Financing Ohio’s Public Schools through the Ohio Lottery: Quantitative and Qualitative Dimensions of the Lottery’s Tax Incidence

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This dissertation titled
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Dimensions of the Lottery’s Tax Incidence

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Abstract

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Financing Ohio’s Public Schools through the Ohio Lottery: Quantitative and Qualitative Dimensions of the Lottery’s Tax Incidence

Director of Dissertation: Frans H. Doppen

For nearly four decades the Ohio lottery has offered its products with the promise of providing a financial benefit to Ohio’s public schools. The purpose of this study was to examine the tax incidence of the Ohio lottery in addition to qualitative aspects of lottery play. Data were collected from Ohio lottery sales and U.S. Census data both aggregated by zip code. Analysis of tax incidence was conducted through Suits Index analysis with confidence intervals in addition to double-log regression analysis creating elasticity coefficients. Qualitative data were collected through interviews. Five qualitative interviews provided data that were analyzed from an adapted grounded theory perspective. Suits Index analysis suggested that the Ohio lottery has been a regressive form of school finance for all of the years covered in this study (1992-2010). The least regressive games were lottery products that offered larger payouts with lower odds of winning. The most regressive games offered significantly smaller jackpots with higher odds of winning. Double-log regression revealed that lottery sales were supported disproportionately by less affluent consumers. Zip codes with higher median ages were found to drive increased lottery sales for all three types of lottery games. Non-African American minorities in Ohio (zip code analysis) were also shown to drive increased Lotto
game sales. Increased percentages of males in a zip code resulted in increased Instant game sales. A higher level of education in a zip code reflected increases in lottery product’s sales. Findings of regressivity were confirmed in lottery scholarship; however, demographic representation of lottery play offered mixed results. Qualitative findings of this study revealed avoidance by lottery players to outside interference in their lottery play. Respondents also suggested a strong ability to control the lottery process when they were able to select numbers or tickets based on socially constructed or situationally applicable rules and values. Finally, respondents shared that they have some sense that lottery profits are directed to schools, despite voicing a strong anti-lottery and anti-large school district sentiment. When viewed in the context of sociological theory of stratification, the findings suggested that the lottery acts as a regressive tax on Ohio’s lottery consumers while education fails to receive a financial benefit due to fungibility described in existing literature. The primary research suggestion was to extend benefit incidence research. Policy recommendations that connect lottery regressivity to Ohio’s schools included a commitment to finance Pre-K and Kindergarten initiatives, class size reduction strategies for Ohio’s poorest schools, and a higher education lottery scholarship funded through lottery profits for graduates from Ohio’s poorest high schools.

Approved: ____________________________________________________________

Frans H. Doppen

Associate Professor of Teacher Education
Dedication

This dissertation is dedicated to Richard and Jane Daberkow; Kayla, Noah, and Leah Daberkow and most affectionately, Stefanie Daberkow.
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As a Christian, I am thankful to God that, through His Son Jesus Christ, so many doors have been opened and so many crooked paths have been made straight throughout the process of my doctoral work.

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I am very appreciative of the willingness of the participants to freely offer their perspectives during my qualitative interviews. Their humor was engaging and their openness was beneficial to producing data that helped to explain lottery participation.

It is impossible thank my family enough in just a few short sentences, but I am still going to try. My parents – Richard and Jane Daberkow – have always been a constant source of encouragement and support. They were responsible for getting me started at Ohio University and I am thrilled to share the completion of my dissertation with them as well. Thank you, Mom and Dad. My children have always been a source of much needed distraction from writer’s block or mental distress. Kayla Grace Daberkow prayed for my work constantly and always provided loving support. Noah Clarence Daberkow offered structured distractions that I will always be thankful for. What would I have done without Legos and Thomas the Train? Finally our youngest child, Leah Grace Daberkow provided everything a Dad needs for motivation – lots of smiles.

Finally, I acknowledge the invaluable contributions of my wife, Stefanie Lynne Daberkow. I have been blessed by God to have a wife that not only takes care of all the little details that kept our family on track during my work, but she also encouraged, inspired, and motivated my work through completion. Not only am I thankful for her taking care of our family while I worked, but she also read through seemingly endless drafts of this dissertation. Our discussions of the implications of the findings of my dissertation were especially enjoyable. Thank you, Stefanie.
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Chapter One: Introduction

Study Background

The history of Ohio public school finance reflects a dynamic dialectic of social, political, and economic conflict. From its inception as a state, Ohio has retained the mandate to fund elementary and secondary public education (Ohio Constitution, Article VI, § 2). However, striking the appropriate balance to mollify the financial interests of all stakeholders is the source of the school finance conflict. In the earliest stages of Ohio’s venture into financing public education, financial resources were provided through state appropriated parcels of land that were to be used to finance local education initiatives (Maxwell & Sweetland, 2002). Within the last few decades perhaps the greatest challenge to financing Ohio’s schools has been exposed in the need to educate a rapidly changing and diverse student population (Frankenburg & Siegel-Hawley, 2008) amid rapidly contracting financial resources. Each element of the public school finance picture is a contested economic exercise which, as Maxwell and Sweetland (2002) suggested, is a direct result of education finance being driven by the law of scarcity resulting in the “allocation of limited resources among unlimited needs and wants” (p. 32).

The focus of this research study is an examination of the smallest part of the state school finance equation: the revenue of the Ohio lottery as it benefits Ohio’s primary and secondary schools.¹ The lottery as a school finance mechanism has been in place for nearly four decades and was the result of social and political compromise to meet the pressing economic needs of financing Ohio’s schools. The purpose of this study is to examine the manner in which lottery funds are collected within the framework of the

¹ A detailed financial description of the budgetary context of the Ohio lottery is included in Chapter 1.
lottery as a tax providing an educational benefit. Lottery revenue will be considered as a tax and classified as either regressive, progressive or proportional. The goal of this analysis is to determine whether the financial contribution to public education by the Ohio lottery can be classified as an equitable mechanism. In addition to the quantitative components of lottery analysis, qualitative aspects are explored within the framework of cultural dimensions of lottery participation. Both qualitative and quantitative components of lottery taxation are considered because they both contribute to an understanding of the tax incidence\(^2\) of lottery play as it intersects with financing public education in Ohio.

Before moving to a historical overview of school finance in Ohio and a detailed discussion of the political and social background of the Ohio lottery, the budgetary context of the Ohio lottery is discussed, followed by a consideration of the nature of the lottery as an implicit tax. This historical, social and political review will frame the context of the economic conflict inherent in the Ohio lottery as a school finance mechanism. Next, this chapter presents the problem statement to suggest there is a dearth of analytical scholarship on the impact of Ohio lottery revenue on Ohio school finance equity analysis in addition to an understanding of the cultural nature of the tax incidence of the lottery. Finally, the chapter will discuss limitations of this study as well as present a description of significant definitions.

\(^2\) Tax incidence refers to the concept of determining what income group bears the greatest burden of the tax under consideration. The idea of the tax incidence of the lottery is developed more fully as the key definitions of this study are detailed after the context of the lottery is developed and the idea of the implicit lottery tax is established.
Budgetary Context of the Ohio Lottery

Despite its contentious position as a mechanism for funding public schools, the Ohio lottery is the smallest component of the school funding revenue formula. In the biennial budget for 2006-2007, the state of Ohio proposed nearly $10 billion allocations to K-12 public education with less than 10% generated from lottery proceeds (Ohio Office of Budget and Management, 2005; Ohio Lottery Office of Finance, 2008). The major categories of expenses for the State of Ohio are shown in Table 1 with recommended appropriations. The total proposed expenditure of nearly $10 billion on K-12 public education in the State of Ohio represents slightly less that 20% of the budget. Figure 1 graphically represents the proposed expenditures by budget category.

Table 1.

* Expenditure values reflect two year average of the 2006-2007 Proposed Expenditure.
** Expenditures in millions of dollars.
*** Compiled from Ohio Office of Budget and Management (2005).

<table>
<thead>
<tr>
<th>Budget Category</th>
<th>Proposed Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary and Secondary Education</td>
<td>$9,808</td>
</tr>
<tr>
<td>Higher Education and Other Education</td>
<td>$2,571</td>
</tr>
<tr>
<td>Medicaid and Other Health and Human Services</td>
<td>$21,210</td>
</tr>
<tr>
<td>Public Safety and Protection</td>
<td>$2,764</td>
</tr>
<tr>
<td>General Government and Tax Relief</td>
<td>$12,350</td>
</tr>
<tr>
<td>Transportation and Development</td>
<td>$4,063</td>
</tr>
<tr>
<td>Other</td>
<td>$1,085</td>
</tr>
</tbody>
</table>
Figure 1. FY 2006-2007 Average Annual Recommended Appropriations. Appropriations shown in billions of dollars. Compiled from Ohio Office of Budget and Management (2005).
The state’s contribution, however, only comprises one part of the local school district education budget. Federal, state, and local revenues combine in each district to present a mix of revenues sources depending on the district’s individual state funding formula award. This mix of revenue sources can vary greatly as is evidenced in the great disparities in wealth distribution in the state of Ohio. The wealthiest ten districts in the state receive an average of less than approximately 15% of their revenue from the state funding formula, while the ten poorest school districts receive an average of approximately 70% of their revenue from the state funding formula (Ohio Department of Education, 2011). The aggregate contribution is summarized in Table 2 reflecting the largest contribution to school districts coming from local revenue sources.  

