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CUTTING THE CARDS AND CRAPS:
Right Thinking About Gambling Economics

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For most of the twentieth century the American gambling industry could be described as no more than a footnote to the national scene. Attention to the industry, when it occurred at all, was regional or episodic. Only after the advent of the 1990s' spread of casinos from 14 counties, all of them in Nevada except one, to hundreds of counties in dozens of states did the industry become nationally significant and the question of whether casinos were desirable a serious policy matter. This paper deals with the notional issues surrounding the social value of gambling. The emphasis is on correcting common misconceptions about the meaning of economic development and applying logic to the valid cost-benefit evaluation of casino gambling.

I.   Historical Context

During its rise to national attention in the early 1990s, the gambling industry and its spokesmen espoused the view that opposition to the spread of modern gambling should be puzzling to any sensible observer and perhaps could be understood only as the emotional outpourings of moralists or religious zealots. It was not to their advantage to acknowledge the possibility that opposition was the reasonable response to social costs that exceeded social benefits. Those in the news media at first took their lead from the industry. To provide balance to their news coverage, they unenthusiastically but dutifully included in their reports the misgivings of gambling opponents. Questioning why gambling might be opposed gradually changed, however, as newsworthy and often spectacular examples of suicides (such as losers throwing themselves from the tops of tall casinos), bankruptcies, embezzlements, murders, robberies, government corruption, and other crimes began to surface. Reporters needed less education about the harmful effects of gambling when they knew a family member or acquaintance whose life was seriously injured by gambling. Interest in the media and in

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government grew about understanding the reasons why gambling might differ from other forms of entertainment. Three questions of the time were:

1. Did the gambling industry deliver on its often extravagant promises of economic development?

2. What were the social costs that opponents seemed to assert so vehemently?

3. How did problem and pathological gamblers enter into the evaluation of gambling?

The answers to these questions required serious research, of which there was little. Meaningful academic interest in gambling did not exist in most parts of the country because commercial casino gambling had been criminalized for most of the century, often specifically prohibited in state constitutions. A handful of respected scholars outside Nevada and New Jersey had paid some attention to lotteries which were more widespread by the 1980s, but answers to most questions were unavailable.

Research from states with the most experience with casinos—New Jersey and Nevada—provided little that could be used in the social evaluation of gambling. Even though casinos had been operating in Nevada since 1931, research from Nevada had not identified, let alone quantified, the social costs of casino gambling. No measures of the benefits of casinos had been estimated and the effect of casinos on causing problem and pathological gamblers was unknown. In fact, the gambling industry initially denied that the spread of casinos affected the number of problem and pathological gamblers until the June 1999 publication of the research from the National Gambling Impact Study Commission made that position untenable. The industry's public position was that people would gamble regardless of the access to casinos and so access did not matter. Nevada experts did not know what the prevalence rate of pathological gambling was in Nevada because they did not study it.

Pioneering research by Politzer, Morrow and Leavey (1981) at Johns Hopkins University did quantify large costs associated with pathological gamblers. For a number of years this research was left undisturbed and unchallenged by the gambling industry. The industry only began to understand its significance when its implications about the damage that gambling did to society were pointed out by researchers such as Kindt (1994a,b, 1995, 1998). Thereafter, the American Gaming Association endeavored to harm the reputation of this work by questioning its methodology.[1] The industry did not conduct research of its own on this topic.

As data about problem and pathological (P&P) gamblers became more widely available, often from the studies of treatment specialists, it suggested that P&Ps lost far more in casinos than the average adult. Grinols and Omorov (1996) were among the first to raise this issue, but other research soon followed. Combining loss figures with prevalence numbers for problem and pathological gamblers implied that this tiny group of individuals (problem and pathological gamblers generally constitute fewer than 4.5 percent of the population[2])

was responsible for a large share of casino revenues, as much as one third, or even in some studies one half.[3] Not surprisingly, research in Nevada had not investigated what share of casino revenues came from problem and pathological gamblers, nor questioned what share of revenues came from the small portion of the population that gambled most. One Nevada academic testified that he had been involved in gambling research for 25 years, but that it was "surprising how little we definitely know about the social and economic impacts of this $40 billion a year industry."[4]

By the late 1990s a growing number of scholars (Kindt, Henrikkson, Gazel, Goodman, Grinols, Lesieur, Mustard, Omorov, Quinn, Rickman, Thompson, and others) had begun to ask tougher questions about problem and pathological gambling, its social costs, how much of casino industry revenues depended on the losses of problem and pathological gamblers, and whether the economic development claims of the gambling industry were credible. Whereas in the early 1990s there were almost no studies with firm numbers, by the end of the decade there were, and research continues.

