An Empirical Assessment Of Lottery Proceeds On Education In The American States

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Abstract

State operated lotteries have recently been classified as panaceas for eradicating revenue disparities existing across public school districts in the American states. The research question posed in this study is as follows: are state operated lotteries impacting per pupil expenditures in the American states? The purpose of this research project is to empirically confirm these accusations for attributing credibility to this revenue-generating device because educational disparity portrays a grave injustice in the United States. Pooled time series cross sectional regression analysis is the methodological mechanism employed to test the data in this research project. This study suggests that state operated lotteries are not having the financial impact on education many practitioners and scholars originally anticipated.

INTRODUCTION

Numerous studies representing the positive and negative aspects of gaming and the damaging social implications of these revenue-enhancing programs permeate the academic literature on state-sponsored lotteries. This examination differs from other evaluations of lotteries because the project assesses the impact of lottery contributions to public education in the American states over a period of time. Currently thirty-eight states and the District of Columbia have lotteries. In their ploy for getting lotteries adopted many policymakers argued that a lottery would generate a source of supplemental revenue for state and local governments. In many cases, the program used to specifically sell the lottery is education. Policy makers felt that since the perception of residence in many states is that adequately funded education programs will provide their children with a means toward a better future. In essence, voters supported state sponsored lotteries because they were lead to believe that the additional supplemental revenue
generated by this gaming device will result in better education for their children. Bracy (1995) stipulates that on average, lotteries account for about 3.8 percent of state education expenditures, but in some states, the figure is 2.0 percent and even lower. Since the implementation of state-sponsored lotteries across the American states, have substantial increases in public education expenditures occurred? The absence of empirical research assessing the impact of lotteries on public educational funds over a period of time, in addition to predicting the future impact of lotteries on education, contributes to the necessity of this project.

The following section of this research project incorporates a literature review that assesses recent arguments regarding lotteries and their use for enhancing public education expenditures. A methodology and data section that addresses the specific methods used in testing the stated hypotheses, in addition to the findings and conclusions of this research project, compose the latter sections of this document.

LITERATURE REVIEW

When American society embraced the concept of educating its citizenry, local public school districts began emerging across the nation. Education was a means of socializing citizens to embrace the norms, values, and customs of a society; and, policy makers felt that the only method to obtain universal support for this social intervention program was to permit local governments to control education (Odden and Picus, 1992). In their view, control meant allowing local governments to fund education through various means and dictate what each student would learn in the classroom (Grissmer, Flanagan, and Williamson, 1997). The mechanism initially chosen to fund education at the local level was the property tax. However, policy-makers soon discovered that the property tax was an inadequate means of providing
efficient and effective education to all American students because some districts were receiving more revenue for education when compared to others (Lewis and Maruna, 1996). More affluent societies received more revenue from property taxes; therefore, schools in these districts were able to create learning environments that were more advanced when compared to other less affluent schools across town. To cope with the inadequacies of funding formulas for education, along with president Reagan’s push for more state control of education in the 1980s, policy makers sought the assistance of a an alternative revenue-generating device that may provide additional revenue to offset the decline in per pupil expenditures being witnessed by almost every American state (Odden and Picus, 1992). Although possible gaming revenues were not panaceas for eradicating per pupil funding disparities, many states looked towards the lottery as a possible source of supplemental revenue for assisting in state governments largest policy expense-education (Miller and Pierce, 1997). Some scholars suggest that policy makers sold the issue of the lottery as an economic savior for education, without ever attending to increase educational expenditures with this supplemental source of revenue (Hanushek, )

Hanushek contends that graduation rates have increased in the last thirty years, while test scores have remained about the same. Furthermore, the graduation rates among women and blacks have significantly increased. The author stipulates that since 1970, real education expenditures (those adjusted for inflation) have increased yet measures of performance have stayed roughly the same. “Where is the money going,” is the question posed by this scholar. In theory, state-sponsored lotteries would provide additional revenue for education in an effort to improve student performance. However, in many states political and administrative leaders would replace previously funded education dollars allocated by the general assembly, with
lottery dollars. In turn, policy makers would designate the replaced education dollars into other programs that were under funded (public transportation and public safety), and in some cases even create new programs with these additional revenues (providing cheaper prescription drugs for the elderly)(Spindler, 1995). The economic literature refers to this process as “fungibility,” and may be one of the leading causes for the stagnation in student performance that is occurring in America (Hanushek, ).

