/special.requests/cpi/cpiiai.txt>

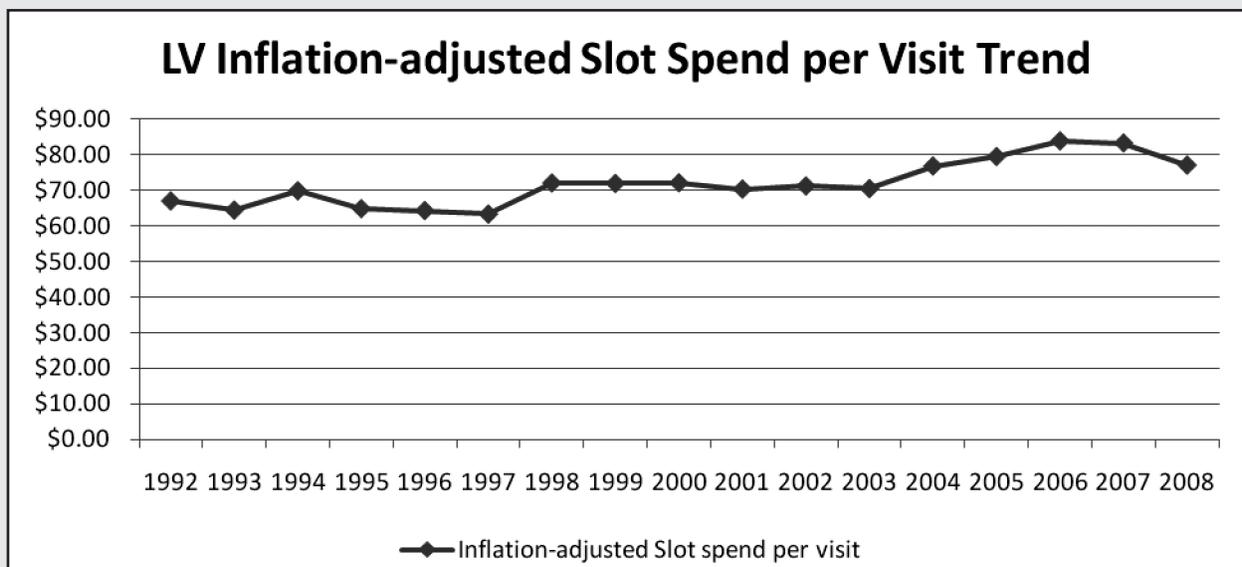
Las Vegas, Nev.

While Las Vegas has a longer gaming history than Atlantic City, comparable statistics for the purposes of this analysis date back to 1992, as shown below. City visitor numbers provided by the Las Vegas Convention and Visitors Authority are paired with slot revenues for operators located near the Las Vegas Strip that generate more than \$72 million annual total gaming revenues.



Source: Nevada Gaming Commission, Las Vegas Convention and Visitors Authority

The Las Vegas data above result in the following average slot gaming spend per visitor trip estimates, again adjusted for inflation to 2008 dollars.



The overall Las Vegas trend in average slot spend per visitor over the last 18 years has been much flatter than that for Atlantic City. The average change is 1.0 percent, after inflation, as detailed on the following page.

**LAS VEGAS/CLARK COUNTY
SLOT MACHINE WIN
1992 - 2009**

(In Millions, Except Per Visit)

