



Casino Gambling in America and Its Economic Impacts

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Preface

CASINO GAMBLING has become a major industry in the United States over the past two decades. Nationwide, annual casino revenue tops \$40 billion. This report provides an analysis of casino gambling in the United States and discusses the economic issues surrounding casino gambling. The information contained in this report should prove useful to local officials and policy-makers who may be considering the adoption of casino gambling or who already have casino gambling in their jurisdictions.

The report begins by providing an overview of casino gambling in the United States. The size and location of all casino markets is discussed, along with a brief description of the major casino games available and how they work. The section also provides a look at the demographic characteristics of the typical casino gambler. This is an important issue, as casino gambling is often criticized for placing an unfair financial burden on the poor. This topic is discussed in detail.

The economic issues surrounding casino gambling are presented at length in section II of the report. The issues discussed include the employment effects of casino gambling, evaluating the societal benefits of casino tax revenue and the effect of casino gambling on local retail sales. Of the three, the employment effects of casino gambling receive the most attention by local policy-makers. As will be learned, the true impact of

casino gambling on employment depends upon labor force location, potential spillover effects and statewide business cycle changes.

Section III of the report provides a detailed look at the casino markets in states located in the Eighth Federal Reserve District. The location, size, employment, tax rates and revenue of each casino are presented.

Section IV of the report is an empirical analysis of county employment changes before and after casino adoption. Specifically, the analysis looks at the changes in both household and payroll employment in six Midwestern counties with casino gambling. Forecasting models are used to estimate potential differences in household employment as a result of casino gambling. An evaluation of payroll employment changes allows an evaluation of changes in a county's commercial base that may have occurred after casino gambling. The results of the analysis provide several interesting conclusions regarding the effect of casino gambling on employment.

Guidelines on evaluating the success or failure of casino gambling in a local community are presented in section V of the report. The discussion draws heavily from information presented in section II and outlines other potential costs and benefits of casino gambling. The section concludes by providing a sort of checklist of issues for local officials and the public to consider when evaluating the costs and benefits of casino gambling.

The final section of the report is reserved for a summary and conclusions.

I. An Overview of the Casino Industry

Casino gambling has become a major industry in the United States during the past two decades. Prior to the late 1980s, casino gambling was legal only in Nevada and Atlantic City, N.J. Today, casino gambling is available in 29 states. As a consequence, annual gambling revenue has grown from \$9 billion in 1991 to more than \$40 billion in 2001.¹ Americans spend more money in casinos than individually on golf, on-screen movies, CDs and sound equipment, and cable TV.² The casino industry consists of two major parties—Indian tribes and publicly traded private corporations, such as Harrah’s Entertainment and Trump Hotels and Casino. The Indian Gaming Regulatory Act (Public Law 100-497) passed in 1988 allows Indian tribes to own and operate casinos on their reservations. Tribal gambling is now available in 25 states and generates nearly \$13 billion in annual revenue. Corporate casino gambling is available in nine states and generated more than \$27 billion in revenue in 2001.³ Table 1 provides a listing of states where casino gambling is available.

While tribal gambling is available in more states, corporate casino gambling has traditionally been perceived as a more appropriate tool for fostering general economic development through increased employment and tax revenues.⁴ The primary reason for this is that states have no power to tax Indian casino revenue because Indian casinos are sovereign entities from the state.⁵ While states and Indian tribes do cooperate in regulation and security issues (dictated by state-tribal gambling compacts), the relationship between a tribe and a state is very similar to the relationship between two states: One state generally cannot legally dictate what another state can do. Corporate casinos, however, are private industries that are taxed and regulated by a state. These casinos generate much more revenue and hire more labor from the general labor market than Indian casinos do. As a result, many of the economic issues surrounding private casinos—such as tax revenue, employment and economic development—are of concern to policy-makers, economists and the public. Therefore, this report will focus on corporate casinos.⁶

Growth of Casino Gambling

Nevada was the first state to legalize casino gambling, in 1931, and has the largest gambling market in the country. The 210 casinos in Nevada generated more than \$9.5 billion in revenue during 2001. The largest concentration of casinos is in Las Vegas, with casinos in downtown (14 casinos) and on the Strip (47 casinos)

TABLE 1 – STATE GAMBLING SUMMARY 2001

State	Land-Based Casinos	Riverboat Casinos	Indian Casinos
Arizona			X
California			X
Colorado			X
Connecticut			X
Florida			X
Idaho			X
Illinois		X	
Indiana		X	
Iowa		X	X
Kansas			X
Louisiana	X		X
Michigan	X		X
Minnesota			X
Mississippi		X	X
Missouri		X	
Montana			X
Nebraska			X
Nevada	X		X
New Jersey	X		
New Mexico			X
New York			X
North Carolina			X
North Dakota			X
Oklahoma			X
Oregon			X
South Dakota			X
Texas			X
Washington			X
Wisconsin			X
TOTAL	4	5	25

SOURCE: Bear Stearns 2002-2003 *North American Gaming Almanac*, Page 16. The above list does not include those states with casinos operating as part of a state lottery. A state not listed has no corporate or tribal casinos.

amassing nearly \$5.3 billion in revenue and attracting 35 million visitors annually to fill more than 100,000 hotel rooms. Hotels downtown and on the Strip have 75,000 electronic gambling devices (EGDs)—which are slot machines, video poker games and any other electronic game used for wagering—and 3,300 table games that take up 3.3 million square feet of casino floor space. Other major Nevada markets include Reno (\$1 billion in revenue), Laughlin (\$500 million in revenue) and Lake Tahoe (\$330 million in revenue).

In 1976, New Jersey became the second state to legalize casino gambling, but restricted the activity to Atlantic City. Today there are 13 casinos in Atlantic City generating nearly \$4.3 billion in annual revenue and 32 million visits, making Atlantic City the second largest casino

gambling market in the United States. The Atlantic City market is characterized as a day-trip destination, whereas Las Vegas is typically considered a vacation destination. Atlantic City casinos have 12,000 hotel rooms and offer 37,000 EGDs, more than 1,200 table games and nearly 1.3 million square feet of casino floor space.

The 1990s saw a marked increase in the number of states that legalized casino gambling. Riverboat casino gambling first began in Iowa and Illinois in 1991 and quickly spread throughout the Midwest.⁷ Riverboat gambling now also exists in Indiana, Mississippi and Missouri. Louisiana and Michigan legalized land-based casino gambling within the last decade. Many of these riverboat and land-based casinos also have hotels. The primary reason that many states have approved corporate casino gambling is that it is seen as a potential tool for economic growth. The greatest perceived benefits are increased employment, greater tax revenue to state and local governments, and growth in local retail sales. Increasing fiscal pressures on state budgets during the 1990-1991 recession, the fear of lost revenue to neighboring states' casinos and a more favorable public attitude regarding casino gambling have all increased the appeal and acceptance of casinos.

The current state budget crises have prompted state legislators to take a renewed interest in casino gambling. Casino revenues are quite sizeable (Table 2), making them an attractive revenue source. Many states are considering the expansion of casino gambling while others, such as Pennsylvania, are debating whether to introduce slot machines at pari-mutuel racetracks. Several states with casino gambling have increased casino gambling tax rates within the past year or two. Also, states with Indian gambling are considering measures to extract casino revenue from traditionally tax-exempt Indian casinos. However, the direct taxation of tribal gambling revenue is likely to be met with serious legal challenges involving the sovereignty of Indian reservations.

The casino markets in the states shown in Table 2 vary in terms of revenue and the number of available casinos. Illinois has 10 riverboat casinos that attracted 18 million visits and generated nearly \$1.8 billion in revenue during 2001. The casino markets in Illinois include East St. Louis, Peoria and Chicago. The Indiana casino market is similar to Illinois, consisting of 10 riverboats that generate \$1.8 billion in annual revenue. The first riverboat casino opened in 1995. Annual admissions approach 41 million. Indiana's casinos are located in Evansville, southeast Indiana and northwest Indiana. Iowa has 10 casinos and three slot parlors (located at pari-mutuel tracks) making more than \$900 million in revenue and attracting 19 million visits. The primary

TABLE 2 – GAMBLING REVENUE – SELECTED STATES

State	2001 Revenue (\$ millions)	2000 Revenue (\$ millions)	Percent Change
Colorado	\$675.3	\$631.7	6.9%
Connecticut	1,401.6	1,308.7	7.1
Illinois	1,783.8	1,657.8	7.6
Indiana	1,841.8	1,689.7	9.0
Iowa	922.9	892.6	3.4
Louisiana	1,883.2	1,708.9	10.2
Michigan	1,007.4	742.9	35.6
Mississippi	2,700.8	2,650.4	1.9
Missouri	1,137.1	996.6	14.1
Nevada	9,466.9	9,599.4	-1.4
New Jersey	4,303.9	4,299.6	0.1
TOTAL	27,124.7	26,178.4	3.6

NOTE: Tribal and corporate casino revenue are considered in the above figures, which represent revenues to the casinos net of player winnings.

SOURCE: Bear Stearns *North American Gaming Almanac* 2002-2003, Page 6.

Iowa markets are Council Bluffs, Quad Cities, Dubuque/Marquette, Des Moines and Sioux City. The first Missouri riverboat casino opened in 1994. There are now 11 riverboat casinos in Missouri, with five in Kansas City and three in St. Louis. Missouri casinos generated revenue of \$1.1 billion in 2001 and offered 15,000 EGDs and 470 table games. Missouri casinos generate more than 51 million visits annually.

Mississippi has the largest casino market in the central United States and ranks third in the United States behind Nevada and Atlantic City. The first casino opened in Mississippi in 1992. There are now 29 casinos in Mississippi, with primary markets in Tunica, Vicksburg and along the Gulf Coast. Gambling revenue totaled \$2.7 billion in 2001. This is roughly half of Atlantic City's revenue. On average, Mississippi riverboat casino hotels are larger than most other casino hotels in the central United States. Several casinos have more than 1,500 hotel rooms. Mississippi casinos in Tunica and along the Gulf Coast, while always catering to the day-tripper, are following the Las Vegas model by becoming vacation destinations.

Louisiana and Michigan are the only two states besides Nevada and New Jersey that have legalized land-based casinos. Louisiana has 15 riverboat casinos and one land-based casino that generated \$1.9 billion in revenue during 2001 and attracted nearly 38 million visits. Major markets in Louisiana are New Orleans, Baton Rouge, Shreveport and Lake Charles. Michigan has three land-based casinos in the Detroit area, with the first casino opening in 1999. Revenue for these casinos totaled \$1 billion in 2001.

Who Are Casino Gamblers?

Given that casino gambling is a major industry in the United States, it is interesting to know who is doing the gambling. In other words, what are the characteristics of typical casino gamblers? Are they rich or poor, male or female, young or old? Understanding the demographic characteristics of casino patrons is not only valuable to casinos in terms of effective marketing, but also to local government officials and the public when deciding whether or not to allow casino gambling in their community. While there are various surveys of casino gamblers available, the most complete and recent is Harrah's 2002 survey titled "Profile of the American Casino Gambler." This survey was conducted independently by Roper ASW and NFO WorldGroup Inc., two nationwide survey research companies. This is a national survey, and the conclusions may certainly differ from surveys taken in specific geographical areas.⁸ However, the basic findings from the Harrah's survey are discussed here to provide insight into the average characteristics of the casino gambler.