Due to the existence of outdated funding formulas and fungibility, the funding inadequacies for education continue to exist. For example, in the 1995-96 school year, public schools spent an average $6,855 per pupil (in constant 1998 dollars). In this same school year, relatively high wealth school districts (those with a median household income of $35,000 or more) spent more per pupil than school districts with less wealth (Department of Education, 2000). Elementary and secondary education expenses currently consume nearly a quarter of the average state budget, and post-secondary schools account for another 12 percent of state budgets (Wong, 2000). According to the National Center for Education Statistics (1999), education accounts for the single largest expense in most state and local governmental operating budgets. In the educational year of 1992-93, expenditures were estimated at more than $375 billion for all public schools and colleges.

Various scholars argue that the American education system is under-funded (Picus, 1995), while others contend that this funding disparity is not the major problem with America’s education system. For instance, Tierney (2000) contends that the sole problem with education is the curriculum. This author suggests that, no matter how much money is spent on education, if the curriculum is not changed, America’s system of education will continue to decline. Picus
(1995) argues that a lack of funding has contributed to the curriculum problem in American schools. This shortage of revenues does not allow school districts to receive the materials and training that are necessary to provide quality education. Hence, Picus (1995) determines that education funding is the most important policy problem facing governmental and educational administrative officials today.

As revenues decline due to taxpayer revolts across the nation and demands on government services increase especially in education, state and local governments must focus on receiving the most “bang for their bucks” (Ryen, 1992). Public administrators and political functionaries, in the American states have endured one of the most intense and challenging decades during the 1990s. State governments have experienced a tremendous increase in demands on 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 has increased and the amount of available resources for funding these programs has decreased, governmental officials are left using their ingenuity in generating revenue, which would provide additional funding to pay the cost of running government and its policies and programs. “Games of chance,” in one variation or another have been chosen by many state governments as their “economic savior” (Rivenbark and Rounsaville, 1995: p.3).

One of the primary arguments used to rally support for legalized gambling has been education finance. Numerous political and appointed bureaucratic functionaries stipulate that legalized gambling, in the form of lotteries, casinos, or other types of gambling, will generate enough revenue to significantly enhance education revenue. In theory, these government officials ask the populace to invest in the future of their community and country by using
gambling dollars to educate the younger generations. The basic premise of their argument is that the education system in America is lagging behind most countries, and the only way America is going to compete in the global economy is by investing in the education of its children. They paint a desperate picture that some sort of gaming device must be adopted in order to allow our children a chance for survival in the newly emerging global economy. Many proponents of legalized gambling believe that the education system in America has traditionally been under-funded, and they view legalized gambling as a means to end this disparity. Others contend that under-funding in education is a result of the formulas used by states in determining “who gets what, how and why” in financing education (Dye, 1995; Alexander and Salmon, 1995).

As previously noted, legalized gambling is a mechanism often used by policy makers to offset the cost of education for taxpayers. The most popular form utilized is the lottery, and some states including Florida and Georgia have displayed success in funding education with this mechanism. The literature suggests, however, that lotteries have not emerged as the panaceas that policy makers had originally intended.

Lotteries have proven to be appealing mechanisms for producing revenue because they are considered a voluntary tax. Individuals pay the tax because they want to instead of having to pay the tax because the government demands it. The voluntary aspects of lotteries are extremely appealing to governors and legislators because resources for social intervention programs are generated without unpopular tax increases (Rubin, 1993). Theoretically, legalized gambling intends to raise revenues without increasing the tax burdens of the lower class (Mikesell, 1989).
The utilization of gambling in the United States began as early as the 1700’s when the lottery was used to raise revenues to pay for the colonial Army (Rodgers and Stuart, 1995). During the next two centuries, various forms of gambling were employed to finance road repairs and elevate revenues for universities and colleges, while insuring the availability of expenditures for other social intervention programs.

Corruption emerged as an unwanted side effect of sanctioned gambling, and in 1893 the Federal Government prohibited all forms of legalized gambling (Geary 1997). New Hampshire was the first state to reinstate gambling in the form of a lottery in 1963. In 1988, only Nevada and New Jersey operated legal casino gambling. Presently, forty-two states engage in some form of legalized gambling, while only Hawaii and Utah forbid wagering entirely (Gross, 1998). Legalized gambling accounts for one of the fastest growing industries in the United States. 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). Numerous state and city political leaders, promote gambling enterprises of various kinds as remedies for ailing local economies. The prospect of new jobs for workers and revenues supplementing state and local budgets encourage public officials to join forces with gambling developers and promote the expansion of the industry (Livernois, 1987).

