

MEASURING THE IMPACT OF CASINO PROCEEDS ON TOTAL PER PUPIL EXPENDITURES FOR EDUCATION IN MISSISSIPPI

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ABSTRACT. The Mississippi Legislature adopted casino gaming in 1990 for the purpose of curing financial ills that have long plagued the Magnolia state. Local policy makers were given the opportunity to tax the casino industry at 3.2 percent of gaming wins, with an additional .8 percent if these local government stakeholders deemed it necessary to extract additional supplemental revenue from the casino industry. One program designated as a beneficiary of this revenue-generating source was education. This paper borrows research techniques from the lottery literature in an effort to measure the impact of casino gaming dollars on per pupil spending in Mississippi. The conclusions reached by this research suggests that the thirteen school districts receiving casino proceeds for education are significantly benefiting from this supplemental source of revenue.

INTRODUCTION

A revitalization of Mississippi's economy occurred in 1990 with the passage of the Mississippi Gaming Control Act, which authorized riverboat casino gaming in certain local communities that chose to adopt this revenue-generating device (Rivenbark, 1997). During the 1980s, Mississippi was faced with severe budgetary hardships, due to the collapse of the oil industry. Operating a mere \$2 billion, policy makers

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in Mississippi were forced to slash many governmental programs and reduce the number of many other services. The one program that received the largest cut was education. Because of Mississippi's traditional lag in per pupil expenditures compared to other states, policy makers viewed additional supplemental revenue from casinos as a possible panacea for alleviating this legendary funding problem (Oliver, 1995). This research fills a gap in the existing literature because no other quantitative empirical study deals specifically with the impact of casino dollars on education. The following question is addressed by this research: *Do revenue and spending patterns differ in school districts with casino tax revenue, compared to matching school districts without casino revenue? If so, what educational outputs may be related to funding?*

LITERATURE REVIEW

State Supported Gaming in America

Public administrators and political functionaries, in Mississippi and other American states, experienced a most intense and challenging decade during the 1990s. State governments witnessed a tremendous increase in demands on their governmental services, and an unprecedented number of un-funded mandates from the federal government, along with a tax- payer revolt (Ryen, 1992). As the demand for social intervention programs increased, and the amount of available resources for funding these programs decreased, governmental officials used their ingenuity in generating revenue to offset the cost of running government. "Games of chance," in one variation or another were the revenue generating mechanisms chosen by many state governments as their "economic savior" (Rivenbark & Rounsaville, 1995).

One of the primary arguments used to rally support for legalized gambling is spending more revenue on per pupil expenditures. In theory, these government officials asked the populace to invest in the future of their community and country by using gambling dollars to educate the younger generations.

State Operated Lotteries

Lotteries have proven to be appealing mechanisms for producing government revenue because they are considered a voluntary tax: individuals play lotteries because they want to, instead of having to pay tax because the government demands it (Mikesell, 2001). The voluntary

aspects of lotteries are extremely appealing to governors and legislators because resources for programs are generated without unpopular tax increases. In other words, legalized gambling intends to raise revenues without increasing the tax burdens of the lower class (Mikesell, 1989).

The most popular gambling device today is the lottery (Mikesell & Zorn, 1986). The allure of lotteries and other forms of gambling as a source of revenue enhancement for state and local governments ascribes amply to the continued emergence of legalized gambling over the past two decades. Currently, thirty-eight states and the District of Columbia operate lotteries (National Gambling Impact Study Commission, 2000). From 1982 to 1990, expenditures on legalized gaming increased at almost two times the rate of income; and by 1992, revenues from state sanctioned gambling operations averaged approximately \$30 billion a year (Gross, 1998).

While lotteries are touted by many as a means of increasing funds for state programs, opponents contend that lotteries are not the economic savior that policy makers and voters originally thought (Jones & Amalfitano, 1995). Miller and Pierce (1997) examined the financial aspects of education lottery's short-term and long-term effects. They found that state-sponsored lotteries increased spending on education per capita during the early years of the lottery, but as time passed, these same states witnessed an overall decrease in spending for education.