An estimated 53 million people in the United States participate in casino gambling. This is equal to 27 percent of the population aged 21 or older. The median age of casino gamblers is 46, compared with a median age of 45 for the U.S. population. However, gambling is most popular among adults aged 51 to 60. The male/female ratio for casino gambling is 45/55, compared with 48/52 for the general population. Forty-six percent of gamblers graduated or attended college, compared with 43 percent of the general population. The five states generating the most casino trips are California, Illinois, Nevada, New York and Michigan.

One controversial issue surrounding casinos is the perception that the bulk of casino revenue comes from low-income gamblers, thus placing an unfair financial burden on the poor. There are really two separate issues: (1) Do lower-income gamblers bear more of the financial burden from casino gambling (i.e., as a percent of their income) and (2) From which income groups do casinos generate the bulk of their revenue? Focusing on the second issue, the median household income for casino gamblers is almost \$50,000, compared with \$41,000 for the U.S. population. This statistic reveals that the income *level* of casino gamblers is relatively higher than the U.S. population. Regarding the first issue, what is important is not the casino player's level of income, but rather the *percentage* of income wagered by gamblers having different incomes. For example, consider two gamblers, A and B, having annual incomes of \$20,000 and \$100,000, respectively. If both players lose \$1,000 per year, then A spends 5 percent of his

TABLE 3 – CASINO GAMES PLAYED

SLOTS/VIDEO POKER	74%
\$0.01 - 0.02	1%
\$0.05 - 0.10	16%
\$0.25 - 0.50	46%
\$1.00 - 2.00	10%
\$5.00 +	1%
TABLE GAMES	14%
Blackjack	9%
Roulette	2%
Craps	2%
OTHER	4%
DON'T KNOW	8%

SOURCE: "Profile of the American Casino Gambler," *Harrah's Survey 2002*

income on gambling, whereas B spends 1 percent. In this case, player A bears a larger financial burden than player B.⁹

The evidence on the financial burden of gambling is mixed. One early study using a national survey found high-income gamblers spend a greater percentage of their income on gambling than do lower-income gamblers—thus, high-income gamblers bear a greater financial burden than lower-income gamblers.¹⁰ A study of Las Vegas gamblers, however, found that lower-income gamblers living in Las Vegas spend a higher percentage of their income on gambling than wealthier gamblers living in Las Vegas. For visitors to Las Vegas, the burden on lower-income gamblers was somewhat less.¹¹

To determine which income group contributes the most to casino revenue, one needs to look at the income level of each player. That the median income of the casino gambler is higher than the U.S. median income suggests that, on average, casinos generate more of their revenue from relatively wealthier gamblers than they do from lower-income gamblers. However, it still may be true that lower-income gamblers bear a greater financial burden from casino gambling than do higher-income gamblers. While the evidence is relatively clear that the average casino patron is not lower income, the financial burden of casino gambling undoubtedly differs by location and should be analyzed on a case-by-case basis.

The Games People Play

Nearly 75 percent of casino visitors play EGDs, while 25 percent of visitors play table or other games. A listing of the casino games played most often is provided in Table 3.

Given differences in game preferences, it is not surprising that casinos allocate the vast majority of their floor space (about 80 percent) to slot machines and other EGDs. Denominations on slot machines range from 5 cents to \$1,000 per play, with the option of inserting multiple coins per play. Slot machines with denominations greater than \$100 per play are typically located only in Las Vegas and Atlantic City. Nearly half of all slot players favor 25-cent and 50-cent slot machines. Some slot machines offer progressive jackpots—meaning the jackpot is increased each play until someone hits the winning combination of symbols. In most cases, numerous slot machines are linked together for the progressive jackpot. The most popular progressive slot system is MegaBucks, which routinely posts jackpots averaging \$5 million to \$10 million.

The minimum slot machine payout required by state law averages around 85 percent. However, for competitive reasons, most casinos have slot machines that pay back at a higher rate, such as 95 percent or 98 percent. A payback rate of 95 percent means the house advantage is 5 percent. This does not mean that each player will have 95 percent of his wagers returned, but rather *over the long term* the slot machine will return 95 percent of the money wagered back to players in the form of winnings.

Today, slot machine payouts are dictated by a computerized random number generator.¹² Basically, every combination of possible reel outcomes on the slot machine has certain numbers associated with it. After a wager is made, the slot machine internally picks a combination of random numbers. The reels then spin and land on a particular combination of symbols that have been preassigned to the combination of random numbers. Clearly, higher-paying symbols are mapped to fewer random numbers than lower-paying symbols. (If not, the odds of winning any prize would be the same.) The machine then pays out if the certain combination of random numbers corresponds to those preassigned for the jackpot or smaller prizes. The symbols on each reel are irrelevant—they are simply for show; the outcome is determined at the time each bet is made, not after the reels stop spinning. Contrary to popular belief, there is no such thing as a “hot machine” or a “cold machine.” Slot machines have no memory—each spin on a slot machine is completely independent of past outcomes; so, the odds of hitting a jackpot are the same regardless of whether a jackpot was won on the previous play or two years ago.

Table games provide a different gambling experience from that of EGDs. While EGDs are relatively non-interactive, table games require some level of skill or

knowledge about the game and allow the player to actively participate, whether it be rolling dice in craps or holding cards in blackjack or poker. Usually the minimum bet for most table games is \$5, although \$3 tables are sometimes available. The house advantage on table games averages about 3 percent, but blackjack and craps have a house advantage averaging around 1 percent. Blackjack is the most popular table game, followed by roulette and craps. Baccarat is a table game that traditionally has had its greatest popularity with high-income players, but it is finding favor with low-end gamblers. New table games are continuously created and adopted by casinos across the country. Examples of relatively newer games available in most casinos are Caribbean Stud Poker, Let It Ride, Double Down Stud, Pai Gow Poker, Boston 5 and Three Card Poker.¹³ Several of these table games also allow the player to make a side wager of \$1 in order to win a progressive jackpot for a top hand, such as a straight flush or a royal flush.

Compliments to You

In an attempt to attract new players and keep existing patrons gambling longer, many casinos offer complimentary goods and services, or “comps” as they are commonly called. Comps can include items such as buffets, T-shirts and caps for low-end players, up to hotel rooms, dinners and transportation for higher-end players. There is also a type of gambler whom the casino industry refers to as a “whale.” Whales generally wager \$50,000 or more per hand and can easily wager \$10 million in a single weekend. In fact, big wins by whales can affect a casino’s quarterly financial statement. Las Vegas and Atlantic City casinos will do whatever they can to attract these players, which only number a few hundred in the world. Whales do not pay for any part of their trip; they receive a penthouse hotel room at no charge (which could rent out at \$10,000 or more per night) and will be provided anything (almost literally) that they request free of charge. On average, casinos spend 21 percent of their adjusted gross revenue in comps (compared with an average of 18 percent on payroll), thus highlighting the importance of comps in generating additional casino revenue.¹⁴

Casino comps are generally computed in the following manner: The player’s average bet is multiplied by hours played, the number of pulls or hands dealt per hour and the casino advantage for that game. The final number is the player’s theoretical loss. So, for example, if you play a slot machine with a house advantage of 5 percent (95 percent payout rate) for two hours at \$3 per play and 120 plays per hour, your comp will be \$36 ($2 \cdot 3 \cdot 120 \cdot 0.05$). Sometimes casinos base actual

comps paid on about 30 percent to 50 percent of the computed comp. Since slot odds are more in favor of the house, a slot player will probably get slightly more comp per dollar wagered than a table game player.

There are several things a player can do to increase his comps. If playing a slot machine or video poker, it is a good idea to get a club card. A club card looks like a credit card and is issued by the casino for use in that casino only. This card is simply inserted into a machine and will accumulate points based on how much is wagered and for how long the patron plays. One could still receive comps without a club card, but this would require playing for extensive time periods and/or for large denominations (probably \$5 or over) in order to attract the attention of the slot manager or slot host. However, points will not accumulate without a card. Depending on the level of play, patrons may not receive any comps while in the casino, but may receive coupons for free meals, gifts, etc. in the mail several days after visiting the casino (which often must be redeemed at the casino, thus requiring a return trip). Other times, a slot host may visit the player while he is still on the casino floor.

If playing a table game, a patron can increase his comps by betting more when the pit boss (table game manager) is observing the game. The pit boss floats

from table to table, casually (but accurately) keeping track of how much each player is wagering. Also, a player can ask the pit boss to record the amount of his buy-in (trading cash for chips) and also let the pit boss know when he changes tables. It is beneficial to play at a table with as many players as possible and then bet more when the pit boss is watching. With more players, the number of hands dealt per hour is less, meaning the player's loss per hour is less.

Report Outline

This section has provided an overview of the casino industry in the United States. The next section of the report discusses major issues surrounding casinos. Issues include employment effects, tax revenue and retail sales growth. Section III provides a detailed look at the casinos in and around the Eighth Federal Reserve District. Casino location, employment, legal aspects and other issues will be discussed. Section IV consists of an empirical examination of the employment effects of casino gambling. Section V discusses some criteria that should be used when determining whether or not a casino has been a success or failure. As will be discovered, the success or failure of a casino can be subjective. The final section is reserved for a summary and conclusions.

II. Casinos—A Look at the Economic Issues

Economic development is used by the casino industry, state and local government, and casino proponents to persuade the citizenry to allow casino gambling. The perceived benefits of casinos are increased employment, higher tax revenue and retail sales growth. This section provides a general evaluation of each perceived benefit. Both citizens and government officials should understand the topics when they debate the issues surrounding casinos and economic development.¹⁵

Casinos and Local Employment

One issue regarding casinos and employment involves the location and required skill level of a casino's labor force. The basic idea regarding increased employment is that a casino's operation requires labor, and this labor will come from the local area. This, in turn, will reduce local unemployment. The question to ask is not just whether casinos decrease unemployment, but for whom they decrease unemployment. Most casino jobs require some kind of skill, be it accounting, dealing cards, security or other expertise. If a casino is planning to move to a rural area having a relatively less-skilled workforce, the casino probably will draw skilled labor from outside of the area. If this labor remains outside of the local area and workers commute to the casinos, then unemployment in the local area will remain unchanged. If some of this skilled labor decides to move near the casino, then the unemployment rate (which is the number unemployed divided by the labor force) in the local area will fall because the labor force has increased. It is this decreased unemployment rate that is often used as evidence that casinos have indeed improved local employment. However, it is important to realize that unemployment for the original, less-skilled population has remained essentially unchanged—only the higher-skilled, new arrivals have found employment with the casino. It is the employment of these new arrivals that has decreased the unemployment rate.

While casino employment is usually a measure of economic development, it is important to realize that economic development occurs when there is increased value to society. For example, the introduction of casino gambling may cause local businesses to close, which will result in layoffs.¹⁶ The net increase in employment to the local area is thus less than the number of new casino jobs. It is possible that casino gambling may increase total employment or decrease total employment in an area through the impact of casinos on local

businesses. The degree to which casinos may affect local business is discussed later in this section.

The main lesson regarding casinos and their impact on the local unemployment rate for the original population is that local officials and the citizenry need to know whether the workforce for the new casino will come from their area. The promise of increased employment for the original population that is often used as an argument for the construction of casinos may not be realized. In a relatively urban area, there is probably enough variety in the workforce to ensure that skilled labor will be provided locally. In rural areas, however, most labor may be from outside of the area, thus leaving unemployment for the original population unchanged.