II.   The Issues

The public debate over gambling has matured. We now understand, for example, that gambling creates certain social costs that other entertainment industries do not. These costs, have direct impact on other businesses and households, and do not operate through prices and markets. They therefore fall into the classification that economists call negative externalities. The social costs of gambling can be identified, in principle, and compared to its social benefits.

In spite of the improvement of our quantitative knowledge about the effects of gambling, however, misconceptions persist. Gambling opponents emphasize social costs that outweigh social benefits; proponents "increased" number of jobs and "economic development." It is not uncommon for industy-financed studies to report the effect of a casino on jobs, yet never compute the value to residents of these jobs or incorporate them into a cost-benefit assessment of casinos.

The situation is often not much more enlightened in government circles. Legislators still believe against logic that taxes raised from casinos are "free" because they are "voluntary." They commission reports to estimate how many tax dollars a casino project may provide, but never incorporate these numbers in an applicable cost-benefit study. They ask for information about jobs and taxes, but not about social welfare. What they hear of costs often must come from the citizen groups that appear before their committees.

An outside observer of the way in which casino expansion has been done can rightfully be excused for being appalled at the lack of rigor. There is not even agreement on what constitutes a review. Industry apologists sell casino projects by counting jobs, government evaluates projects by looking at tax revenues, and the citizens split according to their status:

Those who personally benefit—the casino owners and those with a direct stake in selling casino games to the public or who think their taxes will be paid for them by the casino—are in favor. Those who are indifferent to gambling and ignorant of its social costs are neutral to mildly in favor since they believe they have no reason to prevent others their freedom of choice. Few are knowledgeable enough to understand what constitutes a theoretically valid cost-benefit review and sufficiently unprejudiced to pursue it.

III.   Jobs are Not A Benefit

The most common misconception about the social evaluation of gambling is the belief that counting jobs created by casinos is the way to measure benefits. Jobs are not a benefit, and more jobs in an area may even be harmful to existing residents. In other cases more jobs may be the means to benefits. In this section we discuss the connections between job creation and correctly counted costs and benefits. The concepts discussed are general; they apply to the evaluation of other businesses as well as casinos.

A.   Economic Development and The Creation of Wealth

A faulty emphasis on jobs derives from an incomplete understanding of economic development. To answer the question, "What is economic development?" recall what the creation of wealth is. When individuals undertake productive activity, they engage in the production of goods and services that provide greater welfare or satisfaction than the inputs used. Paint and canvas, for example, are re-arranged in the hands of a master painter into a work of art that has more value than the components had previously. A barber provides grooming that is more valuable to the customer than the value to the barber of the time given up. Consumer utility rises when activities are pursued and productive assets used in better ways. If society can re-organize so that someone is made better off without harming anyone in the process, the welfare of society is enhanced. Money and prices provide a convenient measure of the value of productive activity. When paint and canvas worth $100 dollars become a painting worth $10,000 a month later, the painter has generated income of $9,900 over that month.

Income is a flow per unit time, while wealth is a stock. Wealth is the claim to something of value. Income that has not been used for consumption can be used to acquire wealth. Claims to some assets have value to buyers because of expectations about how the assets will produce a flow of income in the future. When these expectations change, the value of the assets may change up or down, leading to capital gains or losses. With proper accounting for capital gains and losses, wealth is the accumulation of past unused (unconsumed) income.

Economic development is the creation of greater value by society. Greater value can result from a greater quantity of activity, activity that is more valuable, or both. Economic

development means greater income and wealth, which lead to greater utility for members of society. The following constructed examples show that job creation is neither necessary nor sufficient for economic development.