The second major problem with lotteries funding education is the idea of fungibility. Spindler (1995) reinforces the notion of fungibility in reference to lottery dollars for education. Spindler examines the lotteries of New York, New Hampshire, Ohio, Michigan, California, and Montana to determine their impact on educational revenue enhancement of public education expenditures. Spindler attributes the issue of fungibility to the "politics of the budgetary process" because education expenditures are highly visible to the public, and are plagued with fiscal and political restraints (p. 60). Spindler contends that in states where lottery revenues are earmarked for education, revenues actually substitute for general fund expenditures. Hence, Spindler concludes by postulating that state lotteries "are robbing Peter to pay Paul" (p. 61).

Fields (1996) supports Spindler's notion, and contends that the failure of Florida's lottery in meeting everyone's expectations of success expounds on the limitations of this revenue enhancing device. He points out that even though Florida's educational system has received billions

of dollars from lottery proceeds, the state legislature has taken non-lottery monies previously designated for education, and used them for funding other state commitments. Public education's share of the state budget in Florida has decreased more than 5 percent over the past decade since the lottery began in 1986 (National Education Association, 1997). Even though revenues from lottery sales were intended to enhance the state's educational system, the legislature was not legally bound to boost education with these proceeds. As a result, the earmarking of revenues from lotteries to replace regular, budgeted educational funds, instead of enhancing education, detracts from Florida's education policy.

A third major problem with lotteries occurs when the proceeds are used to finance a tax cut. Lotteries have proven to be appealing mechanisms for producing revenue because they are considered a voluntary tax. The voluntary aspects of lotteries are extremely appealing to governors and legislators because resources for social intervention programs are generated without unpopular tax increases, and in some cases tax cuts occur because a surplus of revenue exists from the lottery (Rubin, 1993).

Lotteries might be quite appealing to governors and legislators in their reelection bids for office. Rodgers and Stuart (1995, p. 244) stipulate that "the revival of lotteries," despite concerns about immorality and "negative distributional effects," has occurred because of the belief that lotteries, instead of other tax instruments, raise additional revenue by generating smaller efficiency losses than other taxes; therefore, lotteries are less painful to voters. In turn, political leaders may endorse tax cuts and replace the lost revenue with lottery dollars.

Casino Gaming

A second type of gambling device that is receiving attention among governmental policy makers as a supplemental source of revenue is casino gaming. Since the precursor to casino gaming is state-sponsored lotteries, and lotteries are receiving mixed emotions towards their impact on education, casinos must also be addressed and evaluated to determine if they are having the financial impacts on education as originally envisioned by policymakers.

According to Franckiewicz (1993), ten states have supported casino gaming as a supplemental revenue-generating device. They are: Colorado, Illinois, Iowa, Louisiana, Mississippi, Missouri, Montana,

Nevada, New Jersey, and South Dakota. Recently, the states of Michigan and Indiana have also adopted casino gambling bringing the total twelve states utilizing this revenue generating device to pay the expense of operating government (National Gambling Impact Study Commission, 2000). Recent scholarly endeavors measuring the economic impacts of casino gaming include *economic development* (Oliver, 1995; Perniciaro, 1995; Mason & Stranahan, 1996), *marketing and tourism* (Denise von Herrman, Ingram & Smith, 2000), *municipal revenues* (Clynch & Rivenbark, 1995; Clynch & Kaatz, 1999), and *taxation* (Rivenbark & Rounsville, 1995; Rivenbark, 1997).

Casino Gaming In Mississippi

Due to the collapse of the oil industry in Mississippi, concerned citizens in Vicksburg, Mississippi, consulted their state Senator (Bob Dearing) about the possibility of bringing casino gaming to Mississippi. Despite the rejection of lottery legislation just a few months earlier casino legislation was authored by Representative Montgomery in the House of Representatives while Senators Dearing and Gallot co-authored a similar bill in the Senate. The House bill passed with limited resistance, but after heated debate among policymakers in the Senate, the upper house ratified the legislation by a vote of 22 – 20 (eight Senators reframed from voting on the bill).