A final issue surrounding casinos and employment is "employment spillover." This occurs when casinos indirectly generate non-casino jobs in the local area as a result of increased demand for non-casino goods and services. Casino employees who were previously unemployed or who recently moved into the area now generate income, and this income will be spent on goods and services, such as housing and entertainment. An increase in demand for these services will increase firms' demand for labor, thereby increasing employment. Employment spillovers essentially result in a multiplier effect. The degree of this multiplier effect has been disputed in the literature, but the general consensus is that a multiplier effect indeed exists.¹⁷

Casino Tax Revenue

Most states tax adjusted casino revenue and use the taxes to fund state and local programs. There is wide variation in the casino revenue tax rates across the country. A sampling of casino tax rates is shown in Table 4.

Casino proponents and state and local governments promote casino tax revenue as a benefit. This revenue is a benefit for the recipients of taxed casino revenue. However, it is important to realize that this revenue is not new money to society. Taxes result in a transfer of income from one group to another group—in this case, casino owner to state and local governments (and eventually to program recipients). So while states collect hundreds of millions of dollars annually in casino taxes, these tax revenues are a cost to casino operators. The transfer of revenues from casino operators to state governments does not result in new societal wealth or economic activity. Therefore, tax revenue cannot be counted as a benefit to society.

Another issue surrounding casino tax revenue is that all tax revenue is interchangeable from a budgeting and

TABLE 4 – SELECTED STATE CASINO REVENUE TAX RATES

State	State Casino Revenue Tax Rates
Illinois	<ul style="list-style-type: none"> • 15% on first \$25 million of gambling revenue • 22.5% on next \$25 million - \$50 million of gambling revenue • 27.5% on next \$50 million - \$75 million of gambling revenue • 32.5% on next \$75 million - \$100 million of gambling revenue • 37.5% on next \$100 million - \$150 million of gambling revenue • 45% on next \$150 million - \$200 million of gambling revenue • 50% on gambling revenue in excess of \$200 million
Indiana	<ul style="list-style-type: none"> • 15% on \$25 million of gambling revenue • 20% on next \$25 million - \$50 million of gambling revenue • 25% on next \$50 million - \$75 million of gambling revenue • 30% on next \$75 million - \$150 million of gambling revenue • 35% on gambling revenue in excess of \$150 million
Iowa	<ul style="list-style-type: none"> • 5% on first \$1 million of gambling revenue • 10% on next \$1 million - \$3 million of gambling revenue • 32% on all gambling revenue over \$3 million (increasing each year up to 36% maximum)
Missouri	<ul style="list-style-type: none"> • 20% on all gambling revenue (2% for local governments)
New Jersey	<ul style="list-style-type: none"> • 8% tax on all gambling revenue • 1.25% tax paid quarterly to Casino Reinvestment and Development Authority
Nevada	<ul style="list-style-type: none"> • Paid monthly • 3% on first \$50,000 of gross revenue • 4% on next \$84,000 of gross revenue • 6.25% on gross revenue over \$134,000

SOURCE: Each state's gambling commission and Bear Stearns 2002-2003 *North American Gaming Almanac*, various pages.

spending perspective. States often promote how much casino tax revenue is earmarked for certain social programs. Public education tends to be a favored destination in many states. This suggests to the public that spending on these social programs, education for example, has increased since the taxing of casino revenue began. This may not be the case. The problem is that all earmarked revenue is interchangeable. Consider the following example: Your son is in college and spends \$40 a week on pizza. You send him a check for \$20 and insist that he spend the money on pizza. This suggests that his total spending on pizza will now be \$60 a week. But there is nothing preventing your son from taking \$20 out of his original \$40 and using it for something else, and then simply adding your \$20 back to get the final \$40.

The same works for government regardless of the tax and destination of revenue. If \$100 million per year in casino taxes is earmarked to education, one might expect total education spending to increase by \$100 million. However, state legislators can simply reduce the total amount of funds budgeted for education by \$100 million and use these funds elsewhere, and then use the \$100 million from casino revenue to bring total education expenditures back to their pre-casino levels. No increase in education spending has occurred.

The swapping of casino revenue has yet to be tested empirically, but the issue has been explored using state lotteries. Numerous studies have found that in those states that earmark lottery funds for education, spending on education has not increased beyond historical trend levels after the introduction of the lottery.¹⁸ Contrary to the claim made by lottery officials and lottery proponents, state lotteries do not appear to help public education. There is no reason to doubt the same result may occur with casino revenue.

Casinos and Local Retail Sales

The issue of whether casinos help or hurt local retail sales, and thus retail sales tax collections, has received the most attention in the academic literature. Essentially, the casino's impact on local retail sales (and retail sales tax collections) is determined by consumption preferences of local citizens and the degree to which casinos attract visitors from outside the local area. There are three possibilities.¹⁹ First, casino gambling can serve as part of an overall tourist industry. Under this scenario, casinos attract non-local players who inject new money into the economy via the casino and other entertainment activities. A second possibility is that gambling can function as an import substitution activity that serves only local customers who, without the casino, would have spent their income outside of the local area. That is, the casino keeps local income local. Finally, the third possibility is that a casino functions as a local service only, just like any other business, and simply results in a redistribution of income from one business to another as local consumers choose where to spend their income. Note this third possibility applies to any business wishing to open in an area—say, Wal-Mart, Home Depot or others. Local retailers often oppose the opening of these superstores in fear of losing sales.²⁰

Research on this issue is somewhat mixed. One study of Missouri casinos found that an increase in casino revenue decreases retail sales in the rest of the entertainment and amusement industry (theaters, sports clubs, gyms) for those counties having casinos. In this

case, casino gambling is a substitute for certain business activities—local spending is transferred to casinos from other businesses.²¹ A similar result was obtained in a study of Arizona casinos.²² The authors found that the growth in retail sales tax collections from various industries slowed after the introduction of casino gambling. Another study found that casino gambling in Indiana results in import substitution—casinos attract local patrons who would have, without the casino, spent their money outside of the local area.²³

These studies suggest that casino gambling on retail sales should be evaluated on a case-by-case basis. However, casinos located in larger cities that offer relatively more amenities than rural areas will tend to attract casino patrons from outside the area more so than rural casinos will.

It should be noted that casinos, just like any new business to an area, result in a reallocation of consumer dollars. Casino patrons will likely take their dollars away from certain activities (restaurants, movies) and move them into casino gambling. Entertainment merchants find this bad, but from an economic viewpoint society is better off. This is simply because consumers are spending their income on the activity they value the most—casino gambling. The income received by casino operators is a reflection of this value. It is unfortunate when certain retailers must shut down because of casino gambling (or any other competition for that matter), but this is a result in a capitalist economy where consumers are free to choose where they spend their dollars. Resources are constantly reallocated to activities that consumers value most.

III. Casinos in the Federal Reserve System's Eighth District

This section provides casino statistics in the states within the Eighth Federal Reserve District.²⁴ The states with casinos are Missouri, Illinois, Indiana and Mississippi.

Summary statistics for each state are shown in Table 5.

Missouri

The first riverboat casino opened in Missouri in May 1994. There are 11 casinos operating in Missouri—five in Kansas City, three in St. Louis and one casino each in Boonville, Caruthersville and LaGrange. Missouri casinos employ nearly 11,000 people and generate 51 million visits annually. These casinos amassed more than \$1.2 billion in casino revenue and provided state and local governments in Missouri with more than \$300 million in casino taxes and admission fees in fiscal year 2002. The casino revenue tax rate is 20 percent of monthly revenue, of which 2 percent is allocated to the city or county in which the casino is located. Missouri also imposes a \$2 admission fee on each patron entering a casino. Casino revenue in Missouri has grown at an average annual rate of 16 percent since 1996.

Nearly 15,500 EGDs and 470 table games fill 540,000 square feet of casino floor space in Missouri. Unlike many states, Missouri law subjects patrons to a \$500 loss limit for each two-hour gambling session. Each casino in Missouri pays an annual \$25,000 license fee, renewable every two years. Missouri has no limits or moratoriums on the number of licenses or casino locations.

Kansas City

There are five casinos in the Kansas City market area—Argosy, Frontier, Isle of Capri, Harrah's and Ameristar. These casinos generate more than \$600 million in revenue, attract more than 25 million annual visits and employ 5,700 people. Harrah's and Ameristar are the largest casinos, both in size and revenue generated. Each of the two casinos has nearly \$200 million in annual revenue, and they average 100,000 square feet of casino floor space. In terms of revenue market share, Harrah's and Ameristar account for 64 percent of the Kansas City market. Revenue market share for each of the other casinos is as follows: Argosy, 16 percent; Isle of Capri, 15 percent; and Frontier, 5 percent. The Kansas City casinos face competition from several Indian casinos in northeast Kansas and Council Bluffs, Iowa.

St. Louis

St. Louis has three casinos. The President is located in downtown St. Louis, and Harrah's and Ameristar are

TABLE 5 – CASINO STATISTICS

	Mississippi	Missouri	Illinois	Indiana
Total Revenue (\$ millions)	\$2,688.9	\$1,212.1	\$1,831.6	\$1,841.8
Casino				
Employment	34,541	10,685	11,333	15,954
Number of Casinos	29	11	9	10
Number of				
Slot Machines	39,491	16,119	9,449	16,661
Revenue Per				
Slot Per Day	\$150	\$176	\$442	\$248
Number of				
Table Games	1,138	437	278	646
Revenue Per				
Table Per Day	\$1,120	\$943	\$2,662	\$1,418
Casino Square				
Footage	1,579,833	526,900	269,916	496,490

Mississippi: Revenue data are from 2001. All other data as of March 1, 2003.

Missouri: All data are from fiscal year 2002 except per day estimates, which are 2001.

Illinois: Data are from November and December 2002 except revenue per slot/table is from 2001.

Indiana: Data are from 2001.

located in St. Louis and St. Charles counties, respectively. There are also two casinos on the Illinois side of the Mississippi within the St. Louis MSA. In total, these five casinos generate more revenue (\$760 million) than the five Kansas City area casinos. The three St. Louis casinos generate nearly \$500 million in revenue and contribute \$100 million in tax revenue to state and local governments. The President opened in May 1994, while Harrah's and Ameristar (formerly Station Casino) opened in March 1997. Total employment at these casinos is 4,200. Harrah's is the largest casino, with nearly 120,000 square feet of casino floor space, 300 hotel rooms, 3,200 EGDs and 74 table games. As in most casino markets, EGDs provide the greatest percentage of casino revenue to St. Louis casinos. Eighty-seven percent of St. Louis casino revenue (\$430 million) came from EGDs in 2001.

Rural Casinos

In addition to casinos in Kansas City and St. Louis, there are three casinos located in rural areas throughout the state. These casinos are smaller both in size and revenue generated than the average urban casino. Casino Aztar is located in Caruthersville and opened in 1995. It generates roughly \$25 million in annual revenue, employs 350 people and has 350 EGDs and 15 table games. Visits to Casino Aztar approached 800,000 in

2001. The Isle of Capri Casino in Boonville opened in December 2001. Total estimated revenue from the Isle of Capri for 2002 approached \$60 million, and the casino employs nearly 725 people. Isle of Capri has 28,000 square feet of casino floor space, 900 EGDs and 30 table games. The Mark Twain Casino is located in LaGrange and began operations in July 2001. This casino employs 300 people, has 18,000 square feet of casino floor space and provides 450 EGDs and 14 table games.