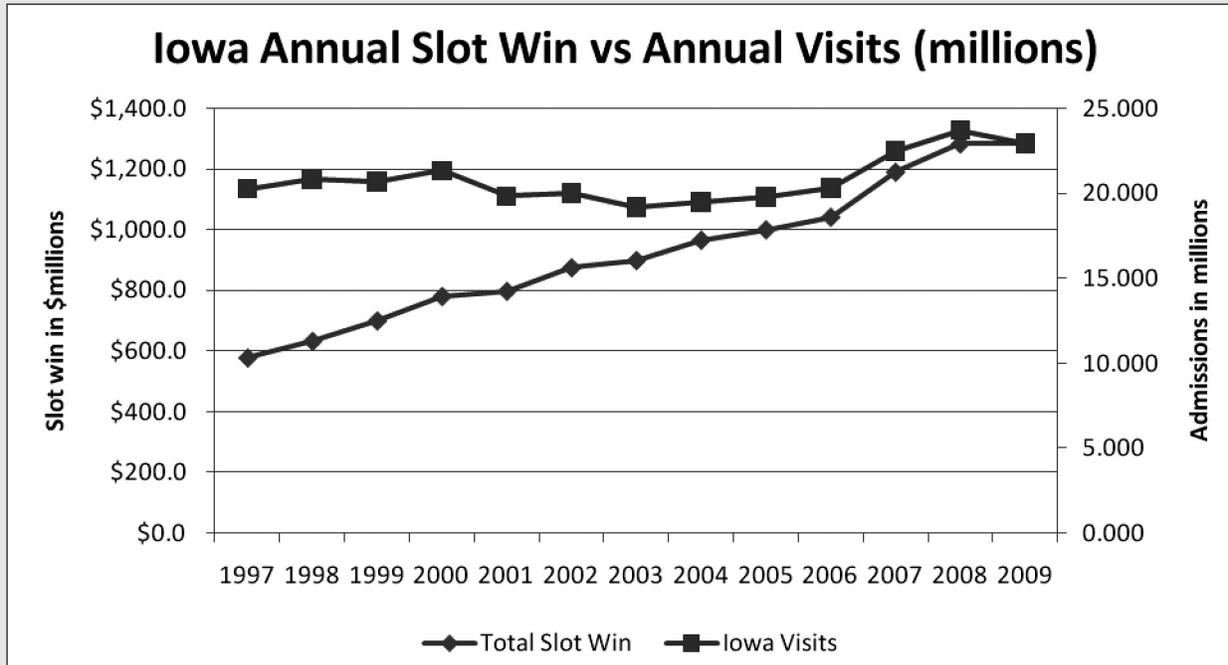
	1992	1993	1994	1995	1996	1997	1998	1999	2000
Total Slot Win	\$1,021.8	\$1,078.6	\$1,428.5	\$1,391.5	\$1,442.4	\$1,486.2	\$1,719.4	\$1,928.4	\$2,107.7
Annual Percentage Change		5.6%	32.4%	-2.6%	3.7%	3.0%	15.7%	12.2%	9.3%
LV Visits**	21.887	23.523	28.214	29.002	29.636	30.465	30.605	33.809	35.850
Annual Percentage Change		7.5%	19.9%	2.8%	2.2%	2.8%	0.5%	10.5%	6.0%
Est. Average Slot Spend Per Visit (actual dollars)	\$46.69	\$45.85	\$50.63	\$47.98	\$48.67	\$48.78	\$56.18	\$57.04	\$58.79
Percentage Change in CPI*	3.0%	3.0%	2.6%	2.8%	3.0%	2.3%	1.6%	2.2%	3.4%
Inflation-adjusted Slot Spend Per Visit (in 2008 dollars)	\$66.99	\$64.43	\$69.82	\$64.82	\$64.29	\$63.32	\$72.02	\$71.87	\$72.08
Year-to-year Percentage Change		-3.8%	8.4%	-7.2%	-0.8%	-1.5%	13.7%	-0.2%	0.3%
Cumulative Average Annual Change			2.3%	-0.9%	-0.9%	-1.0%	1.5%	1.2%	1.1%
	2001	2002	2003	2004	2005	2006	2007	2008	2009
Total Slot Win	\$2,055.4	\$2,111.9	\$2,160.3	\$2,535.6	\$2,789.9	\$3,059.3	\$3,142.9	\$2,886.9	\$2,471.8
Annual Percentage Change-	2.5%	2.7%	2.3%	17.4%	10.0%	9.7%	2.7%	-8.1%	-14.4%
LV Visits	35.017	35.072	35.540	37.389	38.567	38.915	39.197	37.482	
Annual Percentage Change	-2.3%	0.2%	1.3%	5.2%	3.2%	0.9%	0.7%	-4.4%	
Est. Average Slot Spend Per Visit (actual dollars)	\$58.70	\$60.22	\$60.78	\$67.82	\$72.34	\$78.61	\$80.18	\$77.02	
Percentage Change in CPI*	2.8%	1.6%	2.3%	2.7%	3.4%	3.2%	2.8%	3.8%	-0.4%
Inflation-adjusted Slot Spend Per Visit (in 2008 dollars)	\$70.32	\$71.18	\$70.45	\$76.77	\$79.43	\$83.80	\$83.23	\$77.02	
Year-to-year Percentage Change-	2.4%	1.2%	-1.0%	9.0%	3.5%	5.5%	-0.7%	-7.5%	
Cumulative Average Annual Change	0.7%	0.8%	0.6%	1.3%	1.5%	1.8%	1.6%	1.0%	