Casino gaming in Mississippi was passed with the stipulation that only counties bordering water ways (the Gulf Coast and Mississippi River) were allowed to vote to adopt this revenue-generating device. Once the county had adopted casino legislation, each municipality located in the county would have the opportunity to vote on the casino bill. Originally fourteen counties voted on the bill and eight of those counties chose to bring casino gaming to their respected community. Currently, 30 casinos are located in eight counties throughout Mississippi (the Choctaw casino in Philadelphia, MS was excluded from this figure because it is on Naïve American land and is not taxed by the state) (“Mississippi Gaming Control Act,” 1990).

Mississippi casino tax has included 8 percent of gross revenues for the state, with an additional 3.2 and .8 percent of gross revenues for local governments. Towns and municipalities may levy a .8 percent gaming tax on casinos residing within the entity’s corporate limits, and counties are allowed to collect taxes from facilities operating in unincorporated

areas. Taxes paid by gaming facilities located in municipalities are divided between the city and the county, with the city's share equivalent to the percentage of the county residents living within the city limits. The statute does not require county governments to share revenues with cities that have casinos residing in unincorporated areas. Overall, the casino industry is taxed at 12 percent by state and local governmental entities. The states' portion of the proceeds (8%), is placed into the general operating fund, while local communities are given the opportunity to disburse the proceeds in the manner they deem fit ("Mississippi Gaming Control Act," 1990).

Overall, practitioners throughout Mississippi attribute Mississippi's recent economic success to the gaming industry (Stanley, 2001). For example, from 1992 to 1997, the assessed value of property in Tunica County rose from \$16.1 million to \$566.1 million. As a result, the school millage rate declined from 11.4 cents per \$1,000 assessed value to 4.2 cents per \$1,000. In other words, the tax bill on an \$80,000 home dropped from \$912.08 to \$338.40 in five years (Mississippi Gaming Commission, 2000). However, researchers have yet to produce any empirical studies measuring the impact of casino gaming on education in Mississippi.

The Rationale for a Casino Study

In theory, Scholars such as Mikesell (1989), Spindler (1995), Miller and Pierce (1997), have measured the impact of state operated lotteries on funding education in the American states. The conclusions reported by all of these scholars indicate that lotteries are an enormous "hoax", because hardly any of the proceeds from taxes received from lotteries are used to enhance education. Operating state lotteries is expensive, and usually much of the tax revenue generated by lotteries is used to cover administrative costs. Despite these empirical results, 38 states and the District of Columbia now operate lotteries with a large portion of the proceeds earmarked for education. The growth of casino gaming in American is related to the perception that this gaming device will also provide additional revenue for such programs as education.

As the literature suggests, earmarking lottery and casino gaming funds for education is popular among policy makers because almost everyone supports better education, despite the empirical support for such an accusation. However, policy makers in Mississippi sold the idea

of casinos in many municipalities and counties by earmarking casino funds for education (Rivenbark, 1997). If casino revenue is impacting per pupil expenditures in Mississippi school districts with casinos, in theory, casino school districts should be spending more on per pupil expenditures, compared to matching noncasino school districts. This research intends to fill the literary gap by addressing the following research question and hypothesis:

Research Question: Do revenue and spending patterns differ in school districts with casino tax revenue from similar school districts without casino revenue?

Hypothesis: School districts receiving casino revenue tend to spend the same on per pupil education expenses, compared to matching school districts without casinos.

DATA AND METHODOLOGY

Conceptual and Operational Definitions

The following section of this manuscript lists the conceptual and operational definitions of the variables used in this study.

Conceptual Definitions:

Local Spending per Pupil by School District (Dependent Variable) – the amount of spending per pupil by local governments.

Casino Tax Revenue - the amount of revenue casino school districts in Mississippi receive from the gaming tax placed on casinos.