Illinois

Illinois has nine riverboat casinos, with four casinos located in the Chicago area, two in the East St. Louis/Alton area, and one casino each in Peoria, Metropolis and Rock Island. Illinois has both cruising and dock-side casino gambling. Illinois casinos generated \$1.8 billion in revenue in 2002, about \$600 million more than Missouri casinos. Similar to Missouri, casino revenue in Illinois has grown at an average annual rate of 16 percent since 1994. Unlike Missouri, Illinois has a graduated casino tax schedule, similar to the federal income tax. The first \$25 million in casino revenue is taxed at a marginal rate of 15 percent, with the marginal tax rate increasing up to 50 percent on revenue in excess of \$200 million. Local governments receive gambling taxes equal to 5 percent of revenue. Total casino tax revenue in 2002 was more than \$650 million. There is also a \$3 per-passenger admission tax, of which \$1 goes to the city or county in which the casino is located. Illinois gambling licenses are initially valid for three years and are renewable for up to four years, or as determined by the Illinois Gaming Control Board.

While Illinois casinos generate more revenue than Missouri casinos, there are fewer EGDs and table games in Illinois. There are about 9,600 EGDs and 290 table games in Illinois casinos, compared with 15,500 and 470 in Missouri. As a result, casino revenue per machine or per table is higher in Illinois than in Missouri. An explanation for this may be that, unlike Missouri, Illinois does not have wagering limits and Illinois casino licenses require that each casino have no more than 1,200 positions (EGDs + seats at table games).

Chicago

Illinois has four casinos in the Chicago area—Empress Casino and Harrah's in Joliet, Elgin Riverboat Resort in Elgin and the Hollywood Casino in Aurora. These four casinos dominate the Illinois market, generating more than \$1.2 billion in revenue, or nearly 67 percent of all casino revenue in the state. Harrah's generated the most revenue in 2002—more than \$315 million. Combined, these casinos contributed roughly

\$413 million in tax revenue to the state of Illinois and \$72 million to dock site communities.

The Chicago casinos are similar in size and employment. The Empress Casino in Joliet opened in 1992 and employs 1,700 people. With more than 36,000 square feet of casino floor space, this casino admitted 2.3 million persons (6,300 per day) during 2001. Harrah's, also in Joliet, opened in 1993. This casino also employs about 1,700 people and offers 39,000 square feet of casino floor space. Both Harrah's and the Empress Casino contributed \$33 million in casino taxes to the local Joliet area in 2001. The Hollywood Casino in Aurora employs 1,550 people and began operations in July 1993. Annual admissions are more than 2.7 million, and the Aurora area received nearly \$14 million in casino tax revenue. Elgin Riverboat Resort opened in 1994 and employs 1,767 people. With 29,850 square feet of casino floor space, the Elgin Riverboat Resort is the smallest of the four casinos. However, admissions topped 3.4 million in 2001, and the Elgin area receives more than \$24 million annually in casino tax revenue.

East St. Louis/Alton

Two casinos are located in the St. Louis MSA on the Illinois side of the Mississippi. The Alton Belle Casino is located in Alton. This casino opened in 1991, employs 970 people and has 23,000 square feet of casino floor space. Annual admissions top 2.6 million, and the Alton Belle generated \$272 million in revenue in 2002. This translates into almost \$8 million in casino tax revenue to the Alton area.

The Casino Queen is located in East St. Louis, roughly 10 miles from the Alton Belle. Opened in July 1993, the Casino Queen employs nearly 1,200 people and offers 27,500 square feet of casino floor space. With annual revenue surpassing \$157 million, the Casino Queen admitted 2 million visitors and contributed nearly \$10 million in tax revenue to the East St. Louis area.

Other Illinois Casinos

Illinois has three additional casinos outside of the St. Louis and Chicago areas.

The Par-A-Dice casino in East Peoria opened in February 1992. The riverboat cruises along the Illinois River and attracts nearly 2 million visits annually. With more than \$145 million in revenue, the Par-A-Dice casino contributed more than \$9 million in tax revenue to the East Peoria area. Employment at the Par-A-Dice casino is about 1,050, and the casino provides more than 26,000 square feet of casino floor space.

Harrah's is located in the southern Illinois city of Metropolis and cruises along the Ohio River. This casino employs 883 people and opened in 1993. With nearly 30,000 square feet of casino floor space, Harrah's attracted more than 1.5 million visits, generated nearly \$139 million in revenue and contributed \$8.5 million in casino tax revenue to the Metropolis area during 2002.

Casino Rock Island is the smallest casino in Illinois. It is located in Rock Island, across the Mississippi River from Davenport, Iowa. This casino opened in 1992 and employs 482 people. Casino Rock Island had more than 800,000 visits in 2002 and generated more than \$40 million in revenue. The Rock Island area received nearly \$3 million in casino tax revenue from the Casino Rock Island.

Indiana

Indiana has 10 riverboat casinos. Like Illinois, Indiana allows both cruising and dockside riverboat gambling. There are five casinos in northwest Indiana, outside of the Chicago suburbs. There are four casinos in southeast Indiana and there is one casino in Evansville, in southwest Indiana. Total employment at Indiana casinos is about 16,000. Annual gambling revenue in Indiana is similar to that of Illinois—about \$1.8 billion—with state and local governments receiving nearly \$500 million in casino tax revenue. Casino revenue has increased every year since the first casino opened in 1995, and annual visits top 41 million. In July 2002, Indiana switched from a flat gambling tax rate like Missouri's to a graduated tax schedule similar to that of Illinois. Marginal tax rates range from 15 percent on the first \$25 million of revenue up to 35 percent on revenue in excess of \$150 million. There is also a \$3 admission tax per patron that generated \$124 million in 2001. Indiana casinos provide 16,500 EGDs, 670 table games and more than 450,000 square feet of casino floor space. More than 41 million visitors were admitted to Indiana casinos in 2001. Casino licenses in Indiana may be renewed annually and require a \$5,000 renewal fee.

Chicago Area

Indiana has five casinos in the Chicago area. The Blue Chip Casino is located in Michigan City, and the Majestic Star Casino and Trump Casino are both located in Gary. The Horseshoe Casino calls Hammond its home, and Harrah's has a riverboat in East Chicago. The Chicago market is the largest market in Indiana, generating roughly \$920 million of the \$1.8 billion in casino revenue for 2001.

The Blue Chip Casino began operations in 1997. The casino offers 1,511 EGDs and 47 table games

within 37,000 square feet of casino floor space. Blue Chip employs 1,144 people, of whom 62 percent are from the home county. The casino generated more than \$185 million in revenue, of which \$37 million in tax revenue went to state and home governments.

The Majestic Star Casino and the Trump Casino are located in Gary, and both opened in June 1996. The Majestic Star has 43,000 square feet of casino floor space, 1,409 EGDs and 51 table games. Revenue for the Majestic Star topped \$122 million in 2001, of which \$24 million was paid in casino revenue taxes. The Majestic Star employs 1,333 people, of whom 84 percent are from the home county. The Trump Casino is very similar to the Majestic Star. This casino has 37,300 square feet of casino floor space and provides 1,455 EGDs and 50 table games. The Trump Casino amassed \$124 million in casino revenue and paid \$25 million in casino taxes during 2001.

The Horseshoe Casino began operation in 1996, and Harrah's opened in 1997. The Horseshoe offers 1,518 EGDs and 51 table games within 42,500 square feet of casino floor space. The casino employs 2,180 people, of whom 67 percent are from the home county. The Horseshoe generated \$262 million in gambling revenue during 2001. Harrah's employs 1,755 people and offers 2,004 EGDs and 65 table games on 49,210 square feet of casino floor space. Revenue in 2001 totaled \$266 million. Both casinos serve the greater Chicago area.

Southern Indiana

There are five casinos in southern Indiana along the Ohio River. Casino Aztar is located in Evansville and opened in 1995. This casino offers 1,345 EGDs and 54 table games within 38,360 square feet of casino floor space. Total employment at Casino Aztar is 1,051, with 71 percent of employees from the home county. Revenue for 2001 totaled \$93.4 million.

Caesar's casino is located in Elizabeth and is one of the larger riverboat casinos in Indiana. This casino has 93,000 square feet of casino floor space, 2,493 EGDs and 142 table games. Revenue for 2001 topped \$210 million. The casino opened in 1998 and employs 2,259 people, of whom 21 percent are from the home county.

Three riverboat casinos are located in the southeastern corner of Indiana. These are the Argosy casino in Lawrenceburg, Belterra Resort in Belterra and the Grand Victoria Casino in Rising Sun. The Argosy is the largest riverboat casino in southern Indiana. The casino amassed nearly \$240 million in revenue during 2001. It opened in 1996 and employs 2,333 people, of

TABLE 6 – CASINO STATISTICS – TUNICA, MISS.

Casino	Employment	Casino Square Footage	Number of Electronic Gaming Devices (EGDs)	Number of Tables	Date Opened
Bally's	749	46,535	1,305	42	12/18/1995
Fitzgerald's	954	36,000	1,349	34	6/6/1994
Gold Strike	1,288	50,486	1,395	47	8/29/1994
Grand Casino	2,444	117,920	2,522	93	6/24/1996
Harrah's	852	50,000	1,205	21	4/8/1996
Hollywood	1,100	54,000	1,623	33	8/8/1994
Horseshoe	2,544	63,000	2,090	72	2/13/1995
Isle of Capri	830	63,500	1,529	38	6/27/1994
Sam's Town	1,247	74,210	1,478	43	5/25/1994
Sheraton	864	32,800	1,372	37	8/1/1994
TOTAL	12,872	588,451	15,868	460	

NOTE: Data are from December 2002. The Isle of Capri is in Coahoma County, but is considered part of the Tunica market. EGDs consist of slot machines, video poker and any other electronic game. Several casinos have opened and closed during the 1990s. See the Mississippi Gaming Commission for a list of all casinos that have operated in Tunica throughout the 1990s.

whom 38 percent are from the home county. The casino has 78,000 square feet of casino floor space and offers 2,110 EGDs and 101 table games. Belterra Resort began operations in 2000 and employs 1,588 people. More than 1,300 EGDs and 45 table games are available at Belterra. Employment is nearly 1,600, with 45 percent from the home county. Total revenue in 2001 topped \$95 million. The Grand Victoria casino opened in 1996 and employs 1,077, of whom 27 percent are from the home county. The casino has 40,000 square feet of casino floor space and offers 1,472 EGDs and 40 table games. Revenue for 2001 totaled \$130 million.

Mississippi

Mississippi has the third largest casino market in the United States, behind Las Vegas and Atlantic City. The first casino opened in 1992. Mississippi casinos, like those in Missouri, are fixed in dock. There are now 29 casinos in Mississippi that generate nearly \$2.7 billion in annual revenue. Mississippi casinos have 40,612 EGDs, 1,157 table games and employ more than 34,000 people. There are five casino markets in Mississippi—Tunica/Coahoma County, the Gulf Region and the cities of Greenville, Natchez and Vicksburg. Mississippi places no limit on the number of casino licenses that can be granted, but gambling can be conducted only in counties that have approved gambling by local referendum. Casino licenses are initially issued for two years and then are renewable every eight years.