In the first example, let casinos be introduced into a community of 10,000 employed individuals. The casino causes the demise of a nearby racetrack and takes business from neighboring restaurants. The casino hires 100 employees, but these are matched by the loss of 100 jobs at other businesses, and casino revenues are matched by reduced revenues at these other businesses. The net effect is the enlargement of the casino sector matched by an equal shrinkage of the rest of the economy. In this example, no economic development takes place because greater value is not created. Casinos in this example act much like another restaurant might in a town with many existing restaurants. The new entrant takes business from others, shifting the location of activity but not increasing it.

From the first example one might conjecture that hiring by a new business need not indicate an increase in jobs and that the failure to create jobs means there is no economic development. It is true that hiring by a firm may not represent job creation. However, the next two examples show that economic development is not linked to job creation: Development may occur with or without a net increase in jobs.

In the second example, assume that casinos attract clientele from the surrounding areas. Local residents do not gamble. Casinos hire 100 new employees who move in from surrounding regions, paying them out of casino revenues earned from outside clientele. In this example, the noncasino local economy continues to employ 10,000 people, whose earnings are unchanged and who buy and sell as before at unchanged prices.

In this case regional net new jobs are created, but there is no economic development. The local economy is enlarged and employment rises 10 percent, but this enlargement provides no benefits to residents. Casinos operate like a toll house that uses the town as a platform for conducting its business. Money enters and money leaves. While total economic activity *in the vicinity of the town* rises, shifting the location of jobs without an increase in well being is not economic development, even though the local economy experiences enlargement. Viewed from the national perspective, this example could be consistent with casinos operating like restaurants of the first example: Increased employment in the casino sector is matched by reduced employment in other sectors. It is generally accepted, for example, that employment in Nevada is larger at the expense of lower employment in California, from where many Las Vegas clients come.

The third example shows that economic development can occur without job creation. Assume that casinos begin operation, hire 100 employees, but cause the number of jobs in other sectors to shrink to 9,900. Because gambling is so desirable to residents and outsiders alike, the casinos earn higher profits than other businesses in town and bid up the prevailing wage rate. Housing prices also rise due to the willingness of casino owners to pay higher prices. Residents are better off because they can gamble nearer to home than before and this provides them greater welfare, they receive higher wages for their labor which also makes

them better off, and their housing experiences capital gains. Because the work of the 100 casino sector employees generates greater profit than the profit lost from the businesses whose employment shrank, the total of wages and profits of all area business is higher. Casinos have brought economic development without new jobs.

In the first example, casinos did not increase jobs or provide economic development. In the second, casinos provided jobs but no economic development, while in the third, casinos provided economic development but no increase in jobs. What principle explains the different outcomes? Anything that increases the value of social product leading to greater welfare of residents is economic development and anything that does not is not. Job creation is immaterial unless it happens to be a vehicle for increase in social value.

The increase in social value gets distributed to society in different forms. It could appear as direct consumer benefits to households, such as closer access to an activity that was already available. It could appear in the form of better prices for consumers. We will call the former benefit distance consumer surplus, the latter, price consumer surplus. For example, a new firm that is located closer to the consumer provides distance consumer surplus. A firm whose entry into the market causes the price for its product to fall provides consumers with greater price consumer surplus. A new firm might cause wage rates to rise, also providing households with greater price consumer surplus, even though the consumer acts in the role of labor supplier. Economic development could appear in other forms as well, including higher profits to firm owners, greater taxes collected by government, and even improved functioning of markets. For example, the introduction of internet auctions such as eBay links markets, giving buyers lower prices and sellers higher prices for their goods. This also creates welfare.

Nowhere in the description of economic development was the creation of jobs part of the discussion. Jobs matter only in the sense that they proxy for one or more direct effects that benefit residents. Additional jobs in an area might not be associated with *any* benefits to residents or could even be associated with negative benefits. The point is that the benefit of an additional job to residents depends on specifics of the region and the case at hand. Using jobs as a proxy requires that the value of a job to residents be identified.