Table 2.

2008 Aggregate Funding by Source for Ohio’s School Districts

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>$7,373,818,764</td>
</tr>
<tr>
<td>Local</td>
<td>$8,474,462,820</td>
</tr>
<tr>
<td>Federal</td>
<td>$1,362,039,755</td>
</tr>
<tr>
<td>Total</td>
<td>$17,210,321,339</td>
</tr>
</tbody>
</table>

This state, local, and federal revenue relationship is shown graphically in Figure 2.

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3 Table 2 and Figure 2 are compiled from Ohio Department of Education, 2012.
With a snapshot of Ohio school finance revenue in place, the Ohio lottery can then be seen in context when considered as a portion of the state budget and as a percentage of the State contribution to local district financing efforts. At $2.3 billion in sales for FY 2008\(^4\) the Ohio lottery sales represent less than 5.0% of the expenses for the State of Ohio\(^5\). As the lottery dollar works through the mechanism of prizes and administrative

---

\(^4\) Ohio Lottery Office of Finance (2008)
\(^5\) Compiled from Ohio Office of Budget and Management (2005).
fees, the remaining funds are allegedly\(^6\) funneled to K-12 education. It is important to note that it would seem that since districts receive varying amounts from the State based on local wealth, poorer districts would receive a greater percentage of lottery revenues. The Ohio Department of Education, however, publishes the Ohio Lottery Education Fund appropriations schedule (Ohio Department of Education, 2008b) that suggests that the variability seen in district wealth as indicated on the 2008 Cupp Report (Ohio Department of Education, 2011) is not mirrored on the lottery appropriations schedule.

**The Lottery as an Implicit Tax**

Within school finance and economics literature the lottery is presented as a tax. Monk and Brent (1997) suggested that “…the lottery is a tax. It is of no consequence that individuals play games voluntarily. It is also of no consequence that a select few will benefit greatly from playing if they are among the lucky winners” (p. 114). They reason that the lottery is a tax because “[l]otteries generate revenues that can be used by governments to finance public services such as education” (p. 114). In continuing their argument they offer a comparison of the lottery tax to other consumption taxes that deserves further explanation here to present the case for the lottery as an implicit tax.

Throughout a consumer’s economic life products are purchased that have a sales tax attached to the transaction. The sales tax can either be a fixed amount based on the absolute quantity purchased or the tax can be a percentage of the amount of the purchase that is subjected to the sales tax. While consumed products are subject to the preferences

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\(^6\) The issue of fungibility of lottery revenues is explored in greater detail in Garret (2001) and in Chapter 5. The question of whether lottery funds cause a real growth in education expenditures is considered against the possibility that since lottery funds are directed to the Ohio Department of Education through the state general fund, in reality the lottery may simply allow for a replacement of funds that increase expenditures in other budget categories.
of the consumer to varying degrees, the voluntary nature of the sales tax, also referred to as an excise tax in finance scholarship, does not mitigate the requirement that a portion of the sale (either as a fixed amount or a per unit value) is collected as a tax by differing levels of government. The tax can certainly be avoided if the consumer determines not to purchase the product; however, when the product is purchased, a portion of the price is returned to the taxing authority. Monk and Brent (1997) continued by connecting the sales tax levied on other consumer goods to the tax implicit in lottery play. They suggested that “[i]n much the same way [as other products subject to the sales tax] the sales tax is levied on the purchase of goods, the lottery is a tax on playing a game” (p. 115). While “[a]n individual cannot be coerced” into purchasing any consumer good, if the purchase is made, the tax is not voluntary (p. 115). Consumers can choose to avoid the lottery tax, or any sales tax, by not purchasing a lottery product or a specific consumer good; however, if the purchase is made, it is not voluntary whether or not a certain portion of the purchase is directed to a taxing authority for the purpose of “financing public services” (p. 114). Most taxes can be avoided if the financial transaction (earning income or making a sale or a purchase, for example) is not conducted. However, once the economic activity is engaged in, the tax is mandated by the taxing authority. There is no choice to pay the tax once the purchase of the lottery ticket is made. It is for this reason that the lottery is referred to in this study and in lottery scholarship as an implicit tax.
History of Ohio School Finance

While the U.S. Constitution is largely silent on specific issues of financing schools (Burrup, Brimley, & Garfield, 1999), the Ohio Constitution places on the shoulders of Ohio’s General Assembly the requirement to provide “thorough and efficient schools” (Ohio Constitution, Article VI, § 2). Legal precedent has reinforced the notion that school finance issues are a state concern (Maxwell & Sweetland, 2002). Bowles and Gintis (1976) traced the emergence of the public school system supported by property taxes. They argued that a capitalist mode of production has driven the emergence of the modern industrial model for financing school systems (see also Callahan, 1962; Monk & Brent, 1997). Economic and political organization both contribute to making financing public schools a state concern.

According to Maxwell and Sweetland (2002), the history of Ohio school finance reflects a continual search by the state legislature for a method by which public schools can be financed in a politically palatable way. Interwoven in this conflict is the reliance on legal redress of perceived legislative failures. The modern era of financing public education in Ohio began at about the end of the First World War. Mort and Reusser (1951) argued that at this time financing schools through “newer forms of taxation” became a pressing legislative concern (p. 5). Despite school finance reform at the height of the Great Depression, “the financing of public education remained a problem in Ohio. [For example,] in 1937, the state … failed to make the February quarterly payment” to its school districts (Maxwell & Sweetland, 2002, p.15).
From the end of the Great Depression until the adoption of the state income tax (1972) and state sponsorship of the lottery (1973), “[n]umerous studies of the [financial] problems facing Ohio’s public schools were conducted by Ohio’s legislative bodies, the Ohio Department of Education, and other interested agencies and organizations” (Maxwell & Sweetland, 2002, p. 15). Without exception these reports – The Manahan Report, The Ohio Education Association [OEA] Study, and the Syracuse Report – suggested systems to alter school finance in the state of Ohio. The Manahan Report (1955) suggested that “[t]he state’s share… be increased” nearly 50% in addition to provisions for “extra levies” (Maxwell & Sweetland, 2002, p. 17). The OEA study (1962) recommended smaller class sizes and increased teacher salaries (Maxwell & Sweetland, 2002, p. 19). Finally, the Syracuse Report (1975) “intended to prevent future occurrences of the wide disparities that existed in the amounts being expended per pupil in poor districts and wealthy districts” (Maxwell & Sweetland, 2002, p. 21). These studies represent the seemingly perpetual effort on the part of policy makers to address school finance concerns. Throughout this period the Ohio General Assembly received report recommendations to increase the state commitment to its publicly funded schools. Political compromise necessitated the call for a more palatable school finance solution. Maxwell and Sweetland (2002) offered for consideration the case study of Governor Rhodes who promised to increase financial resources to Ohio’s schools if elected, “[h]owever, when [he] took office [1963]… he claimed that the state was in a financial crisis and that it should not seek new taxes” (p. 19). While Governor Rhodes

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7 Flescher, Flescher, & Holy (1962)
8 Ohio Education Association (1975)
acknowledged the pressing need for increased financing of public schools, the source of that revenue had not yet been realized. His broken campaign promise illustrates at the same time both the need for increased financial resources and the inability of Ohio’s legislators to embrace a solution that was politically feasible.

Contemporary political conflict experienced by former Governor Strickland and Governor Kasich in their attempts to engineer a solution to the school funding debate is analogous to that of Governor Rhodes. A highly polarized public debate makes claims on a state treasury for resources not readily available unless additional sources of revenue (new taxes) are created or existing sources extended (raise taxes)\(^9\). The major difference between the political context of Governor Rhodes and contemporary politicians is that the mandates of No Child Left Behind and the judicial mandate of *DeRolph* levies political and financial sanctions if a school finance solution is not crafted, while Governor Rhodes faced only the pressure of campaign promises to improve public education spending.\(^{10}\)

The impact of legal pressures on school finance must also not be underestimated. The companion cases of *Serrano v. Priest*, 1971, and *San Antonio v. Rodriguez*, 1973, reflect the unwillingness of the U.S. Supreme Court to take up individual state issues of school finance (Maxwell & Sweetland, 2002, p. 137). Maxwell and Sweetland argued that

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\(^9\) For a contemporary example of the political debate see Siegel and Vardon (2012).