A lottery is a game of chance in which individuals have an equal opportunity of winning prizes. It is defined as a form of gambling in which chances to share in a distribution of prizes are sold (Mikesell and Zorn, 1986). For centuries, lotteries have provided fun and entertainment. The first state-organized lottery began in Italy in 1530. England soon adopted the idea, and
during the early 1600s, the first settlers imported the lottery idea to the limited states. America’s first lottery was held in Jamestown in 1612 and provided half the budget for the town’s operations. George Washington used a lottery to supplement funding of the continental army, and Thomas Jefferson implemented a lottery to fund public projects. Prior to taxation, lotteries were especially popular in the South where proceeds were used to fund the construction of bridges, toll roads, and schools. From 1790 until the Civil War, lottery revenues financed the construction of 300 schools, 200 churches, and 50 colleges, including Harvard, Yale and Princeton (Department of Audits and Accounts, State of Georgia, 1998).

The first modern state-operated lottery was authorized in 1964 in New Hampshire. The proceeds were used to support education. Today, lotteries are legal in thirty-eight states and the District of Columbia, and revenues fund a variety of initiatives including education, transportation, prison construction, economic development, environment and natural resources programs, and senior citizen centers. The U.S. still remains the leader in the use of public organized lotteries, but the utilization of such mechanisms is becoming quite popular throughout the world. Lotteries can be found on the continents of Europe, Asia, Australia, Africa and are also located in Canada and Latin America (Department of Audits and Accounts, State of Georgia, 1998).

Many states contend that they have benefited financially from adoption of a lottery. In 1993, the lottery became a long-term solution to Georgia’s problem plagued educational system, and the program has contributed significantly to Georgia’s educational system since its inception. Barry (1995) postulates that lottery profits in Georgia in 1995 yielded $85 million academic in scholarships. Profits from this lottery also support the Help Outstanding Pupils
Educationally (HOPE) Scholarship Fund, which allows students who maintain a B average in high school to receive free tuition at instate colleges and universities. This scholarship fund has improved the standards within the Georgia university system since fewer students go out of state to college, and as a result, Georgia Tech’s SAT average score has become one of the highest in the nation among public universities.

Florida was the first southern state to pass the lottery in 1986. Over a ten-year period, the lottery earned more than $7.8 billion for education. Florida law requires that $.38 of each $1.00 spent on the lottery be directed to the state’s Educational Enhancement Trust Fund. These funds are distributed to the state’s 67 public school districts, 28 community colleges, and nine universities. Preschool programs, minority teacher scholarship programs, the Bright Futures College Scholarship Program, as well as specific needs as determined by each school district’s, community college, and state university symbolize the use of lottery profits. The Bright Futures College Scholarship Program allows Florida high school graduates having a GPA of at least 3.5 in a college preparatory program and a score of 970 on the SAT or 20 on the ACT or a passing score on the Florida College Placement Test to receive full tuition to an instate college, university, or vocational programs (National Education Association, 1997). Students, who meet the same requirements, except that their GPA is 3.0, receive 75% tuition. Since children from wealthier families tend to score higher on standardized tests (Odden and Picus, 1992), and state lotteries are predominately supported by the less affluent (Rivenbark, 1997) hoping to “get rich quick,” some scholars would contend that less affluent families are supporting the education expense of wealthier students in Florida. The issue being that the proceeds received from lottery play is then redistributed to those students who score the highest on college entry exams.
Kentucky has also implemented a college scholarship program similar to those of Georgia and Florida. In fiscal year 1999, the Kentucky Educational Excellence Scholarships (KEES) began giving tuition vouchers to students who stayed in Kentucky to attend a college, university, or other approved post secondary educational system. Also, Kentucky plans to award need based scholarships financed by lottery profits. Beneficiaries of FY 1998 profits for the Kentucky lottery included Kentucky Vietnam Veterans who received a one-time bonus of $32 million, the State’s educational system, which received $214 million, and the State’s General Fund, which obtained the remainder of more than $850 million (Kentucky Lottery Department, 1998).