Casino tax rates in Mississippi are lower than in Missouri, Illinois and Indiana. Mississippi taxes the first \$50,000 of monthly gambling revenue at 4 percent, the next \$84,000 is taxed at 6 percent and all monthly revenue over \$134,000 is taxed at 8 percent. Local gov-

ernments tax monthly casino revenue using the same graduated tax schedule, but the tax rates are one-tenth of the state rates. Also, cities and counties with casinos levy an additional 3.2 percent tax on monthly gross gambling revenue. There is no admission fee to Mississippi casinos. Total casino tax revenue was nearly \$330 million in fiscal year 2002.

Tunica

The Tunica market has nine casinos in Tunica County and one casino in neighboring Coahoma County. In terms of revenue, Tunica is the largest market in Mississippi. Casinos in Tunica generate nearly \$1.2 billion in annual revenue. Tunica casinos have nearly 17,000 EGDs and 500 table games and employ more than 14,000 people. All of Tunica's casinos have hotel rooms, with several casinos each having more than 1,000 rooms. Descriptive statistics for each casino in the Tunica market are shown in Table 6.

Gulf Coast

There are 12 casinos in Mississippi's Gulf Coast area—one in Bay St. Louis, two in Gulfport and nine in Biloxi. Gulf Coast casinos generated \$1.15 billion in 2001, just slightly less than Tunica casinos. Of this \$1.15 billion, Biloxi casinos accounted for \$887 million (77 percent). The Gulf Coast casinos have more than 17,000 EGDs and 550 table games, and they employ nearly 17,000 people. Descriptive statistics for each Gulf Coast casino are shown in Table 7.

Other Mississippi Casino Markets

The three other casino markets in Mississippi are much smaller than the Tunica and Gulf Coast markets,

TABLE 7 – CASINO STATISTICS – MISSISSIPPI GULF COAST

Casino	Employment	Casino Square Footage	Number of Electronic Gaming Devices (EGDs)	Number of Tables	Date Opened
Beau Rivage	2,606	71,669	2,261	90	3/16/1999
Boomtown	909	33,632	1,157	22	7/18/1994
Casino Magic (Bay St. Louis)	1,172	39,500	1,097	37	9/30/1992
Casino Magic (Biloxi)	1,174	49,260	1,285	31	6/5/1993
Copa Casino	871	43,025	1,206	44	9/10/1993
Grand Casino (Biloxi)	2,235	134,200	2,809	87	1/17/1994
Grand Casino (Gulfport)	1,763	85,000	2,176	71	5/14/1993
Imperial Palace	501	70,000	1,623	31	12/29/1997
Isle of Capri	789	32,500	1,161	28	8/1/1992
President Casino	788	38,297	869	34	8/13/1992
The New Palace	900	43,500	983	37	2/2/1997
Treasure Bay	792	40,000	916	41	4/28/1994
TOTAL	14,443	680,583	17,543	553	

NOTE: Data are from December 2002. EGDs consist of slot machines, video poker and any other electronic game. Several casinos have opened and closed during the 1990s. See the Mississippi Gaming Commission for a list of all casinos that have operated in the Gulf Coast area throughout the 1990s.

both in terms of the number of casinos and the size of each casino. The Vicksburg market consists of four casinos—Harrah’s, Ameristar, Isle of Capri and the Rainbow. Revenue from these casinos totaled \$235 million in 2001. The Vicksburg casinos have nearly 3,700 EGDs and 92 table games within 112,500 square feet of casino floor space. These casinos employ more than 2,500 people.

Bayou Caddy’s Jubilee and the Lighthouse Point Casino make up the Greenville market. These casinos had combined revenue of \$75 million in 2001. Bayou Caddy’s Jubilee employs 304 people, and the Lighthouse

Point Casino employs 274. Bayou Caddy’s Jubilee offers nearly 1,100 EGDs and 13 table games within 28,500 square feet of casino floor space. Lighthouse Point Casino has 22,000 square feet of casino floor space, 840 EGDs and 14 table games.

The Natchez market consists of one casino, the Isle of Capri. Revenue topped \$36 million in 2001, and employment is 367. The Isle of Capri has 702 EGDs and 15 table games within 15,800 square feet of casino floor space. The casino was one of the first in Mississippi, opening in February 1993.

IV. Casinos and Local Employment— An Empirical Analysis

Introduction

There have been several academic studies that have explored the impact of casinos on local employment. While the results are somewhat mixed, the studies generally suggest that casinos do increase employment in the local area or at least do not lead to an employment decrease. A study of Illinois casinos found that of eight casinos, six had no significant impact on total employment.²⁵ However, another study of Illinois casinos found that 10 casinos generated more than 17,000 new jobs.²⁶ A study of Colorado casinos found that Indian gambling led to 6,100 new jobs.²⁷ A study of Missouri casinos also found positive employment effects—nearly 12,200 new jobs for the Show-Me State.²⁸

This section presents two analyses of county employment changes after the introduction of casinos. The first analysis uses monthly household employment data to explore the impact of casinos on resident employment in each county, whereas the second analysis uses annual payroll employment data to detect employment changes in specific industries, regardless of employees' county of residence. An important point is that because household and payroll data measure employment in different ways, the figures for each will neither be equal nor directly comparable. Household employment is derived from a survey of households and is the number of people who are employed, whereas payroll employment is derived from a survey of firms and is the number of jobs. For example, a county with a population of 10,000 may have 4,000 residents who work in the county, but as a result of a high commercial base the county may attract another 8,000 workers from nearby counties. Thus, total household employment for the county is 4,000 but total payroll employment is 12,000 (4,000 resident employment + 8,000 out-of-county employees who work in the county).

For both analyses, six counties were examined—two in Mississippi, two in Illinois, one in Iowa and one in Missouri. To provide an idea of different employment effects for urban and rural casinos, several of the casinos were in urban areas and others were in rural areas. Urban and rural counties were also chosen to illustrate the relative difficulties in detecting the employment effects of casino gambling in urban areas. Finally, some of the counties had only one casino, whereas other counties had numerous casinos that opened at various times throughout the 1990s. In the case of numerous casinos, only the aggregated effect of all casinos will be discernable.

For the first analysis, household employment after casino introduction was compared with total household employment before casino introduction. Seasonally adjusted monthly household employment was obtained for each of the six counties during the period January 1986 to December 2001 from the U.S. Bureau of Labor Statistics. For each county, an empirical model was developed to capture employment changes several years before casino introduction. Employment changes prior to casino introduction were then used to forecast from the date of casino introduction through December 2001 (end of sample period). These forecasts represent the level of employment that would have existed if the casino(s) had not been opened. The difference between the actual and forecasted employment change is then the estimated effect of the casino(s). A description of the data and forecasting methodology is located in the Appendix.

The second analysis used payroll employment data to compare county employment in construction, manufacturing, retail trade, services and finance before and after casino introduction.²⁹ If casinos cause an influx of new businesses and/or residents to the county, it is expected that employment in these sectors will have increased since the introduction of casino gambling. This may be especially true for service and retail trade employment. Conversely, if casinos cannibalize existing retail and service sector business, then employment in these sectors will have decreased since casino gambling was introduced.

The analysis did not consider employment in agriculture, government or transportation, as employment in these sectors is unlikely to be significantly influenced by casino gambling. Because payroll employment data at the county level is on an annual basis rather than a monthly or quarterly basis, the sample size is not adequate for running forecast models. Thus, the analysis simply involves comparing employment levels in each sector pre- and post-casino introduction.

Casino Counties

The counties used in the subsequent analyses were Warren County (Vicksburg casino market) and Tunica County (Tunica casino market) in Mississippi, Massac County (one casino) and St. Clair County (one casino) in Illinois, Lee County (one casino) in Iowa, and St. Louis County (one casino) in Missouri.

The Vicksburg casino market in Warren County, Miss., consists of four casinos. Warren County is a relatively rural casino market located along the Mississippi River in central Mississippi. The Isle of Capri opened in February 1993, Harrah's opened in October 1993,

and Ameristar and the Rainbow casino began operations in January and July of 1994, respectively. These casinos employed 2,443 people as of December 2001, of whom 75 percent lived in Warren County. Total employment in Warren County is 25,030, and the population is nearly 50,000. The unemployment rate in January 1993, one month before the first casino opened, was 8.8 percent. The unemployment rate was 4.2 percent at the end of 2001.

There are nine casinos in Tunica County, Miss. Like Warren County (about 200 miles to the south of Tunica County), Tunica is a rural casino market, although it does serve the greater Memphis area, located 25 miles to the north. Casino gambling is the primary industry in Tunica County, which has a population of 9,600. The first casino opened in Tunica in August 1992. Tunica casinos are listed in Table 6. The number of people employed at Tunica casinos was 12,689 during 2001, of whom 30 percent were from Tunica County. The unemployment rate in Tunica County in September 1992 was 10.7 percent. In December 2001, the unemployment rate was 7.1 percent, with the average unemployment for 2001 at 5.4 percent.

While unemployment in Warren and Tunica counties did fall since the introduction of casino gambling, unemployment across Mississippi also dropped during the same period. Unemployment averaged 8.2 percent in 1992 and 5.5 percent in 2001. This highlights the fact that employment changes in a casino county may be due to state and national business cycle changes as well as the introduction of casino gambling.

Harrah's Metropolis casino is located in Massac County, Ill., a rural county along the Ohio River. Total gambling revenue approached \$120 million in 2001. Harrah's opened in February 1993 and is the only casino in Massac County. Of the 883 people employed by the casino, 44 percent are from Massac County. The population of Massac County is 15,000, and total employment is about 7,500. The unemployment rate in Massac County before Harrah's began operations was 9.5 percent. As of December 2001, the unemployment rate in Massac County was 4.4 percent. Harrah's faces competition from casinos in southeastern Missouri and southern Indiana.

The Casino Queen is located in East St. Louis, Ill., in St. Clair County. St. Clair County is relatively urban, as it is located across the Mississippi River from the city of St. Louis. The Casino Queen is the only casino located in St. Clair County, but neighboring Madison County has one casino, and there is an additional casino in St. Louis City. The Casino Queen opened in July 1993 and employs 1,184 people, of whom 80 percent are

from St. Clair County. Total gambling revenue topped \$155 million in 2001. St. Clair County has a population of 256,600, and total employment reached 108,000 at the end of 2001. Prior to the opening of the Casino Queen, the unemployment rate in St. Clair County was 9.4 percent. Unemployment dipped to 5.9 percent at the end of 2001.

As with Mississippi, statewide unemployment also fell since the introduction of casino gambling. In 1993, the average Illinois unemployment rate was 7.5 percent. The unemployment rate dropped to 5.4 percent during 2001. Again, county level employment changes may be due to business cycle conditions as well as casino introduction.

Lee County, Iowa, has one casino—Catfish Bend, which opened in November 1994. Lee County is a rural county in southeast Iowa with a population of 37,313 and total employment of nearly 17,000. The Catfish Bend casino employs 367 people. Forty-five percent are from Lee County. The unemployment rate in Lee County was 3.7 percent in 1994 and fell to 3.3 percent during 2001. These figures are the same for statewide unemployment in Iowa. Gambling revenue from the Catfish Bend casino was \$29 million during 2001. Catfish Bend faces competition from casinos in Peoria and Des Moines.