Per Pupil Assessment Value – Average per Pupil Assessment Value based on Average Daily Student Attendance (measured in \$100 thousand).¹

Number of Students - the number of students in each Mississippi school district.

Millage Rates – the percentage of taxable income levied on real and personal property in each Mississippi school district.

Casino Presence – Dummy variable coded 0 = casino school districts; 1 = Non-casino school districts.

Education Spending Over Time Lagged One Year – Independent Variable Accounting For Education Spending Over Time (In the

statistical tests using per pupil assessment value as the dependent variable, the *target variable* is the independent variable accounting for per pupil assessment value in Mississippi school districts with and without casino gaming, over time).

Unemployment Rates – Unemployment rates in school districts used as a proximity variable to test casino tax revenue's impact on per pupil assessment value. It is measured in terms of county data.

The model tested in this research project for empirical results using pooled time series analysis are total spending on per pupil expenditures for education. The time frame used in this analysis is eleven years: 1989/1990 –1999/2000 school years.

Operational Definitions

Local Spending Per Pupil by School District – Mississippi State Superintendent's Report on Education.

Casino Tax Revenue – Mississippi Department of Education, total casino spending on education.

Per Pupil Assessment Values – Mississippi Report Card on Education, Mississippi Department of Education.

Number of Students – Mississippi Statistical Abstracts, Mississippi State University.

Millage Rates - Mississippi State Superintendent's Report on Education.

Education Spending – Target variables were computed for each dependent variable in the regression analyses to account for changes in the dependent variable over time. The following are the target variables used in the regression models of this research project: spending for education, local government spending for education, and assessed value based on average daily attendance of students.

The pooled time series cross-sectional regression equation, as a formal model tested in this research project, is as follows:

$$Y = a + (b_1)X_{1,t-1} + (b_2)X_{2,t-1} + (b_3)X_{3,t-1} + (b_4)X_{4,t-1} + (b_5)X_{5,t-1} + (b_6)X_6 + E$$

Where:

Y = Total spending for education;

X1 = Casino;

X2 = Per pupil assessment;

- X3 = Total number of school students
 X4 = Millage;
 X5 = Total Education spending (counter variable)
 X6 = Casino presence; and
 E = Dummy variable.

This research project uses “pooled time series cross-sectional data analysis” as the measuring device for the previously stated hypothesis (Beck & Katz, 1996, p. 1). One of the most promising advantages of using pooled time series cross sectional analysis is its ability in offering explanations of the past, while simultaneously predicting the future behavior of exogenous variables in relation to endogenous variables. Pooled time series cross-sectional regression analysis allows the researcher to focus on more than one case in predicting social phenomenon, whereas simple time series analysis strictly deals with specific cases at different time points causing data management complications, while also being costly and time consuming. Furthermore, ARIMA time-series methods of data analysis place an overwhelming emphasis on the burden of controlling for autocorrelation and heteroskedasticity to ensure data dependability. Autocorrelation and heteroskedasticity do pose threats to data analysis, however, according to Beck and Katz (1996, p. 3) they are more of a “nuisance” than a real threat.

The accuracy of the regression model is inevitably measured by the error term. Hence, if the standard error is small, then all of the sample estimates based on the sample size tend to be similar and considered representative of the population parameters. The exact opposite is true if the error term is large; then the statistics fail to represent the population parameters. Of the previously mentioned assumptions, the error term corresponding to different points in time failing to correlate is the most important assumption violation. When the observations from different points in time are correlated, one of the assumptions is violated, usually the latter one. When this violation occurs autocorrelation is present, creating estimators that negate true representation of social phenomenon.

Autocorrelation violates an assumption of the regression model that the residuals are independent of one another. Its presence affects the accuracy of the error term, which biases the model’s t-ratios and the confidence limit. Autocorrelation may be eliminated from a research project by identifying and including an independent dummy variable²

that explains part of the unexplained variance. Beck and Katz (1996) address the issue of autocorrelation by calling it more of a nuisance than a real problem. They contend that lagging the endogenous variable(s) will assist in controlling for serial correlation. A lagged regression model relates a current endogenous variable to past values of the exogenous and endogenous variables reducing the risk of autocorrelation. The Durbin-Watson M was reviewed to ensure that autocorrelation was not a problem in the data set (Durbin, 1970).