**LVCVA: <http://www.lvcva.com/getfile/80/Historical%201970%20to%202008.pdf>

*U.S. Bureau of Labor Statistics: <ftp://ftp.bls.gov/pub/special.requests/cpi/cpi.txt>

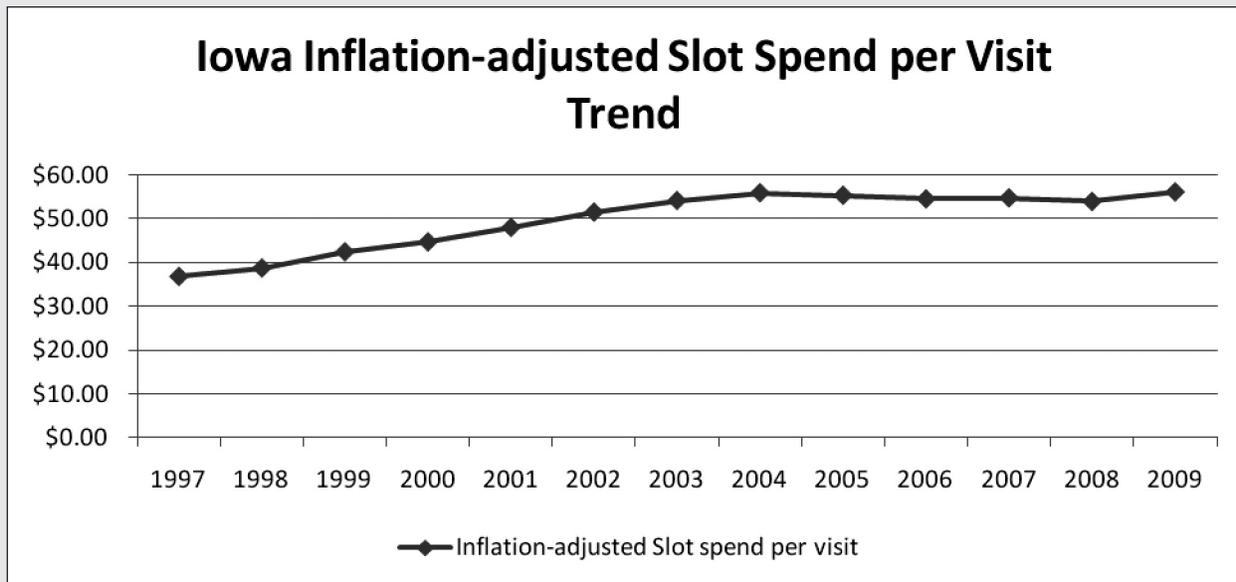
Iowa

Iowa slot revenue and admissions are comparable for the purpose of this analysis beginning in 1996. Results over 13 years are as follows.



Source: Iowa Racing and Gaming Commission.

The resulting estimated average annual spending increase after inflation is 3.6 percent.



Detailed year-to-year estimates for Iowa are as follows.

**IOWA
SLOT MACHINE WIN
1997 - 2009**

(In Millions, Except Per Visit)