St. Louis County, Mo., is the final county examined. Harrah's is the only casino in St. Louis County, which opened in March 1997. Harrah's employs 2,050 people (656 from the home county) and has annual revenue of \$270 million, ranking it first among Missouri's 11 casinos. Harrah's faces direct competition from the President Casino in downtown St. Louis and the Ameristar casino in neighboring St. Charles County. St. Louis County is a suburban county surrounding the city of St. Louis. St. Louis County has a population of around 1 million and employs roughly 541,000 people. The unemployment rate in St. Louis County was 3.1 percent in 1997 and 3.9 percent in 2001. The state of Missouri experienced an increase in unemployment during the same time period, rising from 4.2 percent in 1997 to 4.7 percent in 2001.

Summary statistics for each of the six counties are shown in Table 8.

Household Employment Forecast Results

Warren and Tunica Counties, Mississippi

Actual and forecasted household employment for Warren and Tunica counties in Mississippi are shown in Figures 1 and 2. Recall that both are rural counties and that casino gambling constitutes a major industry in each county. The graphs reveal that employment in

TABLE 8 – CASINO COUNTY STATISTICS

	Warren County, Miss.	Tunica County, Miss.	Massac County, Ill.	St. Clair County, Ill.	Lee County, Iowa	St. Louis County, Mo.
Casino Employment	2,443	12,689	883	1,184	367	2,050
Number of Casinos in County	4	9	1	1	1	1
County Employment	25,030	5,636	7,665	108,270	16,708	540,981
County Population	49,343	9,635	15,081	256,599	33,313	1,015,417
Percent (Number) of Casino Employees from Home County	75 (1,832)	30 (3,807)	44 (389)	80 (947)	45 (165)	32 (656)
County Unemployment rate- pre-Casino (%)	8.8	10.7	9.5	9.4	3.7	3.1
County Unemployment rate- post-Casino (%)	4.2	7.1	4.4	5.9	3.3	3.9
State Unemployment rate- pre-Casino (%)	8.2	8.2	7.5	7.5	3.7	4.2
State Unemployment rate- post-Casino (%)	5.5	5.5	5.4	5.4	3.3	4.7
Employment/Population Ratio- pre-Casino	0.430	0.302	0.381	0.400	0.477	0.534
Employment/Population Ratio- post-Casino	0.507	0.591	0.509	0.418	0.449	0.531
Date of First Casino Opening	2/1993	8/1992	2/1993	7/1993	11/1994	3/1997

NOTE: See text for casino pre- and post-dates. All employment data are from December 2001 and population data are 1999. Home county casino employment was obtained from contacting casinos. For multiple casinos in a county, the above figure represents the county average.

FIGURE 1
Warren County, Miss. - Household Employment

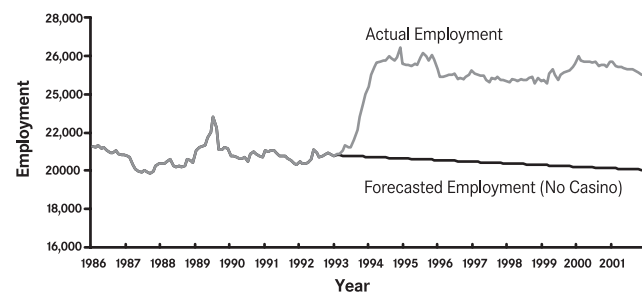
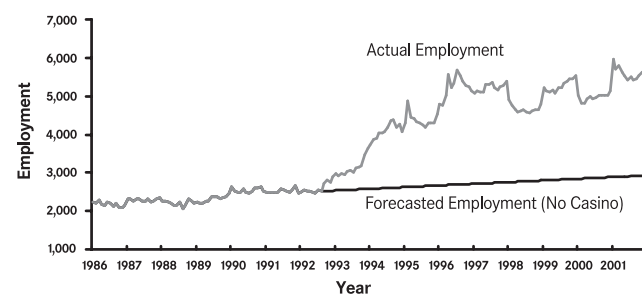


FIGURE 2
Tunica County, Miss.- Household Employment



both counties significantly increased since the adoption of casino gambling. There was a dramatic jump in employment in Warren County in 1993 and 1994, the two years in which new casinos began operations. Since that time, employment growth has been relatively flat in Warren County. Employment in Tunica County has grown steadily since the first casino was introduced in late 1992, reflecting the steady increase in the number of casinos in Tunica County throughout the mid to late 1990s. Forecasted employment reveals that employment would have decreased slightly in Warren County without casino gambling, but Tunica County employment would have increased slightly throughout the 1990s without casino gambling.

As of December 2001, Tunica County household employment increased by 3,144 since the introduction of the first casino, while the population increased by 1,172. Warren County employment increased by 4,225 since the introduction of the first casino, while its population increased by 910. As a result, the employment-to-population ratios for both counties have increased (Table 8) since the introduction of casino gambling.³⁰ The employment-to-population ratio increased by nearly 29 percentage points in Tunica County and by more than 7 percentage points in

Warren County. Casino employment in Tunica County is greater than the population of the county; so, the bulk of employees who work in Tunica casinos live outside of the county. In Warren County, total casino employment for residents is about 1,800, but the increase in employment since casino introduction was nearly 5,000 with little change (910) in population. This suggests that during the sample period there was employment growth in Warren County outside of the casino industry

Massac and St. Clair Counties, Illinois

Figures 3 and 4 show actual and forecasted employment for Massac and St. Clair counties in Illinois. St. Clair County employment is highly volatile. In a county with more than 250,000 people and household employment near 108,000, the exact impact of one casino on local employment is hard to determine, given the relative smallness of casino employment to total employment and the volatility of overall county employment. Prior to 2000, actual and forecasted employment trended upward. Beyond this point, however, actual employment fell below the forecasted decrease in employment. Total employment has risen by 1,601 since the introduction of the casino (1,184 casino employees, 947 from St. Clair County), but the population of St. Clair County has decreased nearly 7,500. As a result, the employment-to-population ratio has increased slightly from pre-casino dates (1.7 percentage points). It thus appears that casino gambling has not hurt St. Clair County employment, but the volatility of total employment and the loss in population leads one to question the overall ability of one casino to maintain or foster employment growth in an urban area.

Employment in rural Massac County markedly increased at the time Harrah's began operations and has increased steadily since that time. Without the introduction of casino gambling, employment is forecasted to have decreased at a rate of about five jobs per month. By the end of 2001, actual employment was higher than forecasted employment, but the growth in actual employment has been relatively slow since the introduction of casino gambling. Employment increased by 1,927 since the introduction of casino gambling (which employs 389 people from Massac County), and the population of Massac County increased by 18. As a result, the employment-to-population ratio increased nearly 13 percentage points since the introduction of casino gambling.

Lee County, Iowa

Forecasted and actual employment for rural Lee County, Iowa, are shown in Figure 5. Actual employ-

FIGURE 3
Massac County, Ill. - Household Employment

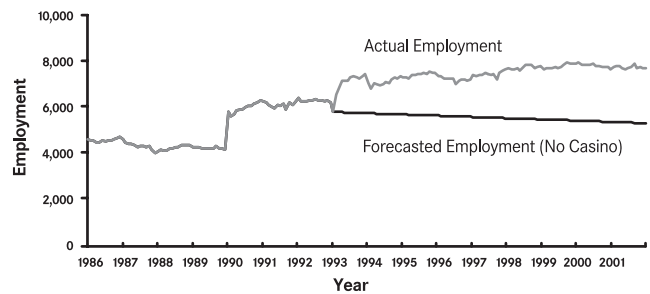


FIGURE 4
St. Clair County, Ill. - Household Employment

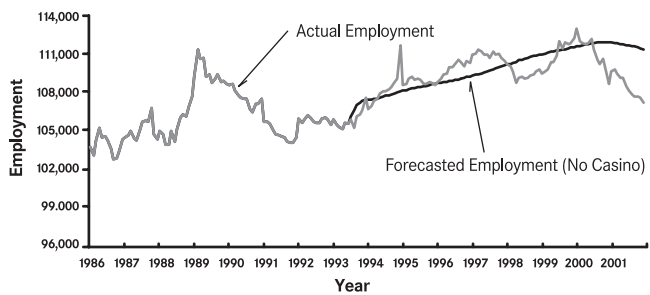
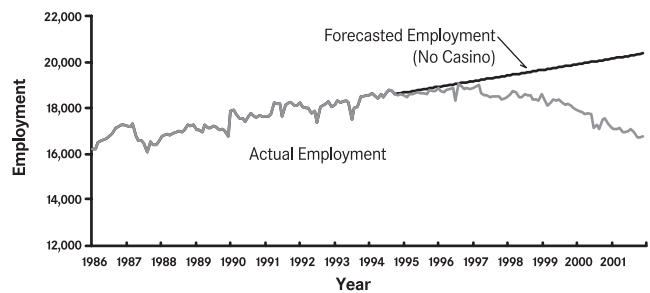


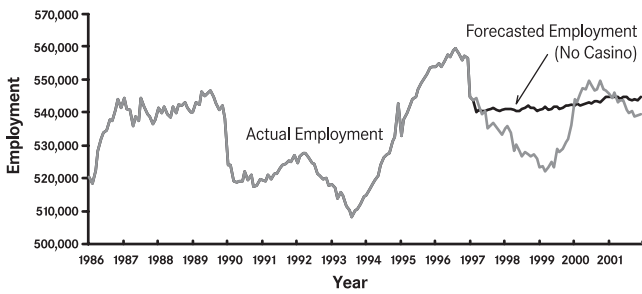
FIGURE 5
Lee County, Iowa - Household Employment



ment remained relatively constant around the time the Catfish Bend casino began operations, but has steadily decreased since that time. Forecasted employment continues a gradual increase since the date of casino introduction. At the end of 2001, Lee County had lost 1,846 jobs since the casino began operations and experienced a population decrease of 1,652. As a result, the employment-to-population ratio decreased by nearly 3 percentage points since the casino was introduced. Unlike rural counties such as Massac County, Ill., and Tunica and Warren counties in Mississippi, the introduction of casino gambling in Lee County has not led to an increase in employment. It is possible, however,

FIGURE 6

St. Louis County, Mo. - Household Employment



that the introduction of casino gambling has slowed the decrease in employment and population in Lee County.

St. Louis County, Mo.

St. Louis County’s total household employment is nearly 550,000 and, like urban St. Clair County, it was quite variable during the sample period, as seen in Figure 6. The impact of one casino employing 2,050 people, of whom only 32 percent are from St. Louis County, cannot be accurately inferred from the data. Employment continued to fall after the casino was introduced, but then increased slightly above forecasted levels in 2000. It is likely that Harrah’s has created some jobs in St. Louis County, but the direct impact of the casino on total employment is masked by highly variable total employment and the relatively small employment contribution made by a single casino.

Employment Changes by Sector

Sector employment changes before and after casino introduction for each of the six counties are shown in Tables 9 through 14. For each county, service sector employment excludes casino employment, which is listed as a separate sector. Recall that changes in sector employment cannot be directly compared with household employment changes in the previous section because the two employment measures are different.