While lotteries are touted by many as a means of increasing funds for needy state programs, opponents contend that lotteries are not the panaceas that policy makers and voters rave about. Miller and Pierce (1997) examined the financial aspects of education lotteries including short-term and long-term effects. They found that states, which had adopted state-sponsored lotteries, have increased per capita spending on education during the early years of the lottery; however, as time passed, these same states witnessed an overall decrease in spending for education. Stanley and French (2001) measured the impact of lottery proceeds on federal spending for education, and the authors concluded that lotteries did not significantly increase the amount of federal revenue allotted to states for financing education. 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 in order to determine their impact on educational revenue enhancement of public education expenditures. He attributes this 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 (Spindler, 1995, p. 60). Spindler (1995) contends that, in states where lottery revenues are earmarked for education, lottery dollars are actually substituted for general fund expenditures. Fields (1996) supports Spindler’s theory and asserts that the failure of Florida’s lottery to meet everyone’s expectations of success expounds on the limitations of this revenue enhancing mechanism. 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 to fund 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 are intended to enhance the state’s educational system, the legislature is not legally bound to boost education with these profits. As a result, the earmarking of revenues from lotteries to replace regular, budgeted educational funds instead of enhancing education depicts Florida’s education policy.

As suggested, several articles in the literature examine why lotteries can be termed a “fiscal hoax” in revenue generation. During the initial inception of lotteries in a state, the mechanism receives intense play by individuals trying to “get rich quick” (Mikesell and Zorn, 1986: 312). In the early years of the lottery in a particular state, especially those states with lotteries that are surrounded by states without lotteries (e.g., Georgia is surrounded by Tennessee, Alabama, and South Carolina - all of which have rejected the inception of a lottery), the number of players is quite high. However, as the newness of the lottery wears off, the mechanism receives less and less play, especially if a bordering state adopts a lottery or another
form of gambling such as casinos. If states earmark lotteries dollars to pay for a large portion of their education expense based on prior revenue figures, the educational expenses of a state may not be covered (Mikesell, 1989).

Another major problem with lotteries emerges 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 also occur because a surplus of revenue exists from the lottery (Rubin, 1993). Rodgers and Stuart (1995) stipulate that “the revival of lotteries,” despite “negative distributional effects,” has occurred because of the belief that lotteries, instead of other tax instruments, raise additional revenue by generating smaller losses than other taxes; therefore, lotteries are less painful to voters (p. 244). As a result, political leaders will endorse tax cuts (of both income or sales) and replace the lost revenue with lottery dollars, again, suggesting that fungibility is evident in the redistribution of lottery proceeds (Jones and Amalfitano, 1994).

THEORY

The literature suggests that states spend 3.8 percent of their lottery proceeds for education (Bracy, 1995). In an attempt to measure the impact of lottery proceeds on state total spending efforts for education, the literature stipulates that education has benefited from lottery revenues only in the short-term (Miller and Pierce, 1997). Longitudinal studies incorporating various time series regression analyses (interrupted times series and pooled time series), have failed to offer any empirical results that would support the notion that state-sponsored lotteries have contributed
to an increase in per pupil expenditures for education (Spindler, 1995; Miller and Pierce, 1997). Although Spindler (1995) briefly alludes to the fact that fungibility may be the leading cause of the insignificant impact that lotteries are demonstrating education, his study is limited because the units of analysis incorporated consist of only six states. Miller and Pierce (1997), fail to address the issue of fungibility altogether. This study expands on the previous two studies by incorporating all the states into a pooled time series regression model, in a similar manner as Miller and Pierce, while addressing the issue of fungibility as suggested by Spindler. Furthermore, the time frame of this study is much greater, compared to the other studies measuring the impact of lottery proceeds for education because the lottery is measured over a twenty-year period. The hypotheses derived from the literature and tested in this study are as follows:

**Table One**

**HYPOTHESES**

*Primary Hypothesis:*

H₁: States operating lotteries tend to spend more for education compared to states that do not operate lotteries.

*Secondary Hypotheses:*

H₂: States with larger numbers of students spend more for education compared to states with fewer students.
H₃: States with higher Gross State Products spend more on education compared to states with lower Gross State Products.
H₄: States with higher levels of population spend more for education compared to states with lower population levels.
H₅: States operating lotteries receive more federal funding for education compared to states without a lottery.
H₆: Traditionalistic states are less likely to spend more on education compared to moralistic and traditionalistic states.
**FINDINGS & DISCUSSION**

A preliminary statistical model was conducted on the data to warrant the need for further assessment of the data. An independent samples t-test was utilized to determine mean variations between the units of analysis in the data set (differences between lottery and non-lottery states). The following table reports the findings of this statistical test.