There is a close analogy between the construction of major league sports stadiums and social costs of gambling. In the case of major league teams, a community is usually told that a sports team will generate jobs, but the community must pay to build a sports stadium. In the case of gambling, a community is told that a casino will generate jobs, but the community must pay the social costs of casino gambling. Commenting on major league sports teams, Rappaport and Wilkerson (2001) write,

> The large public spending on sports facilities has been controversial. Usually these costly projects are justified by claims that hosting a sports franchise spurs local economic development by creating numerous new jobs and boosting local tax revenue. However, independent economic studies suggest that taxpayers may not be getting such a good deal.[5]

They go on,

> the impact studies almost always fail to measure benefits in a form that can be compared with public outlays....Correctly measuring the benefit from job creation requires both accurately accounting for the net number of new jobs associated with a team's presence along with *valuing the benefit of these jobs to the host metro area.*[6] [Emphasis added.]

Based on their review of the available research literature, Rappaport and Wilkerson conclude that the value of a job to the host area could be nothing at all! Or, it could be as much as $1,500 per job created, depending on circumstances. Or, jobs could provide *negative* value to the host area because housing is made less affordable, or traffic and other forms of congestion increase. "For some existing residents, the net result may be that they are hurt rather than helped by net job creation."[7]..."The ambiguity of whether a metro area benefits from net job creation sharply contrasts with the common perception that local net job creation is a benefit in and of itself."[8]

IV.   What Counts and How to Count It Right

The previous section tackled the prevalent confusion about job creation and economic development. In this section we provide a rigorously grounded formulation of the costs and benefits associated with the introduction of an industry such as casino gambling that imposes costs on society in the form of real-resource-using harmful externalities.

We base our approach to cost and benefits on the change in individual consumer utility, $u^1 - u^0$. Superscripts 0 and 1 identify pre- and post-change variables. Thus, u^0 refers to utility "before" (e.g. before casinos) and u^1 refers to utility "after." We assume that the individual's utility is a continuous function of the consumption of goods and services. With respect to casino gambling, utility also depends on the distance that the consumer has to travel to the nearest casino, the number of visits made, and the amount gambled per visit. The number of visits and the amount gambled are under the individual's control, but distance is taken as a given feature of the consuming environment, as are prices. Consumption is quantified in the vector $x \epsilon R^n$. The quantity of goods and services consumed appear as positive components of x, while the provision of a good or service such as labor supplied by the consumer, is shown by a negative component. Consumption is assumed to be locally nonsatiable. That is, for any x there exists a another vector near to x that is strictly preferred by the consumer.

Define $e(d, p, u)$ as the minimum expenditure needed to achieve utility u when distance to the nearest casino is d and prices are p. For fixed d and p, $e(d, p, u)$ rises and falls with u. In other words, $e(d, p, u^1) > e(d, p, u^0)$ if and only if $u^1 > u^0$. The welfare increase of individual i is therefore, $e_i(d_i, p, u_i^1) - e_i(d_i, p, u_i^0)$, measured in dollars, where the subscript i

reminds us which variables are specific to individual i. For all consumers welfare change is

$$\Delta W = \sum_i \left[e_i(d_i^1, p^1, u_i^1) - e_i(d_i^1, p^1, u_i^0) \right] . \tag{1}$$

Equation (1) treats a dollar of utility gain to one household as equal to a dollar of utility gain to another. This is a natural assumption and has a number of important implications[9] including that firm profits are equally important regardless of which firm generates them, and to whom they ultimately go. We assume that household i owns share θ_{ij} of firm j, where $\sum_i \theta_{ij} = 1$.

The economy's available consumption goods come from one of three sources: endowments Ω, current production y, or international trade z. Endowments are goods inherited from nature or the past. Without loss of generality, assume that households own the endowments, $\omega_i \in R_+^n$, where $\sum_i \omega_i = \Omega$, the economy endowment vector. The current production of firms y_j adds to the economy total $\sum_j y_j = y$. An input, say labor time or the services of physical capital, appear as elements of y_j with a negative sign, while outputs are positive elements of y_j. International trade is a form of production where exports, entering z as negative numbers, play the role of inputs, and imports, entering z as positive numbers, play the role of outputs.