Warren and Tunica Counties, Mississippi

Warren County, Miss., (Table 9) experienced a large increase in manufacturing, service and construction employment since the introduction of casino gambling, which constitutes 36 percent of the total increase in payroll employment. The increase in manufacturing employment is quite large, given the national decrease in manufacturing employment during the 1990s. Moderate decreases in retail trade and financial employment occurred within the county during the same time period. Because casino gambling is a relatively large industry in Warren County,

TABLE 9 – WARREN COUNTY, MISS., PAYROLL EMPLOYMENT CHANGES BY SECTOR

Sector	Employment–Initial Casino Opening	Employment December 2001	Employment Gain or Loss (% change)
Manufacturing	3,408	5,090	1,682 (49.4)
Retail Trade	3,926	2,932	-994 (-25.3)
Services	4,114	7,674	3,560 (86.5)
Financial	597	487	-110 (-18.4)
Construction	363	590	227 (62.5)
Casino(s)	—	2,443	2,443
TOTAL GAIN OR LOSS			6,808 (54.9)

NOTE: Date of first casino opening is listed in Table 8. Service sector employment excludes casino employment.

DATA SOURCES: 1993, 1997 data from County and State Quick Facts, County Business Patterns (www.census.gov); 1992, 1994 data from GovStats-USA counties; (<http://govinfo.kerr.orst.edu/php/commerce/state/show.php>); 2001 data from Economic Census, County Business Patterns (www.census.gov)

TABLE 10 – TUNICA COUNTY, MISS., PAYROLL EMPLOYMENT CHANGES BY SECTOR

Sector	Employment–Initial Casino Opening	Employment December 2001	Employment Gain or Loss (% change)
Manufacturing	375	614	239 (63.7)
Retail Trade	204	374	170 (83.3)
Services	123	2,441	2,318 (1884.5)
Financial	77	99	22 (28.6)
Construction	15	60	45 (300.0)
Casino(s)	—	12,689	12,689
TOTAL GAIN OR LOSS			15,483 (1950.0)

NOTE: See footnote in Table 9.

the findings suggest that the increase in service and construction sector employment and the decrease in retail trade employment may be attributed to casino gambling.

Tunica County, Miss., (Table 10) had employment increases in all five sectors, with the largest increase in the service sector. Given that casino gambling is the predominant industry in Tunica County, the data in Table 10 suggest that employment increases in the various sectors can be attributed, in large part, to the introduction of casino gambling. Overall payroll employment increased by more than 1900 percent since casino gambling was introduced in 1992, of which a large portion of this increase (82 percent) is attributed to casino employment.

Massac and St. Clair Counties, Illinois

Massac County, Ill., (Table 11) experienced an increase in service and financial employment, but a

TABLE 11 – MASSAC COUNTY, ILL., PAYROLL EMPLOYMENT CHANGES BY SECTOR

Sector	Employment–Initial Casino Opening	Employment December 2001	Employment Gain or Loss (% change)
Manufacturing	736	638	-98 (-13.3)
Retail Trade	695	353	-342 (-49.2)
Services	874	1,379	505 (57.8)
Financial	108	198	90 (83.3)
Construction	126	100	-26 (-20.6)
Casino(s)	—	883	883
TOTAL GAIN OR LOSS			1,012 (39.9)

NOTE: See footnote in Table 9.

TABLE 12 – ST. CLAIR COUNTY, ILL., PAYROLL EMPLOYMENT CHANGES BY SECTOR

Sector	Employment–Initial Casino Opening	Employment December 2001	Employment Gain or Loss (% change)
Manufacturing	7,318	6,724	-594 (-8.1)
Retail Trade	18,154	12,872	-5,282 (-29.1)
Services	25,922	39,102	13,180 (50.8)
Financial	3,158	4,274	1,116 (35.3)
Construction	2,626	3,927	1,301 (49.5)
Casino(s)	—	1,184	1,184
TOTAL GAIN OR LOSS			10,905 (19.1)

NOTE: See footnote in Table 9.

decrease in other sectors. With casino gambling, payroll employment increased nearly 40 percent. Casino gambling provides the largest contribution to increases in total payroll employment in Massac County (87 percent). Without casino gambling, the gain in total payroll employment in Massac County would have only been roughly 130 people.

Casino gambling in St. Clair County, Ill., (Table 12) contributed to roughly 10 percent of the gain in payroll employment since casino gambling was introduced. Service, financial and construction employment all increased by an average of 43 percent, but manufacturing and retail trade decreased by 8 percent and 29 percent, respectively. The employment impact of casino gambling is much smaller than changes in other sectors, but it still contributes moderately to net changes in total payroll employment.

Lee County, Iowa

Without casino gambling, Lee County, Iowa (Table 13), would have experienced an overall decrease in payroll employment since the period of casino introduc-

TABLE 13 – LEE COUNTY, IOWA, PAYROLL EMPLOYMENT CHANGES BY SECTOR

Sector	Employment–Initial Casino Opening	Employment December 2001	Employment Gain or Loss (% change)
Manufacturing	5,991	5,130	-861 (-14.4)
Retail Trade	3,144	2,057	-1,087 (-34.6)
Services	3,573	5,229	1,656 (46.3)
Financial	482	558	76 (15.8)
Construction	796	669	-127 (-16.0)
Casino(s)	—	367	367
TOTAL GAIN OR LOSS			24 (0.17)

NOTE: See footnote in Table 9.

TABLE 14 – ST. LOUIS COUNTY, MO., PAYROLL EMPLOYMENT CHANGES BY SECTOR

Sector	Employment–Initial Casino Opening	Employment December 2001	Employment Gain or Loss (% change)
Manufacturing	97,608	59,048	-38,560 (-39.5)
Retail Trade	113,407	74,170	-39,237 (-34.6)
Services	207,947	287,982	80,035 (38.5)
Financial	45,162	49,869	4,707 (10.4)
Construction	32,087	39,876	7,789 (24.3)
Casino(s)	—	2,050	2,050
TOTAL GAIN OR LOSS			16,784 (3.38)

NOTE: See footnote in Table 9.

tion. While service and financial employment increased during the sample period, these increases were met by larger decreases in manufacturing, retail trade and construction employment, resulting in the loss of 343 jobs. Casino employment of 367 provided a net gain of 24 jobs in Lee County. Household employment and population fell for Lee County, but payroll employment remained relatively constant since the casino was introduced. This suggests that either some of the original population in Lee County moved outside of the county and continues to work in Lee County or more residents of neighboring counties now work in Lee County.

St. Louis County, Mo.

Like St. Clair County in Illinois, the casino industry is a relatively minor employer in St. Louis County, Mo., (Table 14). However, the 2,050 casino jobs contributed to roughly 12 percent of the increase in total payroll employment in St. Louis County (compared with 11 percent in urban St. Clair County). Large decreases in manufacturing and retail trade occurred, but these decreases were met with slightly larger increases in

service, financial and construction employment. Thus, even though casino gambling may be a minor industry in urban areas, casino gambling can make up a significant portion of net payroll employment gains or losses.

Summary

Determining the exact impact of casino gambling on local employment involves an examination of employment changes in the local area before and after the introduction of casino gambling. In three of four cases, it appears that rural counties that adopt casino gambling experience increased household and payroll employment as a direct result. This seems to be true

even though casino employment is dispersed over several counties rather than just the home county, and employment gains are much greater in rural counties that have adopted casino gambling as a major or predominant industry. It is harder to detect the impact of casino gambling in more metropolitan counties since employment is highly variable in these counties and casino gambling constitutes a small portion of total employment. However, casino gambling in urban areas can clearly constitute a significant portion of net payroll employment gains or losses even though casino gambling is a minor industry in urban areas.

V. Success or Failure?

Whether casinos have been a successful tool for economic growth is a difficult question to answer, and the findings for one county or city cannot be generalized for the country as a whole.

The economic view of casino taxes is they cannot be counted as a benefit to society. Casino taxes simply result in allocation of income from one group to another. The subjective issue regarding casino taxes is where society values casino tax dollars the most. For example, some might say that casino tax revenue used for education is a net benefit to society because the education benefits outweigh the costs to casino operators. Conversely, others may argue that it is better if the potential tax dollars stay with casino operators in order to increase investment and economic growth. While local officials often promote casino tax revenue as a benefit to the local area, casino tax revenue is not new money and results in a loss of income and investment to casino operators. When officials claim tax revenue is a benefit to the local area, they are suggesting that a dollar of reallocated casino tax revenue has a greater benefit than if the dollar stayed with the casino. Every community dealing with casino gambling must evaluate where it most values casino revenue.

The employment effects of casino gambling are also difficult to quantify. Casino employment is not always synonymous with economic growth and development. Casino jobs only lead to economic development if they create a greater value to society. Casino gambling may reduce employment in other local industries as a result of cannibalizing these industries. The degree of potential cannibalization depends upon the origin of the bulk of casino patrons. In addition, the casino may draw labor from outside of the local area, thus leaving local employment conditions unchanged if this labor does not relocate to the local area. Local officials and the public need to understand from where a casino will draw its workforce.

One potential cost of casino gambling not mentioned thus far is gambling addiction and crime. There

have been numerous studies suggesting casino gambling is responsible for increased gambling addiction and crime rates.³¹ Casino gambling may lead to increases in suicide rates, theft and bankruptcies, as well as increased expenditures on related social services. Many of these studies make different assumptions regarding what should be counted as a benefit and a cost, but one quantitative study conducts a cost-benefit analysis and estimates that casino gambling has a net social cost of \$156 per person. However, many cost-benefit studies can be subjective, and the methodology can be structured to achieve results that support the author's position on casino gambling. Regardless, each community with a casino or contemplating the introduction of casino gambling should be aware of these studies and their assumptions and conduct their own cost-benefit analysis rather than relying on results from different communities.

In summary, several issues should be evaluated by communities and their public officials:

- Understanding that casino tax revenue is not new money to society and that there is cost and benefit to taxing casino revenue. Do casino dollars create a greater benefit if kept in the hands of casino owners, or does the earmarking of casino tax dollars to state and local programs generate a greater benefit?
- Understanding employment and economic development. While casinos do generate jobs, it is possible that these jobs come at the expense of other jobs in the local area. Economic development only occurs if there is a net increase in local employment due to the casino (household versus payroll employment changes).
- Studying the impact of a casino on existing businesses. Is this something that should be of concern? An understanding of where casino gamblers will come from may provide insights into what businesses, if any, may be affected by the casino.
- Assessing whether casinos really generate social costs due to crime and addiction. If so, how should these costs be measured?

VI. Conclusion

This report provides an overview of the casino industry and a detailed discussion of the major issues surrounding casinos and economic development. The impact of casino gambling on local employment is explored through the use of forecasting models. Finally, the report discusses how one should evaluate the success or failure of casino gambling.

One question is how much the industry will grow in the future. The current budget crises facing state and local governments may force a further expansion of casino gambling across the country. There is little evidence that the industry has reached the saturation point—a “build it and they will come” attitude currently pervades the industry. While the evidence here suggests that counties that adopt casino gambling as a major industry are likely to see large employment gains, this is not to suggest that every county can become like

Tunica, Miss. Attitudes regarding the spread of casino gambling in a given local area, costly industry regulation and increasing casino competition may hinder the growth of gambling in rural areas.

In addition, the degree to which state and local governments rely on casino revenue raises the question of whether the casino industry is recession-proof. One would expect that the growth of the casino industry is contingent upon economic conditions, and if the industry is highly procyclical then casino revenues may do little to lessen the budgetary impacts of an economic slowdown. The fact that many casino states are facing budget crises similar to non-casino states suggests this may be true. However, little research has been done on this issue. Regardless of what the future holds, there is little doubt that casinos are here to stay and that more communities will be faced with the decision to adopt casino gambling.