**Table Two**

**INDEPENDENT SAMPLES T-TEST**

<table>
<thead>
<tr>
<th>LOTTERY PRESENCE</th>
<th>LOTTERY MEAN</th>
<th>t</th>
<th>Sig. (2 – tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATESPDU</td>
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<td>4675.79</td>
<td>9.577</td>
</tr>
<tr>
<td></td>
<td>1.00</td>
<td>2160.20</td>
<td>9.442</td>
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<tr>
<td>GSP</td>
<td>.00</td>
<td>128998.35</td>
<td>8.966</td>
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<tr>
<td></td>
<td>1.00</td>
<td>62166.31</td>
<td>8.843</td>
</tr>
<tr>
<td>LOTTERY</td>
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</tr>
<tr>
<td></td>
<td>1.00</td>
<td>XXXX</td>
<td>XXXX</td>
</tr>
<tr>
<td>POPULATION</td>
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<td></td>
<td>1.00</td>
<td>3910.90</td>
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</tr>
<tr>
<td>STUDENTS</td>
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<td>-.892</td>
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<tr>
<td></td>
<td>1.00</td>
<td>141.74</td>
<td>.874</td>
</tr>
</tbody>
</table>

**Conceptual definitions of the data:**
- **FEDSPEDU** – The total amount of federal spending for education received by the states from the federal government.
- **GSP** – The Gross State Product of each state adjusted for inflationary factors.
- **LOTTERY** – The amount of revenue each state receives from the lottery for education.
- **LOTTERY PRESENCE** – The dummy variable coded 0 = lottery states and 1 = non-lottery states. Utilized to explain some of the unexplained variance in the regression model.
- **POPULATION** – The number of residence in a particular state.
- **STUDENTS** – The number of students in a particular state.

**Note:** The lottery presence indicator is the dummy variable used to distinguish between casino and non-casino states in the preliminary statistical test.

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1 See appendix one for a discussion of the statistical models used in this study.
The results of the independent samples t-test, found in Table Two, reveals that significant differences between lottery and non-lottery states exist in a number of the indicators. The reported significance values of .001 found in the table suggest that a substantial difference between the comparison groups exist in state spending for education (STATESPEDU), the Gross State Product (GSP), the population found in these groups (POPULATION), and of course the difference in lottery revenues received by gaming states (LOTTERY). In summary, this statistical test reports that a significant difference exists between lottery and non-lottery states in the amount of proceeds spent on education. Are lottery revenues earmarked for education one explanations for this significant difference is per pupil expenditures? Due to the failure of the independent samples t-test in determining causal relationships between the variables, further analysis is needed to account for the impact that lottery revenues are having on education spending over time. The advanced methodological model utilized for this statistical endeavor is pooled time series cross-sectional regression analysis. Pooled times series regression analysis allows the researcher to use both cross-sectional and time series variation simultaneously to identify the impact of the lottery on education in the American states (Beck and Katz, 1996: 1). The following table reports the findings and discussion of this advanced statistical analysis. The regression model used to test the data is as follows.

\[
Y_{\text{SPEDU}}(t-1) = a + (B_1) \text{FPERPUP} + (B_2) \text{GSP} + (B_3) \text{NUMSTU} + (B_4) \text{POPUL} + (B_5) \text{LOTTERY} + (B_6) \text{LOTTERY PRESENCE} + E
\]
The .87 adjusted $R^2$ value shows that 87 percent of the variance is being explained in model one. The best linear unbiased estimator in the regression model is Gross State Product (GSP) because it the only significant indicator in the model. The data suggests that for every unit increase in the amount of GSP, an increase of 3.294 will occur in spending for education. The significance of the t-test in the regression models allows for the rejection of the null hypothesis between the variables GSP and spending for education. Therefore, the null hypothesis that, wealthier states spend the same for education compared to less affluent states,
was rejected in this study. With the t-test failing to report any statistically significance values of .05 or less, the following null hypotheses failed to be rejected.

\[ H_1 \]  Fiscal allocations from the federal government have had little effect on the amount of resources available for states to spend on education.
\[ H_3 \]  The number of students does not effect spending on education.
\[ H_4 \]  The population of a state does not effect spending on education.
\[ H_5 \]  The presence of a lottery does not influence state education spending.