Government is also an agent in the economy. Government collects tax revenues and spends them for the benefit of consumers. Although the accounting framework can be made to accomodate as detailed treatment of government as needed, we make the standard simplifying assumption that government returns to the household in lump-sum fashion tax dollars used for the purchase of goods and services that enter household utility. Households spend these transfers. The remaining government tax revenues pay for resources to deal with costly externalities. For example, if casinos increase crime, government might need to hire more police. If casinos create pathological gamblers, government might need to provide more treatment counselors. Goods and services, g, used to counter externalities do not directly affect household utility, but because they divert available resources from productive activity, their removal represents a drain on the economy. Tangible resources used is the social cost of externalities. Accounting in real terms requires

$$x + g = y + \Omega + z$$

where $x \equiv \sum_i x_i$ is aggregate consumption.

We assume that households are unconstrained in the long run in their purchase of goods and services. This implies that $p_i^1 \cdot x_i^1 = e_i(d_i^1, p_i^1, u_i^1)$ because an unconstrained consumer selects the least costly bundle for attaining a given utility u_i^1. In the initial situation, however, we allow for the possibility that the consumer may be constrained. If constraints are present, $p_i^0 \cdot x_i^0 > e_i(d_i^0, p_i^0, u_i^0)$. The most prominent example of a constraint is unemployment. If the consumer wants to work at the going wage, but is prevented, he is unemployed. We will return to unemployment as it relates to the effect of casinos below.

The following identity rewrites (1) as a telescoping sum where each term cancels part of the preceding term. It decomposes the change in welfare into interpretable components.

$$\sum_i \left[e_i(d_i^1, p_i^1, u_i^1) - e_i(d_i^1, p_i^1, u_i^0) \right] \quad = \quad \sum_i \left[p_i^1 \cdot x_i^1 - p_i^0 \cdot x_i^0 \right] \tag{2.1}$$

Income Effects

$$+ \sum_i \left[p_i^0 \cdot x_i^0 - e_i(d_i^0, p_i^0, u_i^0) \right] \tag{2.2}$$

Consumption Constraint Gains

$$+ \sum_i \left[e_i(d_i^0, p_i^0, u_i^0) - e_i(d_i^1, p_i^0, u_i^0) \right] \tag{2.3}$$

Distance Consumer Surplus

$$+ \sum_i \left[e_i(d_i^1, p_i^0, u_i^0) - e_i(d_i^1, p_i^1, u_i^0) \right] . \tag{2.4}$$

Price Consumer Surplus

To explain (2.1), make use of the budget identity

$$p_i \cdot x_i = \sum_j \theta_{ij} \Pi_j + p_\Omega \cdot \Omega_i + T_i - E_i \tag{3}$$

where Π_j is the profit of firm j, $p_\Omega \cdot \Omega_i$ is earnings from the consumer's endowment, T_i is household taxes, and E_i is the household's share of the cost of gambling-induced externality expenditures. Summing (3) over consumers and differencing between the initial and final situations breaks (2.1) into the following terms,

$$\sum_i \left[p_i^1 \cdot x_i^1 - p_i^0 \cdot x_i^0 \right] \quad = \quad \sum_j \Delta \Pi_j \quad + \quad \Delta p_\Omega \cdot \Omega \quad + \quad \Delta T \quad - \quad \Delta E. \tag{4}$$

$$\Delta \text{ Profits} \quad \text{Capital Gains} \quad \Delta \text{ Taxes} \quad \Delta \text{ Social Costs}$$

The change in firm profits, taxes, and social costs are self-explanatory. $\Delta p_\Omega \cdot \Omega$ is the value to the consumer of induced price changes—increases or decreases in the price of something the consumer owns such as housing—that affects consumer welfare. We characterize these as capital gains because they represent pure price effects.