\(^{10}\) The landmark case in Ohio School finance is found in *DeRolph* vs. The State of Ohio. Despite consistent legal victories and successful appeal defenses, *DeRolph* prevailed. Inaction by the Ohio General Assembly prompted *DeRolph*’s petition to the U.S. Supreme Court for a redress of grievances. A writ of certiorari was not granted, effectively removing the judicial mandate from the Ohio General Assembly to act on the earlier rulings of the Ohio Supreme Court. For a more complete offering of *DeRolph*, see McKinley (2005).
The majority opinion in *Rodriguez* recognized the imperfections of the challenged statutory scheme … A finding of unconstitutionality, however, … not only result[ed] in ‘an unprecedented upheaval in public education,’ but it would also [have] violate[d] the principles of federalism. (2002, p. 137)

The political, historical, and economic context of school finance in the state of Ohio reveals a continuous and contentious battle for scarce educational resources. Commensurate with the Great Depression, the economic hardships experienced in Ohio in the years prior to the adoption of the lottery translated into questions of economic need that could not be answered through established avenues of public finance. As “liberalized mores and lifestyles” became more accepting of state sponsored gambling during the 1960’s, the political door opened widely to the introduction of a mechanism of school finance that offered a “painless tax”\(^{11}\) to meet the financial needs of Ohio’s schools (Suits, 1977b, p. 19).

**Social and Political History of the Ohio Lottery**

The spring of 1973 was a tempestuous time in the state of Ohio. Organized efforts to memorialize the third anniversary of the Kent State shootings were in full swing. The nation was mired in a war in Southeast Asia while President Nixon was ensnared in his own political struggle for survival. By the end of the decade interest rates and inflation would surpass 10% (Parke, 2007). In the first three years of the decade, American reliance on foreign oil jumped 50% (http://www.wtrg.com/oil_graphs/oilprice1947.gif) as the price of a barrel of oil doubled between 1972 and 1974.

\(^{11}\) While the term “painless tax” likely did not originate in *Selling Hope: State Lotteries in America* (Clotfelter & Cook, 1987, p. 215) reference is given here for the phrase found frequently in lottery literature.
As lines formed at gas pumps around the nation, President Nixon was pressured to attend to price controls. The impact of the tightening financial noose around the economic neck of Ohioans was reflected in budget desperation at the state level. Legislators struggled to meet the increasing needs of Ohio’s schools (Suits, 1977b).

The economic condition of Ohio’s schools during the early months of 1973 mirrored that of the general economic and political environment. Maxwell and Sweetland described this era as a “period of decline” for Ohio’s schools (2002, p.5). While the post-War studies funded by the Ohio Education Association reinforced the suggestions of the Manahan Report, Parsons (1967, p. 6, as cited in Maxwell & Sweetland, 2002), declared that

> the gradually increasing educational costs have made it almost impossible for the poorer districts to maintain quality programs or to establish salary schedules competitive enough to employ or retain well-qualified personnel. The local school tax burden combined with additional municipal, state, and federal taxes has resulted in general reluctance of the voters to approve additional levies on local property for the support of schools… In response to the obvious need and continued requests, the 107th General Assembly has significantly changed the level of state support, the concepts of distribution, and increased state taxes for support of public schools. (p. 20)
The Ohio General Assembly responded by approving the creation of an Ohio state income tax which began in 1972. At the same time, State Senator Ron Mottl led a campaign to amend the Ohio Constitution to permit state sponsorship of a lottery.

Ron Mottl, a career Cleveland politician, was considered the “[a]rchitect and father of the Ohio Lottery” (http://www.mottlandmottl.com/skills.nxg). For the duration of his political career (beginning in 1958) he represented a blue collar suburb of Cleveland. He appealed to his constituency as a “Reagan Democrat” espousing socially conservative values (Reeves, 2005). Mottl’s career included serving in the Ohio General Assembly both as a Representative and as a Senator, in addition to serving as a U.S. Congressman. His final term in the Ohio House ended in 1997. He envisioned and promoted the lottery as a panacea to solve the economic problems of Ohio’s schools in a way that would be embraced by Ohio’s voters (State Lottery Debated, 1973, A24).

When considered as dual public finance strategies, neither the state income tax nor the lottery initially earmarked revenues for education. The promises made, especially for the state income tax, tended towards an amelioration of the state’s general revenue budget deficit, although, in a more abstract sense, the “tax was promoted based on the needs of education” (Maxwell & Sweetland, 2002, p. 20). In essence, the poor condition of Ohio’s public schools was used to advance the cause of the income tax although there were no legal requirements to use income tax revenue for public education.

Ohio was certainly not the first state to take up the idea of a state sponsored lottery to address its school budget woes. Clotfelter and Cook (1989) suggested in their groundbreaking work on state lottery growth that
For the first six decades of the twentieth century lotteries were banned in every American state… Yet, one after the other, states… embraced this form of public finance… In each state the government… ended its former prohibition of lotteries, made itself the sole provider, and used the profits from the operation as a new source of revenue. (p. 3)

New Hampshire was the first state to adopt lottery operations in 1964 with most of the East Coast states following within the next five years. Lottery growth then moved to the Midwest as Ohio, Michigan, Pennsylvania, and Illinois all adopted state sponsored lotteries (Clotfelter & Cook, 1989, p. 3). The regional growth of the lotteries was used by Sen. Mottl as one of the justifications for Ohio to approve an amendment to its constitution to provide for a state lottery. Supporters of the lottery argued that “[a]pproval of Issue 1 [to amend the Ohio constitution in order to legalize a state sponsored lottery] would allow the legislature to set up a state-run lottery which will… net $75 million to $100 million a year” (Lore, 1973a, p. 4B).

On May 6, 1973, two days before the election, a radio debate was held in Columbus, Ohio. The proponents of the lottery included State Senator Ron Mottl and State Representative Michael Stinziano. Sen. Mottl argued that, in addition to the lure of a state revenue surge, “Ohio is now losing $15 million to $30 million a year its citizens are spending on out-of state lottery tickets” (State Lottery Debated, 1973, A24). Sen. Mottl also claimed that approving a state lottery would have a positive impact on the “numbers racket.” As the Columbus Dispatch reported, Mottl also alluded to potential
decreases in the state income tax if lottery revenue would be able to offset the need for state income tax increases (State Lottery Debated, 1973, A24).

Opponents of the lottery at the debate included “Dr. Paul Minus, professor of church history at Ohio Wesleyan University… and Dr. Frederick Stocker, professor of economics at Ohio State University” (State Lottery Debated, 1973, A24). Minus countered Mottl by arguing that it was unclear whether organized gambling would decrease as a result of a state sponsored lottery. The main tenets of the organized opposition were rooted in moral grounds. Opponents argued that “[t]he social harm that would be produced by a lottery is too high a price to pay for the relatively small amount that would be generated by a lottery” (State Lottery Debated, 1973, A24). It did not go unnoticed by opponents of the lottery that, if passed, it would become a form of taxation on Ohio’s citizens. Minus argued that “[t]he lottery would draw from the lower-income families” as an unfair tax on Ohio’s working poor (State Lottery Debated, 1973, A24). The Columbus Dispatch further reported that “Stocker questioned whether it is the state’s role to promote gambling and whether the lottery is an equitable form of taxation” (State Lottery Debated, 1973, A24).

The public debate published through the editorial pages of Ohio’s newspapers connected the lottery decision with the Watergate scandal. William E. Smith, a Columbus resident, opined a representative editorial contribution when he suggested that

[a state sponsored lottery] would dangerously undermine citizens’ confidence in government. If ever there was a time when integrity and honesty are needed it is now. How can the establishment of a state lottery possibly build credibility
when on the one hand the state promotes gambling to raise revenue and on the other declares all other forms of gambling – except horse racing – illegal? Even if the money received is allocated to worthy causes … the entire effort would be based on the very questionable premise that the end justifies the means. After the Watergate debacle this is a very shaky premise at best…. (Smith, 1973, p. A22)

On May 8, 1973, an unseasonably warm rainy day, Ohio approved an amendment to its constitution that made one small but important revision. Private citizens were still prohibited from organizing and maintaining lotteries; however, for the first time in the history of Ohio, the state was granted the authority “to conduct lotteries, to sell rights to participate therein, and to award prizes by chance to participants…” (Ohio Constitution, Article XV, § 6, ¶ 2). Ohio voters approved the creation of a state run lottery by nearly a two-to-one margin (Lore, 1973a, p. A1). Ohio’s largest urban areas were credited with providing the greatest political support for the lottery which drew praise from Sen. Mottl on Election Day when he expressed his thoughts, “Thank God for the big cities” (Lore, 1973a, p. A1).

Understanding the willingness of Ohioans to embrace a state sponsored lottery at the ballot box is a largely unresolved discussion. Clotfelter and Cook (1989) theorized that “the major share of the increasing acceptance of lotteries in the United States must surely be due to… [a] general liberalization of attitudes on social and moral questions in society” (p. 43). They offered for consideration national polling data that suggested Depression Era approval of legalized lotteries by barely half of all adults which increased to two thirds by the time Ohio adopted its lottery (p. 44). They presented the work of Bell
(1970) which supported the idea that “the rise of ‘a hedonism which promises material ease and luxury’… [took] the place of traditional notions of the Protestant work ethic” (as cited in Clotfelter & Cook, 1989, p. 45). Schor (1998) extended this idea of consumerism to suggest that this behavioral shift over the last half century mirrors a change in the reference groups available for comparison by consumers. She suggested that “[a]dvertising and the media have played an important part in stretching out reference groups vertically” (1989, p. 5). Clotfelter and Cook (1989) offered that “[w]hile the [social] changes of this sort are difficult to document precisely, the rise in popularity of lotteries may be merely an indication of the extent to which society at large has become more permissive on social issues” (p. 45). The cultural aspects of lottery adoption are considered in part in greater detail in Chapter 2.