Data and Empirical Methodology for Forecasting Models

Seasonally adjusted monthly household employment was obtained for each of the six counties during the period January 1986 to December 2001 from the U.S. Bureau of Labor Statistics. Because most of the six counties introduced casino gambling in the early to mid 1990s, the length of the data series was chosen to ensure an adequate sample of observations pre- and post-casino adoption.

The behavior of the employment data series for each county prior to casino adoption (see Table 8 for casino opening dates) was captured using ARMA(p,q) modeling.³² AR refers to the autoregressive component (lagged values of the dependent variable—employment in this case), and MA stands for moving average (lagged values of the forecast error). The number of AR terms (or lags) is denoted by p , and the number of moving average terms (or lags) is denoted by q .³³ The ARMA models used, therefore, model employment in current time t as a function of employment in time $t-1$ to time $t-p$ and forecast errors in time t to time $t-q$.³⁴

Several criteria are used to determine the appropriate number of AR and MA terms (termed model order) for each employment series.³⁵ The appropriate ARMA models are: Tunica County ARMA (2,1), Massac County ARMA (1,0), Warren County ARMA (2,0), St. Clair County ARMA (1,4), Lee County ARMA (1,0) and St. Louis County (1,2).

These models were estimated for each county over the sample range January 1986 to the month prior to the introduction of casino gambling.³⁶ Visual inspection of the St. Louis County and St. Clair County employment series revealed business cycle effects, (i.e., large peaks and troughs in each employment series). No discernable effects were present for the four rural counties. To capture these effects in the empirical models, the coincident index for both Missouri and Illinois was included as a variable in the respective ARMA model.³⁷

Estimates were obtained for each of the AR and MA terms, and the coincident index terms if applicable.³⁸ Using these estimates, employment was then forecasted dynamically from the month of casino adoption through December 2001.³⁹ Comparing this forecasted employment with actual employment since the beginning of casino operations allows an examination of any changes in employment since the introduction of casino(s).

Endnotes

- 1 These values and all revenue values in this report are revenue to the casino after subtracting player winnings. In comparison, 38 state lotteries generated nearly \$38 billion in 2001; pari-mutuel horse and greyhound racing generated more than \$3.25 billion (legal in 43 states) and \$550 million (legal in 15 states), respectively.
- 2 From the American Gaming Association (www.americangaming.org).
- 3 West Virginia, Delaware, Rhode Island, Louisiana, Iowa and New Mexico offer video lottery terminals (VLTs) and slot machines as part of their state lotteries. These outlets (sometimes called racinos) are usually located at pari-mutuel racetracks and are run by the state and therefore not considered corporate casinos. The revenue from these outlets (roughly \$500 million annually) is part of each state's overall lottery revenue.
- 4 Indian tribes use gambling revenue from their casinos to foster economic development on their reservations. Economic development from corporate casino gambling, however, has the potential to affect a much greater population.
- 5 States have negotiated payments from tribes in return for certain services such as security and maintaining and improving highway access to casinos.
- 6 All data presented in this report are from the following sources: Bear Stearns 2002–2003 *North American Gaming Almanac*, Huntington Press, Las Vegas; *The National Gambling Impact Study Commission's Final Report* (www.casino-gambling-reports.com/GamblingStudy/); the American Gaming Association (www.americangaming.org); and each state's gaming commission.
- 7 In many cases, the riverboat casinos are "fixed in dock," meaning they cannot move freely along a river.
- 8 For example, see Keith McBee. "A Review of the Literature of Casino Economic Impacts and Some Local Predictions." *Casino Forum Reports*, University of Wisconsin Colleges—Marathon.
- 9 Economists often measure the financial burden of an activity with the income elasticity of demand for that activity. An income elasticity less than 1 means that a certain percentage change in income results in a smaller percentage change in quantity demanded, whereas an income elasticity greater than 1 means that a certain percentage change in income results in a greater percentage change in quantity demanded. An income elasticity less than 1 suggests lower-income individuals bear a greater burden, whereas an income elasticity greater than 1 suggests higher-income individuals bear a greater burden.
- 10 Daniel Suits. "Gambling Taxes: Regressivity and Revenue Potential." *National Tax Journal*, vol. 30, no. 1 (March 1977): 19–35.
- 11 Paul Mason, Stephen Shapiro and Mary Borg. "Gaming Tax Incidence for Three Groups of Las Vegas Gamblers." *Applied Economics*, vol. 21, no. 9 (September 1989): 1267–77.
- 12 Slot machines in the past used gears and other mechanical means to determine the play outcome. For a more detailed discussion of the mechanics of slot machines, see www.wizardofodds.com/games/slots.
- 13 A description of all casino table games can be found at www.wizardofodds.com
- 14 Bear Stearns 2002–2003 *North American Gaming Almanac*, page 605.
- 15 Much of the discussion in this section is taken from "Casinos and Economic Development" by Thomas Garrett, appearing

- in the Winter 2002–2003 issue of *Bridges*, published by the Federal Reserve Bank of St. Louis.
- 16 Evaluation of the social welfare effects of casino gambling should consider other benefits of casino gambling besides employment, as well as possible costs such as addiction and crime. See Earl Grinols. “Cutting the Cards and Craps: Right Thinking About Gambling Economics.” Unpublished manuscript, Department of Economics, University of Illinois, December 2001.
 - 17 R. Gazel, W. Thompson and D. Rickman. “The Economic Impacts of Native American Gaming in Wisconsin.” *Gaming Research and Review Journal*, vol. 2 no. 2 (1995): 43–60; KPMG Management Consulting. “One Year Review of Casino Windsor,” prepared for Ontario Casino Corp., Toronto, 1995; T. Blois, S. Cunningham and W. Lott. “The Bridgeport Casino Proposals: An Economic Evaluation.” Connecticut Center for Economic Analysis, University of Connecticut, 1995.
 - 18 Mary Borg and Paul Mason. “Earmarked Lottery Revenues: Positive Windfall or Concealed Redistribution Mechanism?” *Journal of Education Finance*, vol. 15 (1990): 289–301; Charles Spindler. “The Lottery and Education: Robbing Peter to Pay Paul?” *Public Budgeting and Finance*, vol. 15 (1995): 54–62; Thomas Garrett. “Earmarked Lottery Revenues for Education: A New Test of Fungibility.” *Journal of Education Finance*, vol. 26 (2001): 219–238.
 - 19 Michael Przybylski, Daniel Felsenstein, Daniel Freeman and Laura Littlepage. “Does Gambling Complement the Tourist Industry? Some Empirical Evidence of Import Substitution and Demand Displacement.” *Tourism Economics*, vol. 4, no. 3 (1998): 213–231.
 - 20 The first two possibilities also apply to any business wishing to open in a certain area, but to a lesser extent depending upon the type of business (i.e., large regional mall, baseball team, etc.).
 - 21 Donald Siegel and Gary Anders. “Public Policy and the Displacement Effects of Casinos: A Case Study of Riverboat Gambling in Missouri.” *Journal of Gambling Studies*, vol. 15, no. 2 (Summer 1999): 105–121.
 - 22 Gary Anders, Donald Siegel and Munther Yacoub. “Does Indian Casino Gambling Reduce State Revenues?” *Contemporary Economic Policy*, vol. 16 (July 1998): 347–355.
 - 23 See note 15.
 - 24 Some of the casinos are not in the Eighth District, but are located in states that have portions in the Eighth District. Much of the data in this section is from Bear Stearns 2002–2003 *North American Gaming Almanac* and each state’s gaming commission web site and annual reports.
 - 25 E. Grinols. “Bluff or Winning Hand? Riverboat Gambling and Regional Employment and Unemployment,” *Illinois Business Review*, vol. 51, no. 1, 1994: 8–11.
 - 26 G. Hewings, G. Schindler and B. Nafziger. “The Impact of Riverboat Casino Gambling on the Illinois Economy 1991–1995.” Report to the Illinois Gaming Board, Chicago: Regional Economics Applications Laboratory, 1996.
 - 27 Center for Business and Economic Forecasting Inc. “Economic Impact of Limited Gaming in Colorado.” Regis University, Denver, Colo., 1995.
 - 28 C. Leven and D. Phares. “Casino Gaming in Missouri: The Spending Displacement Effect and Net Economic Impact.” Proceedings of the 90th Annual Conference on Taxation, National Tax Association, Chicago, 1998.
 - 29 A description of those businesses included in each sector can be found at www.census.gov/epcd/cbp/map/97data/29/189.txt.
 - 30 This finding agrees with those found in James Snyder. “The Effects of Casino Gaming in Tunica County, Mississippi 1992–1997.” Social Research Report Series 99–2, Social Science Research Center, Mississippi State University, September 1999.
 - 31 Earl Grinols. “Cutting the Cards and Craps: Right Thinking About Gambling Economics.” Working paper, Department of Economics, University of Illinois, December 2001. This is an excellent review of the literature on estimating the costs and benefits of casino gambling.
 - 32 See: George E.P. Box and Gwilym M. Jenkins. *Time Series Analysis: Forecasting and Control*. Revised edition, Holden-Day, 1976 for a detailed discussion of ARMA modeling.
 - 33 Because the ARMA models also consider the degree of integration of the employment series, technically they are ARIMA models, where ‘I’ is the order of integration of the series or the number of differencing operations it takes to make the series stationary. To avoid a discussion on time-series econometrics, simply put, a variable is stationary if the mean and variance of the variable do not change over time. For time-series regressions, all variables must be stationary (ignoring a discussion on co-integration) in order to avoid meaningless results. A variable could be trend stationary, so that adding a linear time trend to the model renders the series stationary (I=0), or a variable could be first-difference stationary in which first-differencing the series ($X_t - X_{t-1}$) renders the series stationary (I=1).
 - 34 Augmented Dickey-Fuller (ADF) tests for stationarity (see note 33) were conducted on the employment series (pre-casino adoption) for each of the six counties. Employment for St. Clair County and St. Louis County was stationary in levels, employment for Lee County was trend stationary and employment for Tunica, Massac and Warren counties was first-difference stationary. The ADF test results are available from the author.
 - 35 The Schwarz Test and the Aikake Information Criterion test were used to determine model order.
 - 36 Estimates from the ARMA models are available from the author.
 - 37 The coincident indices are available from the Federal Reserve Bank of Philadelphia at www.phil.frb.org/econ/stateindexes/index.html. The coincident index for each state weights changes in payroll employment, average hours worked in manufacturing, the unemployment rate and real wages paid. The indices are available monthly and are one of the most commonly used methods of capturing regional business cycle effects. For a discussion of regional coincident indices, see Theodore Crone. “Consistent Economic Indexes for the 50 States.” Working paper 02–7, Research Department, Federal Reserve Bank of Philadelphia, May 2002.
 - 38 The forecast models also account for, if necessary, structural changes in the employment series prior to casino introduction. Visual inspection of the data reveals structural breaks in Massac County and St. Louis County data. See Pierre Perron. “The Great Crash, the Oil Price Shock, and the Unit Root Hypothesis.” *Econometrica*, vol. 57 (1989): 1361–1401.
 - 39 Dynamic forecasts calculate multistep forecasts starting from the first period in the forecast sample, whereas static forecasts calculate one-step-ahead forecasts using actual rather than forecasted values for lagged dependent variables. Static forecasts would not be appropriate here since the point is to forecast employment each month from the date of casino adoption through the end of the sample period.

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