The next component, (2.2), is the amount of money the individual would be willing to pay to remove the consumption constraints that are present, if any. If the constraint is unemployment, this is the value of reducing unemployment, for example. Expression

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(2.3) gives the value of having the nearest casino d_i^1 miles away compared to d_i^0 miles. Assuming that the consumer values gambling, the income needed to maintain original utility, $e_i(d_i^1, p_i^0, u_i^0)$, is smaller when $d_i^1 < d_i^0$. (2.3) represents the surplus accruing to the consumer when the nearest casino is closer. It is proper to interpret (2.3) as the amount of money the consumer would be willing to pay each year to have the nearest casino closer. Expression (2.4) is a conventional consumer surplus term. It is the amount of money that the consumer would be willing to pay each year for the opportunity to trade at prices p_i^1 instead of p_i^0. For example, if casinos cause the wage rate to rise, the consumer is better off by this price change and would be willing to pay amount (2.4) to have the higher wage prevail.

Using equation (4) with equations (1) and (2) gives:

$$
\begin{aligned}
\Delta W \;=\; & \Delta\text{Profits} + \Delta\text{Taxes} \\
& + \text{Distance Consumer Surplus} + \text{Price Consumer Surplus} \\
& + \text{Capital Gains} + \text{Consumption Constraint Gains} \\
& - \Delta\text{Social Costs}.
\end{aligned}
\tag{5}
$$

Equation (5) is the form we want. It lists all cost-benefit components, and, with equations (1)-(4), specifies how each term should be constructed. Nothing is left out and there is no double counting.

Economic development is synonymous with greater creation of social value. The decomposition in (5) identifies the ways in which this increased value is captured by agents in the economy. An increase in profits is the share of economic development that goes to the owners of firms. Since profits are summed over all firms, it is the net profit increase that matters to (5). The increase in taxes captures the portion of economic development that citizens collectively capture through government. Taxes are used for the public good, so higher tax collection summed over all payers, not just casinos, represent a public benefit. Better access to casinos is captured in the distance consumer surplus term, while the possibility that casinos cause prices to change in ways that favor residents is captured in the price consumer surplus and capital gains terms.

If the economy exhibits consumption constraints, and casinos are the cause of their elimination, then this also represents a benefit of casinos. It is theoretically possible that introducing casinos into the economy might reduce unemployment. The difficulty in propounding such a claim in practice, however, is that unemployment is generally understood to be a transitory phenomenon. The economy would eventually move to full employment without casinos. Comparing the final position of the economy with casinos to the final position of the economy without casinos would reveal no unemployment in either. Term (2.2) would then be zero. If one believes that casinos caused the *swifter* return to full employment, then during the period of transition this would be a temporary benefit of casinos. I am unaware of this argument being made and documented in practice.

The social costs of casinos are the cost of resources removed from other productive uses to deal with the social problems caused by casinos.

Nowhere in equation (5) do casino jobs or jobs created appear. Jobs matter only to the extent that they might be inputs to the creation of some other benefit identified in (5). Although the number of jobs sometimes is a good indicator of economic development, it is not always: The value of an additional job to an area may be zero, as documented in the literature on the job effects of major league sports teams, already discussed.

V.   The Bottom Line

The primary purpose of this paper was to correct misconceptions surrounding the evaluation of socially costly industries like gambling. A full scale treatment of the literature estimating the costs and benefits of gambling would require more space than can be devoted here. Nevertheless, we would be remiss to close without summarizing the essential numbers in a short précis. Details can be found in the growing body of research that addresses the costs, benefits and social implications of gambling, including Politzer, Morrow, Leavey (1981), Maryland Department of Health and Mental Hygiene (1990), Florida Executive Office of the Governor (1994), Kindt (1994a, 1994b, 1995, 1998, 2001), Thompson, Gazel, Rickman (1996), Lesieur (1998a, 1998b), Thompson, Gazel (1998), South Dakota Legislative Research Council (1998-99), Australia Productivity Commission (1999), National Gambling Impact Study Commission (1999), Ryan, Speyrer, Beal, Burckel, Cunningham, Scott, Wall, Westphal (1999), Gerstein, Murphy, Toxe, Volberg, Harwood, Tucker, Christiansen, Cummings, Sinclair (1999), Thompson, Quinn (1999), Grinols (1996, 1999), Grinols and Omorov (1996), Grinols and Mustard (2001a, 2001b), and Gazel, Rickman, Thompson (2001) among others.