After two years of political, legislative, and legal battles, the Ohio lottery began selling tickets on August 9, 1974, the same day that Nixon resigned his office and Gerald Ford was sworn in as the 38th President of the United States. The connection between the historical context of the lottery and the resignation of President Nixon is more than a timely coincidence or historical trivia. Smith (1973) suggested that the Watergate Scandal illustrated the Nixon Administration fatally employing the idea that the ends justify the means, which he claimed is the same rationale proponents of the lottery had embraced.

Less than a day after President Nixon resigned, lottery leaders throughout the Midwest were prepared for a political assault on federal legislation that outlawed interstate lottery commerce. Larry Parisi, legal counsel for the Ohio lottery commission “urged [lottery] commissioners… to begin lobbying the Ohio Congressional delegation
on the matter ‘now that they’re not preoccupied with other matters’” (Lottery Measures Pushed, 1974, p. A1). With five bills awaiting action in the Senate and 36 in the House, Parisi suggested that “[w]ith a decision now made [in the White House], the (lottery) legislation could become very active again” (Lottery Measures Pushed, 1974, p. A1). On a larger scale, the rapid growth of lotteries nationwide was reflected in the feverish attempts by Ohio legislators to maximize the potential of this newly legalized form of school finance. By then, in accordance with a general trend towards greater acceptance of state-sponsored gambling, Ohio had joined the rising tide of lottery popularity (Clotfelter & Cook, 1989).

Early contributions of lottery profits were forwarded to the general fund with the understanding that in kind transfers should follow to Ohio’s public schools through the state funding formula (M. Bycko, personal communication, September 25, 2008). A decade later, the Ohio General Assembly mandated the separation of lottery revenue into a dedicated Lottery Profits for Education Fund. By 1987, “the [Ohio] constitution was … amended to require that all lottery profits be used for the support of elementary, secondary, vocational, and special education …” (Rau, 1998, p.1). Before 1987, lottery profits were still used for education, despite the absence of a legislative mandate. The constitutional amendment in 1987 specifically required that “lottery proceeds must be used ‘solely for the support of [education] as determined in an appropriation made by the General Assembly…’” (Ohio Constitution, Article XV, § 6 as cited in Rau, 1998, p. 2). With a discussion of a brief political and economic history of the Ohio lottery in place, understanding the social context of school funding disparities is considered.
Social Context of Educational Inequity

Illuminating the debate that centers on the role of school funding in sociological discussions of educational inequity, Condon and Roscigno (2003) examined the distribution of financial resources within an urban district in the context of race and class. They began by considering the conflicting research that examines the link between how school districts allocate limited resources and how this distribution impacts academic achievement. Highlighting the work of Kozol (1991) they suggested that qualitative research points to the relationship between “wealth [and] school district… quality…” (Condron & Roscigno, 2003, p. 18). While they noted that wealthier students tend to populate schools that are the beneficiaries of larger per pupil financial resources, the extended connection to academic achievement is less pronounced in school funding literature. Offering the work of Hanushek (1989, 1994, and 1996) as an example of the evidence presented against the argument that financial resources impact student achievement, Condron and Roscigno suggested that contemporary scholarship points more to “the question of … how money may promote achievement through the purchase of specific resources” (2003, p. 19). The impetus for their study is found in the limitation of existing work (at the time) considering the impact of the distribution of resources beyond district level analyses.

In positioning district and school level spending disparities within the context of sociological theory of social stratification, Condon and Roscigno argued that “there is good sociological reason to expect that such discretion at the local level may reflect and
reinforce local stratification patterns—specifically class and racial inequality” (2003, p. 21). They further suggested that

how these processes unfold, and preliminary qualitative analyses we conducted suggest that these mechanisms are, by no means, mutually exclusive. First, since school board members in most locales are elected officials, their decision making is likely to be shaped with a voting constituency in mind. Since poor and minority communities are more likely to be alienated from the political process and less likely to participate in it (Piven & Cloward 2000; Teixeira 1987), school board decision making is arguably shaped more by concerns and issues that are of relevance to the more affluent, voting public. Such a bias in decision making may occur without direct pressure from voters and parents, although parent and parent-teacher organizations from higher-SES, white schools tend to be more active and politically astute in pressing local school boards for resources (National Committee for Citizens in Education 1975; Reed 1982; Zeigler and Boss, 1974).

(Condron and Roscigno, 2003, p. 21)

In summarizing research preceding their study, Condron and Roscigno “pos[ed] that the most important function of spending is instructional. Instructional funds are used for teachers' salaries, textbooks, and various other material supplies related to classroom instruction” (2003, p. 21).

Condron and Roscigno continued as they examined data detailing the allocation of financial resources among 89 elementary schools in Columbus City Schools. Connecting financial expenditures, student achievement data, and student demographic
variables, Condron and Roscigno (2003), through regression analysis, concluded that the “variation in spending within the district [is] linked to patterns of racial and class stratification” (p. 27). These findings have important implications for the study of the collection of lottery sales across racial and economic lines. If the lottery perpetuates variation in educational revenue based on race and economic class, then the lottery may play an enabling role in continuing not only financial inequality between school districts, but the lottery would then also contribute to the achievement gap well documented throughout educational reform scholarship (Haycock, 2001; Lee, 2002; Singham, 1998).

In extending their findings of within district school spending disparities, they suggested that “schools that spend more exhibit higher levels of academic achievement” (p. 30). Their conclusions that present within district spending disparities across racial and economic lines prompted their reasoning that “[a]lthough unequal spending within districts has received comparatively little attention in legal cases and the sociology and education literatures, such disparities clearly warrant more attention” (p. 32).

While Condron and Roscigno (2003) drew data from a single district considering between school differences in expenditures to highlight “patterns of racial and class stratification” (p. 27), Roscigno, Tomoskovic-Devey, and Crowley (2006) examined a national data set in the same context of stratification. They endeavor to “develop a conceptual model to explain local advantages and disadvantages and their role in generating, and perhaps reproducing, inequality” (p. 2121). Their study is important within the context of the tax incidence of the lottery. The lottery, as a mechanism to finance public schools, can potentially act as a vehicle through which educational
inequality is perpetuated if lottery revenues are collected disproportionately based on economic class patterns.

Roscigno et al. (2006) continued by describing the impact of location in the context of access to educational resources by differentiating between inner city, rural, and suburban frames of access. They described urban [inner city] and rural areas suffering from a decline in manufacturing jobs as differentiated from suburban areas that “tend to be populated by educated, two-parents families [that]… have lower rates of poverty” (p. 2122). Family resources and family structure, they argued, are dictated by geographic circumstances within the context of “the stratification that they produce” (p. 2122). These economic constraints, they theorized, have important implications for the resources that can be made available to education. They did, however, make an important distinction in their study “to conceptually disentangle… family and school resources across inner city, rural and suburban places from the educational investment of those resources” (p. 2123).

Their most general theoretical argument is that families and schools, as distinct although often overlapping institutional spheres, are embedded within and shaped by places – places that vary significantly in opportunity and, consequently, resources. Here we are recognizing both [emphasis in original] the spatial patterning of opportunity and the ways in which local opportunity permeates or mitigates inequality through more familiar and proximate institutional (i.e., family and school) channels. (p. 2124)
Again the connection to lottery tax incidence cannot be understated as it is woven through geographic and economic stratification patterns.

Roscigno et al. (2006) employed “hierarchical linear and hierarchical logistic modeling” pursuant to their claim that “inner-city and rural deficits in achievement and attainment are a function of family/school resources and investments…” (p. 2129). Their results suggested a number of connections between “resource inequalities and… educational investments” that help to contextualize lottery tax incidence analysis. Roscigno et al. (2006) found significant differences in income distribution between urban/rural and suburban families. In addition to income disparities, rural and urban parents are less likely to have earned a college degree. At the school level, urban students are more likely to attend schools populated predominately by minorities. Per pupil expenditures are important to understand because of their reflection of family resources differences. Rural schools spend less per student than do suburban schools while urban schools likely spend less per student than do suburban school when removing the impact of federal contributions to local urban school districts (Roscigno et al., 2006). These resource disparities at both family and school levels translate into inequalities in potentially influential investments, most notably household educational items, cultural capital, parental involvement, teacher encouragement and the availability of advanced placement classes. (p. 2135)

The revenues of the lottery translate into the expenditures as Garrett (2001) would argue that lottery dollars do not return to the areas from which they originated. This would strengthen the claim that the lottery contributes to the reproduction of school finance
inequality. Roscigno et al. (2006) then moved to consider how these resource inequalities impacted student achievement.