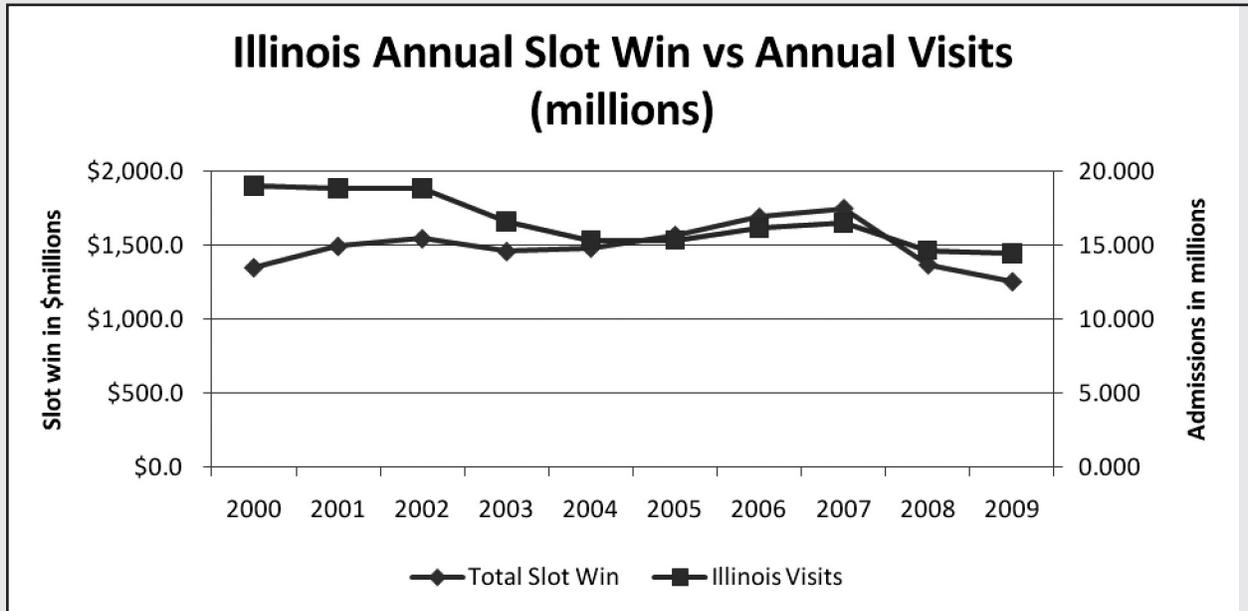
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Total Slot Win	\$577.4	\$632.0	\$699.5	\$780.5	\$797.6	\$875.3	\$899.1	\$966.5	\$1,000.6	\$1,042.3	\$1,191.0	\$1,284.3	\$1,286.9
Annual Percentage Change		9.5%	10.7%	11.6%	2.2%	9.7%	2.7%	7.5%	3.5%	4.2%	14.3%	7.8%	0.2%
Iowa Visits	20.272	20.841	20.695	21.335	19.836	20.029	19.186	19.509	19.793	20.315	22.513	23.735	22.956
Annual Percentage Change		2.8%	-0.7%	3.1%	-7.0%	1.0%	-4.2%	1.7%	1.5%	2.6%	10.8%	5.4%	-3.3%
Est. Average Slot Spend Per Visit (actual dollars)	\$28.48	\$30.33	\$33.80	\$36.58	\$40.21	\$43.70	\$46.86	\$49.54	\$50.55	\$51.31	\$52.90	\$54.11	\$56.06
Percentage Change in CPI*	2.3%	1.6%	2.2%	3.4%	2.8%	1.6%	2.3%	2.7%	3.4%	3.2%	2.8%	3.8%	-0.4%
Inflation-adjusted Slot Spend Per Visit (in 2008 dollars)	\$36.86	\$38.76	\$42.45	\$44.70	\$48.01	\$51.48	\$54.12	\$55.88	\$55.30	\$54.49	\$54.70	\$53.89	\$56.06
Year-to-year Percentage Change		5.2%	9.5%	5.3%	7.4%	7.2%	5.1%	3.2%	-1.0%	-1.5%	0.4%	-1.5%	4.0%
Cumulative Average Annual Change			7.3%	6.7%	6.8%	6.9%	6.6%	6.1%	5.2%	4.5%	4.1%	3.6%	3.6%

Iowa Racing and Gaming Commission: <http://www.iowa.gov/irgc/gamingpage2.htm>

*U.S. Bureau of Labor Statistics: <ftp://ftp.bls.gov/pub/special.requests/cpi/cpiat.txt>