There are two main ways in which gambling social costs have been estimated. One is by identifying the costs of problem and pathological gamblers and combining these numbers with estimates of problem and pathological gambler prevalence in the general population to infer the size of total costs. The second is through direct observations of the impact of casinos on selected variables such as crime rates. The approach based on problem and pathological gamblers is the more widely employed. Its advantage is that the required inputs are more readily accessible through sampling and survey techniques. Its disadvantage is that it understates social costs by failing to count costs that do not operate through problem and pathological gamblers.

A.   Direct Crime Cost Estimates

Direct estimates of the crime costs due to casinos, for example, has led to numbers that are similar to the crime cost estimates derived from the criminal activity of problem and pathological gamblers but they tend to be a little higher. Many experts believe that the

primary cause of increased crime observed in counties with casinos is due to problem and pathological gamblers. However, crimes could result in other ways, and tallying only crime due to P&P gamblers would understate the true amount of crime due to casinos. To directly estimate the amount of crime due to casinos, Grinols and Mustard (2001a) compiled data for every county in the Unites States for the twenty year period from 1977-96. Based on statistical analsysis they reported that 8 percent of observed crime in casino counties was due to the presence of the casino. They found that it generally takes 3 or 4 years after casino introduction before crime rates begin to rise. The cost of this crime was $63 per adult per year in casino counties. This is comparable to the results of a study by Thompson, Gazel, Rickman (1996) conducted in the state of Wisconsin. They reported that crime costs per additional problem gambler were $4,225, or 42 percent of the total costs found. On a per capita basis crime cost $57 per adult. Both figures are higher than the $46 estimate used in Table 1 below, derived from the crimes of problem and pathological gamblers alone.

B.   Costs Estimated From Problem and Pathological Gamblers

Pathological gambling is a recognized impulse control disorder of the Diagnostic and Statistical Manual (DSM-IV) of the American Psychiatric Association. Pathological gamblers experience repeated failures to resist the urge to gamble, lose control over their gambling, personal lives and employment, rely on others to relieve a desperate financial situation caused by gambling, commit illegal acts to finance gambling and engage in other characteristic behavior. Problem gamblers have similar problems, but to a lesser degree.

According to a 1990 Maryland Department of Health and Mental Hygiene survey 62 percent of problem gamblers in treatment had committed illegal acts as a result of their gambling, 80 percent had committed civil offenses, and 23 percent were charged with criminal offenses (Maryland, 1990). A similar study of nearly 400 members of Gamblers Anonymous showed that 57 percent admitted stealing to finance their gambling. On average they stole $135,000 each. Total theft was over $30 million (Lesieur, 1998b). The National Gambling Impact Study Commission's final report issued in June 1999 reported that among those who did not gamble (had not gambled in the past year) only 7 percent had ever been incarcerated. In contrast, more than three times this number (21.4 percent) of individuals who had been pathological gamblers at any point during their lifetime had been incarcerated.

By studying problem and pathological gamblers the resource burden to society of an additional pathological or problem gambler (some studies lump the two groups together) can be determined. There are at least nine distinct types of gambling social costs that have been identified:

1. **Crime** (apprehension, adjudication, incarceration and police costs),

2. **Business and employment costs** (lost productivity on the job, lost employment time, other costs to firms),

3. **Bankruptcy** (lawsuits and legal costs, bill collection costs),

4. **Suicide**,

5. **Illness** (costs associated with depression, stress-related illness, anxiety, cognitive distortions, cardio-vascular disorders, chronic or severe headaches among others),

6. **Social service costs** (treatment/therapy costs, welfare, food stamps, costs associated with unemployment),

7. **Government direct regulatory costs**,

8. **Family costs** (costs associated with divorce, separation, spousal abuse, child neglect),

9. **Abused dollars** (resources acquired from family, friends, employers under false pretenses).