Roscigno et al. (2006) concluded that “institutional resource differentials play a significant role in patterning achievement and attainment differences” (p. 2135). They supported this claim by finding that family class background, captured by income and parental education, has a strong positive influence on achievement and decreases the likelihood of dropping out… Notable are the persistent and strong effects of school resources, even after accounting for family resources. The concentration of poor students and non-white students depresses achievement and magnifies the average likelihood of dropping out… Consistent with expectations… it appears that a portion of family resource effects, most notably those for income and parental education, are mediated through household investment in education items, cultural capital, and parental involvement… Household educational items and cultural capital have strong consequences for achievement and the likelihood of dropping out of high school. (p. 2138)

With their complex analysis they outlined the connection between resources (both school and family) and level of academic achievement. They highlighted the importance of their study for “analyses of stratification… [and] for theory pertaining to the institutional foundations of inequality” (2006, p. 2139). For the purpose of lottery tax incidence analysis and understanding how the lottery can play a role in perpetuating stratification of
educational opportunity, these two studies by Condron and Roscigno (2003) and Roscigno el al. (2006) are crucial in their sociological theory contributions.

**Definitions**

This research study was guided by school finance terms as follows:

**Tax Incidence.** The operative word in the term tax incidence is *incidence*. Whether considering tax analysis, the term incidence suggests an analysis of who bears the burden of the tax mechanism under consideration. Samuelson (1973) suggested, in offering a perspective on tax incidence, that whoever pays the greatest proportion of the tax or who carries the greatest part of its burden is the taxpayer upon whom the incidence of the tax falls (p. 175).

**Regressivity.** *Regressivity* is traditionally used in finance and economics scholarship to refer to the propensity of the tax burden to fall unequally on those at the lower end of the income continuum. Samuelson (1973) has offered a comparison of different categories of taxes by suggesting that a ‘regressive’ tax … takes a larger fraction from low incomes than it does from [higher incomes] (p. 165).

Suits (1977a) quantified the relationship involving the tax rate compared to income level by developing the so-called **Suits Index for Tax Progressivity** [ranging] from +1 at the extreme of progressivity where the entire tax burden is borne by members of the highest income bracket, through 0 for a proportional tax, to - 1 at the extreme of regressivity at which the entire tax burden is borne by members of the lowest income bracket. (p. 747)
Suits (1977a) represented regressivity graphically by describing the relationship of the derived Gini (1921) coefficient and the Lorenz curve (1905). He suggested a regressive tax as being represented by a curve that falls above the theoretical curve of a proportional tax while a progressive tax curve falls below the proportional tax line of equity. Deriving this index will be taken up in the methods discussion in Chapter 3. A graphical representation of the cumulative tax plotted against the cumulative income is shown in Figure 3 adapted from Suits’ (1977a, p. 749) original work. The superimposed red line shown is added to Suits’ work to emphasize the line of proportional tax equity. A regressive tax would fall above the line of equity while a progressive tax would fall below, as suggested by Suits (1977a). The magnitude of the index is reflected in the curve of each line.

Figure 3 depicts six taxes and their relative tax incidence as constructed by Suits (adapted from Suits, 1977a, p. 749). As suggested, the red line illustrates the line of tax equity where at each point along the tax burden / total income continuum the total tax paid is neither regressive nor progressive. The three progressive taxes, the individual income tax, the property tax, and the corporate income tax all reflect a tax incidence that falls more heavily on those who have higher incomes. Conversely, sales and excise taxes, personal property taxes, and payroll taxes, are all regressive taxes which indicates that those less able to afford the tax bear its burden. Figure 3 displays the tax incidence relationship graphically which the calculation of the index takes into consideration with the area under the Lorenz Curve (represented by each tax). Areas above the line of tax equity return a negative Suits Index value while areas below the line of tax equity return a
positive Suits Index value. A more detailed explanation of the determination of the Suits Index is included in Chapter 3.

![Lorenz Curve for Six U.S. Taxes](adapted from Suits, 1977a, p. 749)

*Figure 3. Lorenz Curve for Six U.S. Taxes (adapted from Suits, 1977a, p. 749)*

In defining regressivity, Clotfelter and Cook (1989) examined “what criterion [is employed to] determine whether the implicit lottery tax falls disproportionately on the poor” (p. 222). The present study focuses on Clotfelter and Cook’s definitional approach involving “demographic [data]… [used] for judging whether lottery revenues come disproportionately from those at lower-income levels [as compared to] per capita expenditures over the income scale” (1989, p. 222). They summarized their definition of regressivity by suggesting that
The standard of comparison used in virtually all such studies is income. A tax is called regressive if, as a percentage of income, it falls as income increases, and a progressive tax is one that increases as a percentage of income as one moves up the income scale. The implicit benchmark is a strictly proportional tax (Clotfelter & Cook, 1989, p. 223).

**Progressivity.** In contrast to regressivity, *progressivity* refers to a tax that disproportionately falls on wealthier tax payers. Samuelson (1973) appropriately cautioned against confusion in understanding the term “progressive” when he suggested that “it would be wrong to read into the word ‘progressive’ emotional overtones of being up-to-date or particularly right-minded” (p. 165). Drawing from the idea of tax incidence, “[a] tax is … *progressive*… [if] it takes from high-income people…, a larger fraction of income, … than it takes from low-income people. While absent in most lottery scholarship, it is also important to note in the context of tax incidence evaluation that a proportional tax takes “the same fraction of income” from a tax payer regardless of income.

**Equity.** *Equity* begins by placing its meaning within the larger context of adequacy in public school finance. Toutkoushian and Michael (2007) traced the earliest consideration of equity in school finance to the same time that Ohio was considering the adoption of a lottery to meet its school finance difficulties (also see Rolle & Liu, 2007; Moser & Rubenstein, 2002). They suggested that early research was “conducted to examine whether school finance formulas were equitable from the perspective of the providers of education resources (taxpayers) and the recipients of education resources
(students and school districts)” (p. 396). For the purpose of the present study, equity refers to the degree to which those who are paying the lottery tax are contributing an equal amount (as a percentage) of their income.

**Horizontal and Vertical Equity.** Toutkoushian and Michael (2007) also offered definitions of horizontal and vertical equity. Horizontal equity suggests “that school districts considered to be similar to each other along dimensions that relate to the cost of providing basic education, such as wealth, size, and socioeconomic status, should have comparable levels of funding,” while vertical equity would imply “that for education funding to be equitable, school districts with higher costs to educate student populations should receive more funding than their counterparts to compensate for this difference; this is called the unequal treatment of unequals” (Toutkoushian and Michael, 2007, p. 396).

Rolle and Liu (2007) synthesized the work of Berne and Stiefel (1984) by arguing that

[horizontal equity is t]he act of treating students with similar academic qualities in the same manner in order to give them an equal opportunity to compete academically… [Vertical equity, however, is t]he act of treating students with different sociodemographic characteristics in a different manner in order to give them an equal opportunity to compete academically... (p. 329)

In operationalizing equity for the present study, Toutkoushian and Michael (2007) reminded us that “[a]lthough the notions of vertical and horizontal equity are straightforward, constructing valid measures of each has proven to be difficult” (2007, p.
They continued by relying on the work of Berne and Stiefel (1984) as an exemplar description of measuring horizontal and vertical equity. While specific ratios do exist, as Toutkoushian and Michael (2007) reported, the focus of the present study in defining and operationalizing equity is contingent upon the characterization of the lottery tax as either proportional, regressive, or progressive.

It should also be noted that wealth neutrality is not extensively considered in this discussion of equity because one of the major assumptions of wealth neutrality is “that no differences exist in educational expenditures because the wealth of the localities is equal” (Knoeppel, 2007, p. 424). Clearly DeRolph scholarship establishes that differences do exist in educational expenditures because the wealth of local school districts is not commensurate (McKinley, 2005).

It is also important to clarify that the definition of equity does not extend into considering what constitutes an adequate revenues and expenditure mix. Instead, the focus of this study is on the quantitative relationship between income and lottery tax contribution (in addition to qualitative considerations that will be detailed further in Chapter 3). While this study’s recommendations certainly will address issues of what ought to be, definitional analysis avoids linking equity and adequacy, heeding McKinley’s (2005) suggestion of leaving adequacy for a consideration in the “political arena” (p. 365). In other words, while a great deal of recent equity literature (Knoeppel, 2007; McKinley, 2005; Toutkoushian & Michael, 2007) linking equity and adequacy conceptually, this study’s analysis does not extend the discussion of equity to include adequacy.
In defining both regressivity and equity, the approaches used in this study were selected because of their likelihood to be more easily engaged by educational policymakers. Extending beyond the quantitative analysis of tax incidence is the presentation in this study of qualitative aspects of lottery play as they intersect with public education. The presentation is meant to be considered in conjunction with tax incidence analysis to allow for a more complete picture of the Ohio lottery as a mechanism of public finance policy.