A second major methodological problem with pooled time series cross-sectional data analysis is heteroskedasticity. In pooled data, some units, for a variety of reasons, are inherently more various than others at all times. Such differential variability is usually of modest concern in un-pooled data because it affects only a single case at a time. In pooled data, however, it is likely to inflict a larger amount of harm to data sets. For instance, basic size differences between units are one such endemic source of heterogeneity. To account for the differences among states, intercepts for the cross-sectional unit are employed. On the reasonable assumption that variation is roughly a fixed proportion of size, analysis of units of substantially different sizes induces heteroskedasticity in any regression. But the problem can take on considerable proportion that causes concern when each cross section consists of T cases in time. Therefore, the size problem of the sample can be reduced by standardizing the data set (Beck & Katz, 1995). The emphasis of this study is concerned more with changes across time rather than across school districts because as the t -test will suggest (later in the study) that virtually no difference exists between the experimental and control groups used in this study. White's (1980) test for heteroskedasticity was consulted, and the statistic suggested that this methodological nuisance was not a problem in the data set.

The variance inflationary factor (VIF) checks for multicollinearity among the variables (a situation in the data set where two or more variables are highly correlated) in the regression equation. Instead of, however, accepting the validity of this statistic on the assumption that SPSS is right, measures were taken to test for this statistical problem. All the variables in the equation were regressed against one another to ensure that, according to Fox (1991), no variables indicated a VIF of 5.6 or more. Furthermore, the tolerance levels were reviewed and no variables reported levels below .9. Therefore, multicollinearity was not considered a problem in the data set.

Units of Analysis

According to the Mississippi Gaming Commission (2000), 1993 was the first year that casinos began contributing revenues to state and local governments. However, according to the Mississippi Department of Education (2000) the first casino dollars used to fund education did not come until 1995. Thirteen school districts currently benefit from casino gaming in Mississippi. However, to measure the impact of casino dollars on education, a comparable comparison group was established. Twenty-six school districts were chosen as the units of analysis in this project (thirteen casino school districts compared to thirteen matching non-casino school districts).

The comparison groups were chosen premised on previous studies conducted by the Mississippi Department of Education.³ These studies utilized a process for choosing comparison groups based on approximation ranges in the number of students in each school district, spending on education per pupil, and per pupil assessment values by each school district. The range categories used in selecting the comparison groups were as follows: 1000 – 15,000 for number of students, \$2,500 to \$5,000 for per pupil expenditures, and \$10,000 – \$50,000 for the assessment value of each school district.

In Table 2, an independent samples t-test was conducted on the data set for 1994 (year before casino proceeds impacted per pupil spending on education in Mississippi) to measure the difference in per pupil spending between the casino school districts and matching non-casino school districts. The following table reports the findings of the independent sample t-test.

TABLE 2
Preliminary Comparative Means Test on Per Pupil Spending for Education: 1989 – 1994

	Dummy	Mean	St.D.	T - Score	p.>
Total Education Spending	.00	3651	396.08	.905	.367
Number of Students	.00	5117	3120.43	.016	.987
Assessment Value	.00	24355	8727.492	-.307	.760

Notes:

0 = Casino School Districts before Casino Gaming;

1 = Non-Casino School Districts before Casino Gaming.

The independent samples means test analysis demonstrates that the differences between the casino school districts and comparison groups used in the study were virtually the same before casino gaming proceeds were spent on education by Mississippi. For instance, casino school districts spent around \$3,651 per pupil for education and non-casino school districts spent \$3,588 per pupil. This statistical report is important because it lays the foundation of the study by suggesting that the casino school districts and matching non-casino school districts reported no statistically significant differences in per pupil spending on education before casino gaming came to Mississippi, suggesting that the units of analysis used in the data set were comparable.