Averaging the results of eight studies conducted between 1994-99 that contain original research on one or more of the nine social costs[10] resulted in the following estimates of the costs to society per additional pathological gambler[11]: Crime–$3998, Business and employment costs–$3995, Bankruptcy–$316, Suicide–Not estimated, Illness–$700, Social Service Costs–$631, Government regulatory costs–Not estimated, Family Costs–$111, Abused dollars–$3834. The total was $13,586. The comparable totals for problem gamblers based on two studies (Gerstein et al. (1999) and SD Legislative Research Council (1998-99)) are Business and employment costs–$200, Social Service Costs–$712. No other categories of costs are available. The total for those costs that were estimated was $912.

Based on a meta-study of others' field research, Shaffer *et al.* (1997), estimated that pathological gamblers were 1.4 percent of the population and problem gamblers 2.8 percent. 95 percent confidence intervals for the percentage of pathological gamblers in the population were 0.90-1.38 %, and for problem gamblers 1.95-3.65 %. For an average 100 adults, these numbers imply social costs of $14,006-$22,077, depending whether one uses both lower bounds or both higher bounds. On a per capita basis, the range is $140-221. For the nation as a whole, social costs for 197.5 million adults would be $27.6-43.7 billion. This places gambling among the handful of social problems such as drugs and alcohol that impose substantial costs on society, including on those who do not engage in the activity.

Fewer estimates of the benefits of casinos exist. Grinols (1999) reports distance consumer surplus as between $34-50 per adult, depending on whether one adjusts for the demand of problem and pathological gamblers or not. How the other benefits of casinos are distributed depends on the market structure and the casino tax rate. In the case where entry is free to any casino firm meeting the licensing standards, as in Nevada and some other places like the Gulf Coast of Mississippi, casinos exert no monopoly power and profits, through competition, are driven down to the ordinary business level. In the case where casinos are taxed at the

Table 1: **Summary of Per Capita Casino Costs and Benefits**

BENEFITS		
Net Increase in Business Profits	$0	
Net Increase in Tax Collections	$0	
Distance Consumer Surplus for Non-Problem, Non-Pathological Gamblers	$34	
		$34
COSTS		
Crime	$46	
Bus. & Employment	$51	
Bankruptcy	$4	
Suicide	$??	
Illness	$8	
Social Svcs.	$27	
Direct Regulatory	$10	
Family Costs	$1	
Abused Dollars	$44	
		$190
NET SOCIAL COST		**-$156**

same rates as other business, the increase in casino taxes is matched by comparable drop in taxes collected from businesses competing for the same dollars. In this case, the benefits of casinos in society accrue entirely to consumers in the form of distance surplus. The net change in profits plus taxes measured over all business is zero. These gains are conceptually easiest to identify and estimate. We report them in Table 1 using cost figures in the middle of the estimated range. When casinos are granted regional monopoly licenses, as in the case of states like Illinois, some of the benefits of casinos are captured by casinos in the form of monopoly profits. The increase in profits of business reduces the benefits that end up in the hands of consumers. The net increase in profits to all business are harder to estimate for a number of reasons, including the fact that American Indian casinos are not required to report their profits. Similarly, if government levies heavier taxes on casinos than other businesses, some of the benefits of casinos are captured by government, at the expense of benefits that would have accrued to the casinos and consumers directly.

Based on the costs and benefits in Table 1 the social costs outweigh benefits by a factor of $190 to $34 or 5.6 to 1. An economy that includes casino gambling is worse off by $156 per capita compared to the same economy where casino gambling is prohibited. These figures do

not yet include any capital gains or price-related benefits of casinos. Following the literature on the benefits of major league sports teams, let us assume, therefore, that additional jobs due to casinos are associated with $750 in capital gains and price-related benefits to residents. $750 is the mid-point of the $0-1,500 range identified earlier. Would these benefits change the unfavorable cost to benefit ratio?

The answer is probably not. To overcome the benefit-cost deficit in Table 1 through job creation would require 21 new jobs for every 100 adults in the population. Since labor force participation in the US is 67 percent, this means that casinos would have to cause the labor force to increase by 31 percent. Such a large increase is extremely unlikely.

The conclusion is inescapable: Based on the numbers currently available, casino gambling fails a theoretically grounded, theoretically valid cost-benefit analysis.

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