**Elasticity Coefficient.** An *elasticity coefficient* is the value resulting from a regression equation where the values in the equation are calculated using “variables expressed as logarithms” (Price & Novak, 1999, p. 745). Price and Novak described (in the context of lottery research) that “estimated regression coefficients are income elasticity coefficients or ratios of the percentage change in lottery expenditures to the percentage change in the income measure” (1999, p. 745). The elasticity coefficient reports the percentage change in the dependent variable given a 1% increase in the independent variable holding all other variables in the equation constant. For example, Price and Novak (1999) suggested that for Instant games in Texas, the elasticity coefficient for income was -.450. This value suggests that as income (the independent variable of interest) increases 1%, Instant games sales decreases by almost half of 1%. In this case, as income rises, lottery purchases decrease. Wooldridge (2003) referred to this as a “log-log model” in his description of elasticity coefficients.
Statement of the Problem

Decades of lottery scholarship suggest that the implicit lottery tax burdens those most who are least able to afford its unlikely promise of financial return (Brinner & Clotfelter, 1975; Clotfelter & Cook, 1989; Koza, 1982; Livernois, 1987; Spiro, 1974; Suits, 1977b; Vaillancourt & Grignon, 1988). Clotfelter and Cook have suggested that “without exception, the evidence shows that the implicit tax on lotteries is regressive…” (1989, p. 223). However, little research has been conducted to understand the nature of the implicit lottery tax in Ohio. While the Ohio lottery is the focus of this study, the methodology presented is applicable to other states that offer a lottery to its citizens as a mechanism to fund public schools.

Research Questions

This study sought to address two research questions:

(1) In consideration of Ohio lottery sales as an implicit tax within the framework of the Suits Index for Tax Progressivity (hereafter referred to as the Suits Index), what is the tax incidence of the Ohio lottery for the years 1992 through 2010? How is this tax burden distributed among various demographic groups?

(2) What are the perceptions and understandings of Ohio’s public education stakeholders regarding the Ohio lottery and its role as a mechanism to fund public education in Ohio?
Significance of the Study

This study contributes to the field of school finance and economics research by exploring the relationship between the Ohio lottery as a school finance mechanism and school finance equity. While research on state lotteries and school finance equity is quite extensive, no research has been found that brings together these specific two areas for Ohio. A sizable amount of scholarship establishing the regressive nature of state-sponsored lotteries was completed in the decades immediately after the first wave of state lotteries began to produce data (Borg & Mason, 1988; Brinner & Clotfelter, 1975; Koza, 1982; Livernois, 1987; Mikesell, 1994; Oster, 2004; Price & Novak, 1999; Rubenstein & Scafidi, 2002; Spiro, 1974; Stranahan & Borg, 1998; Suits, 1977b; Vaillancourt & Grignon, 1988). This study adds to the existing lottery scholarship in an important way. First, the Suits Index for Tax Progressivity is calculated with confidence intervals from a longitudinal perspective. Second, elasticity coefficients are determined to identify specific lottery participants that have a greater propensity to contribute to lottery sales. Finally, to understand lottery tax incidence in greater depth, qualitative analysis explores cultural dimensions of lottery play from a participants’ perspective.

This study also offers an important new approach to measuring the impact of state lottery on school finance and economics that extends beyond the borders of Ohio. For the first time in the field of lottery scholarship tax incidence is measured over time both through the Suits Index and through double-log regression analysis. This analysis is also combined in a novel way with a qualitative approach through sociological analysis and interpretation. The application to states beyond Ohio allows policy makers to consider
whether their lottery finance mechanisms meet their political, economic, and social goals in the context of vertical equity.

The findings of this research study must be considered as well in the broader context of educational policy formulation in states that use a lottery to fund public education. Since no research has been completed connecting quantitative tax incidence data within the framework of cultural perspectives and assumptions of the lottery, policymakers have not enjoyed the luxury of these conclusions when determining appropriate policy adjustments. Within the context of attempts to address concerns highlighted by the school finance debate in Ohio, this study sought to contribute to efforts to more closely approximate an equitable framework for financing Ohio’s public schools.

Clotfelter and Cook (1989) argued that studying the lottery as a social phenomenon would provide a significant social benefit. They reasoned that “[l]otteries are important in public finance … because they engender controversy about the proper role of government” (p. vi). They continued by describing the social and economic benefits of studying consumer behavior. Most importantly they suggested that, “lotteries are worth studying … [because] their operation has important policy implications” (p. 12). Policy implications are at the forefront of the interpretation of the analysis. While the academic benefit to the field of educational research is significant, this study is specifically designed to encourage a consideration of the lottery as it intersects with the financing of Ohio’s public schools. The complete picture of finance equity cannot be drawn without knowing the tax incidence of lottery sales. At the same time, realizing the nature of the tax incidence does not by itself suggest the equitability of the lottery as a
school finance mechanism. Policy considerations in the context of the lottery can also raise questions about the extent to which the lottery contributes to increased income inequality (Freund & Morris, 2006).

Extending beyond the benefit to the public policy debate and the field of school finance and economics, the significance of this study to the field of the sociology of education should also be emphasized. Considering lottery finance requires an understanding of stratification (and its impact on academic achievement) described in the literature review of this study. In addition the contribution of understanding culture from a sociological perspective is important to grasp how lottery participants make sense of their participation in lottery play.

**Limitations of the Study**

Specific weaknesses present themselves as limitations of this study. The theoretical designation of the lottery as a tax, although widely accepted throughout school finance and economics scholarship, may not enjoy the same acceptance from policy makers. While arguments are presented in this study detailing the similarities shared between other consumption sales taxes, this study is limited to the degree that the lottery is accepted as an implicit tax. Data collection offers limitations to this study primarily through the use of zip code analysis to aggregate income and lottery sales data. Grubesic (2008) suggested the difficulties in aligning variable geographic zones concluding that zip code methodology may understate the impact of minority and less affluent consumers. The result would present a tax incidence calculation that marginalizes underrepresented groups’ demographic and sales data. Limitations of the Suits Index as a
point estimate measure of tax incidence are addressed through the employment of confidence intervals; however, the original dispersion of those point estimates cannot be captured with certainty outside of bootstrap methodology (Anderson, Shoemaker, & Roy, 2003, Combs, Kim, & Spry, 2008). Despite these limitations, the use of the Suits Index for Tax Progressivity has predominated in the field of tax incidence measurement for over three decades since its introduction (Anderson, Shoemaker, & Roy, 2003). A more comprehensive theoretical review of the limitations of the study is found in Chapter 2.

Qualitative limitations are also present in this study. The most pressing limitation is that, “[i]n qualitative inquiry, the researcher is the instrument” (Patton, 2002, p. 14). Patton posited that

[n]eutrality is not an easily attainable stance, so all credible research strategies include techniques for helping the investigator become aware of and deal with selective perception, personal biases, and theoretical predispositions (2002, p. 51).

The data collected in this study flow through the lens of the researcher with associated subjectivity. To address this limitation, Chapter 3 includes a consideration of the relevant characteristics of the researcher that could impact data collection, analysis, and interpretation.

**Delimitations of the Study**

This study uses census data disaggregated by zip code for both income and lottery revenue data and is therefore delimited by the data that those zip codes can provide for the state of Ohio. A more complete explanation of the methods is included in Chapter 3. However, it is important to note here that the data only includes census data for the state
of Ohio for the census year 2000 and lottery sales data by zip code from 1992-2010\textsuperscript{12}. This study is also delimited by participation in state-sponsored public lotteries. The study of illegal lotteries is not included in the analysis. The scope of the study is therefore bounded in time to those census periods included above and limited geographically to legal participants of Ohio lottery games residing in the state of Ohio. In addition to the quantitative delimitations, qualitative delimitations also present themselves in this study. Participation in the qualitative interviews is bound by the geographic area that can possibly draw respondents. The study is also delimited by the number of participants that can participate in the qualitative interview process.

**Organization of the Study**

To accomplish the objectives of this dissertation, this dissertation has been organized into five chapters. The first chapter presents a social, political, and economic history of the Ohio lottery in order to provide the context and discuss the significance of this study and research questions. The second chapter reviews relevant literature, including the historical development of the measurement of tax incidence beginning with Lorenz (1905) and Gini (1921) which constitute the theoretical foundation of Suits’ work. The second chapter continues with the introduction of confidence intervals as the most recent development in the evolution of the Suits Index in addition to a discussion of sociological aspects of lottery play. The second chapter concludes with an investigation of recent sociological literature in school finance equity along with contributions of the field of economic sociology to the understanding of the theoretical foundation of lottery

\textsuperscript{12} Pre-1992 data was not available from the Ohio lottery in a format that would facilitate use in this present study.
play. The third chapter includes an explanation of the methods employed to measure tax incidence of Ohio lottery revenue through the Suits Index and double-log regression analysis, in addition to a discussion of the qualitative methods used to collect data for examining the cultural implications of Ohio’s lottery tax incidence. The methods employed to collect, analyze, and interpret qualitative data is also included in chapter three. The fourth chapter presents the findings of data analysis. The fifth and final chapter presents a summary of the study including policy recommendations and suggestions for future research.
Chapter Two: Review of Literature

Introduction

Two major areas of scholarship are examined in this literature review including measurement of lottery tax incidence and sociological dimensions of lottery play. This includes a perspective of recent sociological literature in the field of educational inequity.

Tax incidence literature examined in this study considers two areas of lottery scholarship. First, recognizing how lottery participation has been measured from the perspective of tax analysis builds an understanding of how Ohio’s lottery revenues have been collected. Second, each facet of the literature presents the maturing development that tax incidence measurement has experienced over the last four decades. This understanding connects the literature existing in the field with methodology employed in this study with a focus on the study’s research questions. This scholarship contributes both a methodological and theoretical frame to this study.