A leading explanation offered for the insignificant impact of lotteries on state spending for education is the issue of fungibility. For instance, the state of Georgia has enacted laws that prohibit legislators from substituting education dollars with lottery dollars. As a result, specific cases like Georgia are benefiting from lottery proceeds for education (Barry, 1995). Georgia also earmarks all of its proceeds into specified educational programs for pre kindergarten and post-secondary education, allowing such programs to flourish as a result of the lottery (Barry, 1999). Secondly, most states only contribute a small portion of lottery dollars to education, further decreasing the probability that lottery dollars will increase per pupil expenditures for education. As Bracey (1995) suggests, only 3.8 percent of the lottery proceeds are ever spend on education.

**Limitations**

The limited number of independent variables in this study fails to explain all the indicators that may have an effect on public educational expenditures in the United States. Other variables such as legislative and gubernatorial ideology and the percentage level of tax rates that each state incorporates in raising expenditures for education may also assist in predicting spending on education. Furthermore, this project does not make any attempt to explain the shifting of current educational expenditures to other programs and their replacement with lottery
dollars (fungibility). The concept of fungibility by state legislatures in regards to education 
expenditures is highly probable. This fabrication makes the lottery look insignificant in 
generating dollars, when in reality the device works quite well. Also, those states with lotteries 
initially may have significantly enhanced their education expenditures, but reductions in federal 
spending for education counter these measures. Future explanations of these limitations may 
provide future research projects regarding state operated lotteries. Efforts in confronting these 
issues will offer public administrators with a better understanding of this revenue-generating 
device.

Conclusion

When these benefits are assessed over time and across-sections (states), the statistical 
models report that lotteries are failing to significantly impact financing education. Although this 
study is more comprehensive than both the Spindler and Miller and Pierce studies, the 
conclusions derived from the data suggest that state operated lotteries are failing to offer 
substantial benefits to students due to the issue of fungibility, and the small portion of actual 
dollars generated by the lottery for education. Future studies should incorporate data to 
determine the degree of fungibility in each state. Also, studying each state on a case-by-case 
basis may assist in understanding this social phenomenon. The implications of this study suggest 
that if states currently operating without a source of supplemental income were to incorporate 
such a device, mechanisms should be in place to curtail the issue of fungibility, so students can 
truly benefit from additional revenue generated from a state-sponsored lottery.
DATA & METHODOLOGY APPENDIX

DATA

Conceptual definitions of the data:
FEDSPEDU – The total amount of federal spending for education received by the states from the federal government.
GSP – The Gross State Product of each state adjusted for inflationary factors.
Lottery- The amount of revenue each state receives from the lottery for education.
Lottery Presence – The dummy variable coded 0 = lottery states and 1 = non-lottery states. Utilized to explain some of the unexplained variance in the regression model.
Population – The number of resident in a particular state.
Students – The number of students in a particular state.

Aggregate data was used in Gross state Product, total lottery revenues, population and number of students. The state spending and federal spending variables were standardized into variables measuring per pupil expenditures for each governmental entity. The operationalization of each variable occurred as follows: Federal spending on education was gathered from the Census Bureau, Gross State Product (GSP) was also obtained from the Bureau of Economic Analysis, data on the number of students and the population of each state was assimilated from the U.S. Census Bureau, lottery proceeds data also was obtained from the Census Bureau. The dummy variable (Lottery) was coded 0 for states with a lottery and 1 for states without a lottery.

METHODOLOGY

Preliminary data analysis was conducted on the data set to determine differences between lottery states and non-lottery states. An independent samples t-test was conducted on the data using the SPSS statistical program.

The pooled time series cross-sectional data analysis allows the researcher to use both cross-sectional and time series variation simultaneously to identify the impact of the lottery on education in the American states (Beck and Katz, 1996: 1). Some states have been more likely to adopt a lottery for funding education as compared to other states. The lottery should have some effect on the budgetary allocations each year of those states with a lottery. The dimensions of pooled time series used in this study are 50 states and 20 points in time (years).

A major methodological problem that can occur with pooled time series cross-sectional data analysis is heteroskedasticity. In pooled data, some units are inherently more various than others at all times. Employing a lagged dependent variable in the regression model, along with standardizing the data will assist in controlling this problem. Secondly, autocorrelation or serial correlation pose a threat to the data in a pooled times series analysis. To check for autocorrelation the Durbin-Watson M techniques was employed and this methodological problem was absent from the data set. Finally, the tolerance and Value Inflationary Factor statistics were checked for multicollinearity in the data set. They revealed levels of .9 or above tolerance levels and 5.6 or below for VIF levels. Therefore, multicollinearity was not a problem in the data set.
Bibliography