TABLE 3
Total per Pupil Spending on Education in All School Districts
Pooled Time Series Model One, 1989 – 1999 (N = 286)

	B	St.E	Beta	T	p<.05
Constant Variables	118.261	114.557		1.032	.303
Casino Tax Revenue	.648	.281	.052	2.307	.022
# of Students	-.00489	.006	-.016	-.802	.423
Millage Rate	-.207	1.586	-.003	-.130	.896
Assessment Value	35.171	19.210	.045	1.831	.068
Education Spending _{t-1}	1.018	.027	.899	37.593	.001
Casino Presence	-12.952	38.534	-.007	-.336	.737
<i>R</i> .951	<i>R</i> ² .904	<i>Adj.R</i> ² .902	Df 6	F 440.1	p<.001

The results for the regression equation measuring the amount of total spending for each school district in Mississippi from 1989/1990 through 1999/2000 school years display the following results. The statistics from the F-test of 440.189, with a significance of .001, indicates that a strong difference exists between the seven independent variables and the one dependent variable. The adjusted R^2 of .902 suggests that the model is explaining a large amount of the variance occurring in the equations between the variables (90%). The overall statistics reported in the model tend to suggest that the regression equation is valid and reliable for explaining the social phenomenon in the data set.

The casino tax revenue variables B of .052, signifies it as being a valid predictor in the regression model. The casino tax revenue variable signifies that a positive difference is occurring between the seven independent variables and the one dependent variable. Therefore, for

every unit increase in casino revenue an increase of .648 will occur in total spending on education in Mississippi school districts with casinos. Although the casino tax revenue variable signifies a statistical relationship, the casino presence variable does not. The inverse relationship of the variable is indicative of what was expected, despite the absence of a significant $p >$.

The null hypothesis is rejected. The pooled time series cross-sectional regression analysis suggests that all the casino school districts in Mississippi are benefiting from this supplemental source of revenue for per pupil expenditures.

CONCLUSION

In essence, the statistical information suggests that four casino school districts in Mississippi have increased the amount of per pupil expenditures, compared to matching non-casino school districts. Statistics are good for generalizing to the larger community and for understanding the holistic aspects of the findings as a whole, but the problem with relying predominantly on statistical inferences is that statistics fail to provide the reader with specific case in point examples of how the revenue is being spent on education in Mississippi. For instance, are these four school districts spending the money on computers, buildings, or the salaries of teachers? Furthermore, if these four school districts are benefiting from this supplemental source of revenues, have overall test scores improved in these four school districts? Future research in this area should focus on how the casino proceeds are being spent by casino school districts in order to answer the big question: Is education improving as a result of casino gaming proceeds, especially in Mississippi? The utilization of case studies will assist the researcher in addressing this research question.

NOTES

1. However, due to the absence of a law stipulating the timing that school districts must re-assess land, the results of these statistical tests may be skewed. Timing means that after 1992 school districts must re-assess 25 percent of their land every four years according to Mississippi law. Prior to the passage of this law, reassessment was not a requirement for local governments in Mississippi.

2. The dummy variable incorporated in this study is casino presence coded 0 = casino school districts and 1 = noncasino school districts.
3. Charles Shivers, Director of Financial Accountability, Mississippi Department of Education and Dr. Gary Johnson professor of Educational Leadership at Mississippi State University stipulate that the Mississippi Department of Education has used the following indicators in the past to determine comparative school districts in various educational finance studies: average daily attendance, 1st month enrollment, property per pupil assessment values, whether the districts have 16th section trust lands, whether they are municipal or county districts, or rural or urban, per pupil spending, and total federal spending. Mr. Shivers endorses the indicators (population, per pupil assessment value and spending per pupil) utilized in this study for generating the comparative school districts that were studied (Charles L. Shivers, CPA, personal communication, January 9, 2001; Dr. Gary Johnson, personal communication, January 8, 2001). See the Mississippi Department of Education (2000).

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