The sociological aspect of lottery participation considers scholarship in the field of lottery participation, school finance equity, and cultural dimensions of economic sociology that contributes to an understanding of the lottery as a social institution.

Early Measurement of Lottery Regressivity

In one of the earliest ventures into the field of lottery tax incidence measurement, Spiro (1974) considered the issue of the distribution of the tax burden of the Pennsylvania state lottery. In framing his analysis, he disposed of the question of whether a state sponsored lottery qualified for consideration as a tax. He reasoned that the lottery provides a product which has an imposed excise tax that is employed to generate funds
for the state of Pennsylvania. In essence, Spiro (1974) argued, lottery profits are used to fund public interests and are therefore subject to analysis as any other tax would be.

The sample Spiro (1974) used was drawn from winners of lottery games. Lottery winners were sent a questionnaire to acquire the necessary data to calculate the lottery tax incidence. Nearly 300 lottery winners returned acceptable questionnaires that comprised Spiro’s (1974) data set. He concluded that, for the sample of lottery winners, the lottery was a regressive tax. Using regression analysis he determined that with an income elasticity coefficient less than one, the lottery extracted a tax that decreased as income increased. To test whether the sample was representative of the population, Spiro applied a Chi Square test which suggested that the sample and the population distributions were not statistically comparable. His conclusion was that for the sample, the lottery was a regressive tax, although for some portions of the income distribution, the lottery may be progressive. Spiro (1974) projected a distribution that foreshadowed the work of Suits (1977a; 1977b) by offering an accumulated income and lottery burden distribution.

Two contributions of Spiro’s (1974) early work considering lottery regressivity are important for this study. First Spiro offered a perspective considering the lottery as an implicit tax because of its purpose and function as a public funding mechanism. Next, Spiro employed the use of the Lorenz curve to illustrate how the distribution of income portrays the regressivity of the lottery tax.

Brinner and Clotfelter (1975) built on the work of Spiro (1974). By focusing their conceptions of lottery finance in the context of a supply and demand model where the state “creates” a product for “consumption” and then imposes a tax on that product, they
examined both the efficiency and tax incidence of the lottery as a funding mechanism (Brinner & Clotfelter, 1975, p. 395). In examining data from Connecticut, Massachusetts, and Pennsylvania (Pennsylvania data taken from Spiro, 1974), and Michigan, Brinner and Clotfelter (1975) found that the survey data pointed to a significant level of lottery regressivity. In qualifying their suggested level of tax regressivity, they recognized that “the full tax burden has been understated in the preceding analysis in that there has been no recognition that winnings are subject to… income taxation and that losses are deductible only up to the value of winnings” (Brinner & Clotfelter, 1975, pp. 399-400).

In realizing the limitations of using survey data, Brinner and Clotfelter (1975) also built a matrix for their analysis where income and lottery expenditures were separated into quintiles (p. 401). Both Massachusetts and Michigan revenue data were considered in this part of their analysis. Their conclusions suggested that “the five sets of data presented in this section [two individual Massachusetts data sets] constitute rather strong evidence of the regressive pattern of lottery expenditures” (p. 402).

In their concluding comments, Brinner and Clotfelter (1975) offered important insight into the arguments presented by lottery policy makers. They proposed that from lottery purchases, the revenue collected constitutes a regressive tax and is all the more objectionable in light of the fact that many states appear to have adopted lotteries rather than implementing or expanding progressive income taxes. By lowering the implicit tax rates on the purchase of lottery tickets, states could improve efficiency. And if individual demand curves have a similar shape
across income classes, lowering the tax rate would also increase the progressivity of net benefits obtained by ticket purchasers. (Brinner & Clotfelter, 1975, p. 402) The importance of this work to my study is their recognition of the importance of addressing concerns of regressivity through policy adjustments. They suggested one measure to address regressivity, namely “lowering the [lottery] tax rate” (Brinner & Clotfelter, 1975, p. 402). Other measures to address potential concerns with high levels of regressivity are investigated in greater detail in Chapter 5.

Suits’ (1977a; 1977b) early work in the field of tax incidence measurement reflects the development of a metric that not only suggested the magnitude of the tax incidence of lottery games, but also provided a tool to measure and compare lottery tax rates with other federal, state, and local taxes. This is an important milestone in lottery tax incidence measurement. For the first time in the decade after the lottery began to gain popularity a standard was established for the measurement of tax incidence that has continued to stand as the preferred measure of the distribution of tax burden among tax policy analysts (Anderson, Shoemaker, and Roy, 2003). Suits’ (1977a; 1977b) work went beyond employing descriptive statistical analysis and regression analysis by using a measurement tool adapted from its earliest permutations found in the field of economic inequality scholarship.

Suits (1977a) began by explaining that his effort to provide a single metric to measure tax progressivity was intended to fill a void in existing tax measurement scholarship. Suits built on the use of the Lorenz curve and the Gini Coefficient to create his index. As Suits (1977a) suggested, returning to the graphical explanation of income
distribution facilitates an understanding of how the curve shows a graphical representation of regressivity while the coefficient offers a metric for comparison. In his example, Suits used data from *Accumulated U.S. Income and Tax Burden by Population Deciles*, 1966 (p. 748). Suits (1977a) showed that income is disproportionately concentrated in the highest income deciles (p. 748). The lowest half of the accumulated percent of families earns less than a quarter of the total income while the top quarter of families earns over half of the income. Suits suggested, “[t]he greater the inequality of income, the farther the Lorenz curve” falls below the line of perfect equality of income distribution (1977a, p. 748).

Suits (1977a) explained that the distribution of income favors a smaller, wealthier percentage of families. In Suits’ (1977a) data, the lowest half of the family income spectrum represents less than a fifth of total income. The top ten percent of wealthiest families represents approximately over half of total income. Suits (1977a) used this illustration to explain how Gini Coefficient and the Lorenz Curve translated for his purposes through the Suits Index.

As Suits continued in his explanation of the contribution of Lorenz and Gini, he suggested that “the Gini ratio measures income concentration by the proportion of the area of the triangle $OAB$ that is contained in the sector bounded by the diagonal line $OB$ and the curve $OCB$” (1977a, p. 748). In other words, the larger the area between the 45 degree line of equality and the Lorenz curve, the greater the income disparity. This would translate mathematically into a larger Gini coefficient.
In applying the income concentration metric to tax progressivity measurement, Suits used “accumulated percent of tax burden [vertical axis]… plotted vertically against the accumulated percent of income [horizontal axis]” (1977a, p. 748). To illustrate his index he calculated the index values for taxes as presented in Okner (1976) and Pechman and Okner (1974).

In the first application of the Suits Index, Suits (1977b) employed his tax incidence methodology to determine the Suits Index value of gambling (part of which was lottery games) activity based on survey data collected “during the summer of 1975 by the Survey Research Center of the University of Michigan on behalf of the Commission for the Review of the National Policy Toward Gambling” (p. 19). As Suits described, the survey included nearly 2,000 national responses with a subset of responses of nearly three hundred Nevada respondents. In focusing on the lottery results of Suits’ analysis, he found that “[t]he regressive nature of lotteries as [a] revenue source is revealed by the fact that the percentage of total tax burden consistently exceeds the corresponding percentage of total income all the way through the income scale” (1977b, p. 25).

Suits’ results indicated that the Suits Index for state lotteries was -.31 (a regressive value) which was only exceeded in magnitude by the illegal numbers games and sports cards betting (1977b, p. 27). Suits’ Index provides a measurement tool whereby policy makers can compare various historical tax incidences. Throughout the next four decades, Suits’ Index would be used to generate comparative values of lottery tax incidence (Anderson, Shoemaker, & Roy, 2003).
Heavey (1978) expanded the measurement of lottery tax incidence both theoretically and methodologically. He began by describing his sense of the lottery tax, that is, as “an excise tax of approximately 80% levied on lottery tickets” (p. 417). Heavey (1978) used data from the Pennsylvania lottery in similar fashion as did Spiro (1974).

Data were collected from geographic areas based on 1970 census tract information. Heavey selected areas that he felt represented a variety of populations and areas within Pennsylvania (1978, p. 419). He suggested that

[i]t was reasonable to assume that if a given census tract accounted for one percent of the winning tickets in any time period, then it accounted for one percent of all the tickets sold during that time period… winning tickets represent a random selection of tickets sold. (1978, p. 420)

Specifically, demographic information was collected from the winners of the Pennsylvania lottery during the spring of 1972. Heavey’s analysis assumed that winners represented a reliable sample of lottery participation (1978, p. 420).

After screening his data, over 900 census tracts comprised his sample. Regression analysis was conducted to determine the influence of income, age, race, and education on lottery participation (1978, p. 420). Heavey (1978) found that the lottery excise tax was “moderately regressive” but reasoned that a part of that regressivity could be attributed to the “relative expenditures on lotteries and the consequent distributional effects” (p. 425). In other words, Heavey (1978) seemed to suggest that because incomes of lottery participants are stratified, even holding absolute participation constant will yield an excise tax calculation of regressivity because lower income participants will shoulder a
higher percentage share of the lottery tax. While lottery consumers may theoretically purchase the same quantity of tickets, Heavey (1978) suggested the percentage of that amount will still be reflected in a regressive tax because the same purchase amount in lower income groups is a higher percentage than it would be in higher income groups. In addition, Heavey found no significant contribution of race, age, and education to lottery purchasing behavior (1978, p. 424) in sharp contrast to later findings by Price and Novak (1999).