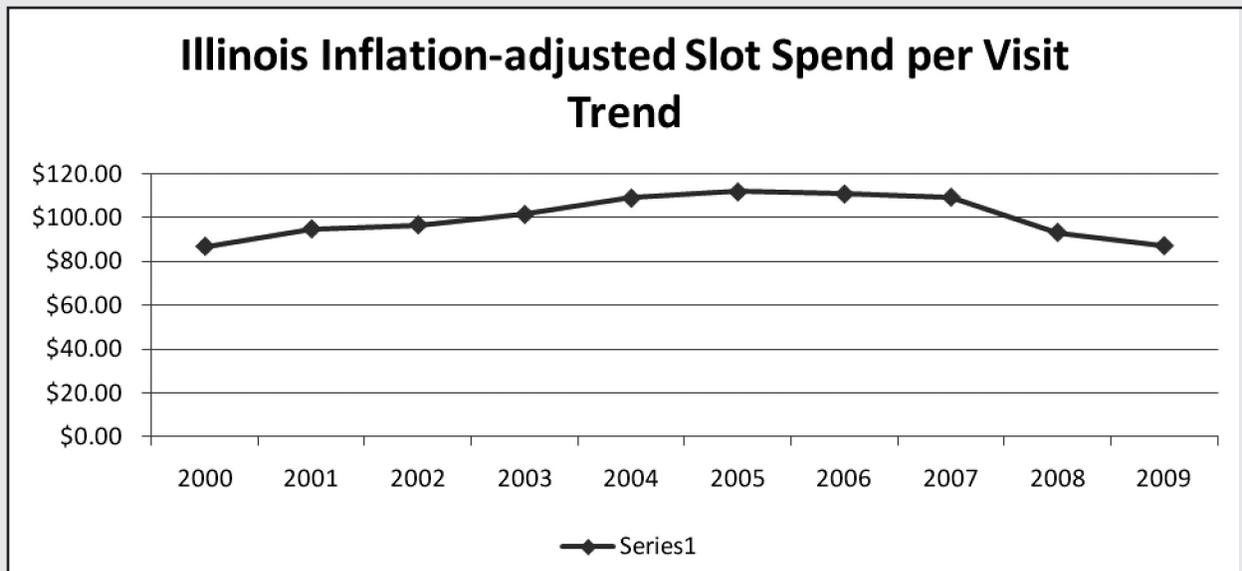
Illinois

Illinois slot revenue and admissions are comparable for the purpose of this analysis beginning in 2000. Results over nine years are as follows.



Source: Illinois Gaming Board.

The resulting estimated average annual spending increase after inflation is only 0.3 percent.



Detailed year-to-year estimates for Illinois are as follows.

**ILLINOIS
SLOT MACHINE WIN
2000 - 2009**

(In Millions, Except Per Visit)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Total Slot Win	\$1,349.2	\$1,492.9	\$1,544.6	\$1,458.0	\$1,481.8	\$1,567.5	\$1,690.2	\$1,749.4	\$1,369.1	\$1,254.0
Annual Percentage Change		10.7%	3.5%	-5.6%	1.6%	5.8%	7.8%	3.5%	-21.7%	-8.4%
Illinois Visits	19.015	18.808	18.822	16.598	15.331	15.323	16.180	16.525	14.637	14.419
Annual Percentage Change		-1.1%	0.1%	-11.8%	-7.6%	-0.1%	5.6%	2.1%	-11.4%	-1.5%
Est. Average Slot Spend Per Visit (actual dollars)	\$70.96	\$79.38	\$82.06	\$87.85	\$96.66	\$102.29	\$104.46	\$105.86	\$93.53	\$86.97
Percentage Change in CPI*	3.4%	2.8%	1.6%	2.3%	2.7%	3.4%	3.2%	2.8%	3.8%	-0.4%
Inflation-adjusted Slot Spend Per Visit (in 2008 dollars)	\$86.71	\$94.78	\$96.67	\$101.46	\$109.03	\$111.91	\$110.94	\$109.46	\$93.16	\$86.97
Year-to-year Percentage Change		9.3%	2.0%	5.0%	7.5%	2.6%	-0.9%	-1.3%	-14.9%	-6.6%
Cumulative Average Annual Change			5.7%	5.4%	5.9%	5.3%	4.2%	3.5%	1.2%	0.3%

Illinois Gaming Board: <http://www.igb.state.il.us/revreports/>

*U.S. Bureau of Labor Statistics: <ftp://ftp.bls.gov/pub/special.requests/cpi/cpiiai.txt>

1 U.S. Bureau of Labor Statistics: <ftp://ftp.bls.gov/pub/special.requests/cpi/cpiiai.txt>

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