Heavey’s (1978) important theoretical contribution is his suggestion of the difference between absolute and relative regressivity. Not to be underestimated is the important methodological contribution he makes with the suggestion of census tract aggregated data. He also considered the possibility of measuring the budgetary incidence of the lottery tax, but marginalized this concept when he reasoned that “there is no connection between consumption of lottery and eligibility of program benefits” (p. 417). He continued by arguing that “[t]he programs financed by lottery … revenues have distributional effects, but these are something quite apart from the incidence of the lottery tax…, especially as these programs could be financed by alternative taxes” (p. 417).

With the initial framework of lottery profits considered as an implicit tax measured through regression analysis and calculated Suits Index values, the next decade of lottery scholarship established both lottery theory and measurement methodology.

Establishment of Lottery Regressivity Measurement

Clotfelter (1979) built on Suits (1977b) considering data from Maryland weekly lottery and daily numbers game drawings. This is one of the first instances where analysis
of individual lottery games is found in lottery scholarship. Important for this study is the
use by Clotfelter (1979) of zip code analysis in his aggregation of data. He reasoned that
zip code analysis is more precise than county level aggregation when he suggested that
“[z]ip code areas were used… because they are more numerous and much more
homogenous than counties” (1979, p. 544). His major concern in using zip code level
analysis was that zip codes may show median income of residents, but sales by zip code
cannot be assumed to perfectly correspond (p. 545). To negotiate these limitations,
Clotfelter (1979) employed three strategies beginning with an omission of “zip code areas
either touching or crossing over the District [of Columbia] line”, weighted regression
analysis where zip codes existed “with [a] relatively large ratio of commercial to
residential uses, and finally “[t]he third method used… was to eliminate the population
measure altogether by using ratios of daily to weekly sales” (p. 544). In other words,
Clotfelter’s (1979) third measure attempted to control for population.

In recognizing the primacy of the Suits Index, Clotfelter (1979) distilled the
Maryland lottery and daily numbers data to Suits Index values finding “that a state-
operated ‘numbers’ game has a revenue incidence [tax incidence] that is more regressive
than conventional weekly lotteries” (p. 547). He argued that the introduction of daily
numbers games contributed to the state “increasing the regressivity” of its gambling
revenue (1979, p. 547). It should also not go unnoticed that Clotfelter (1979) cautioned in
the footnotes of his work that the derived Suits Index only considers the “excise tax
implicit in lotteries” and does not consider “the possible offsetting distributional effect of
legalizing lotteries” (p. 547). Clotfelter (1979) seemed to suggest in his comments that
the tax incidence of the lottery is only a part of the equity equation when considering the impact of the lottery as a public finance mechanism (also see Guthrie, 1979). Clotfelter (1979) reported Suits Index values of -.41 for the daily numbers game and -.24 for the lottery drawing (p. 547).

Lottery product lines increased and sales quadrupled in the decade between the introduction of Suits Index and Clotfelter and Cook’s (1987) precursor to their comprehensive volume (see Clotfelter & Cook, 1989) considering lottery play in the United States (p. 533). To update lottery tax incidence scholarship in light of the diversified games evolving in the mid-1980’s, Clotfelter and Cook (1987) returned to the zip code analysis methodology provided in Clotfelter (1979). Collecting data from Maryland, Massachusetts and California, they suggested that lottery regressivity had continued to hover around the index values reported by Suits (1977b). They reported that “[b]ased on estimated household expenditures, the [Suits Index] values were -.42 for the 3-digit game, -.48 for the 4-digit game, and -.36 for the lotto. For the California instant game, the index was -.32” (p. 537).

Extending the consideration of regressivity beyond the Suits Index, Clotfelter and Cook (1987) suggested the importance of considering the dispersion of lottery purchases within income groups (p. 537). Their survey data reported that

[t]he 8 percent of the adult population that played the most during the sample period accounted for 60 percent of all purchases. The most active 20 percent accounted for 80 percent of purchases. Another survey of California lottery expenditures… yields similar results with the most active 10 percent of players
accounting for 64 percent of play. (1987, p. 537)

To offset the perceived dispersion bias, Clotfelter and Cook disaggregated the lottery data into quintiles and calculated the mean variables within each quintile (1987, p. 540). An important contribution to lottery scholarship is the question raised by Clotfelter and Cook (1987) when they considered other contributing factors of lottery play beyond income. They suggested that “it is interesting to know how participation varies with education, since lottery critics have charged that, with their relatively high takeout rates, lotteries prey upon the ignorance of bettors” (p. 541). They also included race in their consideration of other predictive variables suggesting that

[1]argest and most statistically significant among the explanatory variables is race… Lottery expenditures for whites and blacks tend to fall with [higher levels of] education. This effect is only significant for whites, with the difference between college graduates and those who did not complete high school being almost $5 per week. A similar pattern with smaller differences is observed for blacks, but due to the small sample the coefficients are estimated very imprecisely. Regarding age, the estimates imply that expenditures on lottery products are lowest for the elderly… Males spend more than females. Surprisingly, expenditures do not vary significantly between urban and rural counties once income, race, and the other characteristics are held constant.

(Clotfelter & Cook, 1987, p. 541)

In their concluding comments, they revisited their original research question which focused on the pursuit of an optimal level of taxation for lottery tickets. They suggested
“[w]hile it is incorrect to conclude that ‘lotteries are regressive’ the tax implicit in them certainly is. Any reduction in lottery tax rates would have distributional effects favoring those groups that play the most” (Clotfelter & Cook, 1987, p. 544). Their conclusion seemed to argue for the efficacy of policy changes to address lottery tax regressivity.

Considering both revenue and distribution incidence, Livernois (1987) provided a perspective of lottery participation based on data collected from Canadian consumers, specifically Edmonton, the capital city of Alberta. His sample was taken from “the annual survey… conducted by the Population Research Laboratory” (p. 341). Nearly five hundred respondents to the survey provided the foundation for the regression analysis (p. 341). The results indicated that “higher-income individuals and households are more likely to purchase lottery tickets but they spend a smaller share of their income on lotteries than lower-income purchasers” (1987, p. 342). This analysis supported the claim made by Heavey (1978) and further elucidated by Livernois (1987) describing relative lottery regressivity. “It is possible,” Livernois suggested, “that as a group lower-income individuals nevertheless tend to spend a larger share of their income on lotteries than higher-income individuals, thereby making lotteries a regressive means of generating public revenue” (p. 1987, p. 342). In addition to his regression analysis, Livernois also generated the Suits Index value from his data which was -0.10. This led Livernois (1987) to conclude that “the evidence… indicates that the Canadian lotteries… are less regressive in collecting revenues than their American counterparts” (1987, p. 344). It is also important to note that this difference in regressivity could either be due to the
distribution of the lottery tax burden or a variance in the income distribution between Canada and the United States.

In his concluding comments, Livernois (1987) raised an important question that has implications beyond his study. The data in Livernois’ work suggested that there is a marked difference between American and Canadian lottery tax regressivity. He used the value of the Suits Index to support this claim. He suggested that “future research on a theory of lottery … behavior … might provide an explanation for this difference [in regressivity]” (p. 349). The extended application would apply not only to differences highlighted by national boundaries, but also between different populations over time. Livernois pointed to the need for an explanation of lottery participation that explains differences in regressivity both between populations of the same time period and between the same populations over time.

Hansen (1995) represented a point of demarcation between single study lottery tax incidence scholarship and more comprehensive longitudinal and multi-state scholarship. Her work foreshadowed her more substantial contribution represented in Miyazaki, Hansen, and Sprott (1998). In her initial study, Hansen (1995) considered the tax incidence of one aspect of state sponsored gambling in Colorado, namely, the instant game. County level data was collected for 1990 and 1991. Hansen’s (1995) explanation of the calculated implicit tax rate was especially valuable. To derive the instant game tax rate she calculated “per capita instant game sales… as a percentage of income for six income classes” (1995, p. 387).
Hansen’s (1995) results suggested that “[t]here is evidence of instant game tax regressivity. Average ticket purchases as a percentage of income systematically falls as one moves up the income scale” (p. 388). Her regression analysis included a more complete list of contributing variables including education (high school and college attainment), race (Hispanic and African American disaggregated as opposed to white and non-white), and population density. She expended great effort to compare her findings to existing research in each non-income demographic area. To confirm the results of her analysis, she calculated the Suits Index as -0.095 which “[was] somewhat smaller (in absolute value) than the tax concentration indexes reported in previous studies of lottery tax incidence” (p. 390).

In her concluding comments she made important distinctions between her work and earlier lottery tax incidence scholarship. She recognized that both the infancy of the game under question – the instant game – in addition to the unique population demographics of Colorado – higher proportion of Hispanics, combined with a much less densely populated demographics – added to the differences in tax incidence between lottery states previously analyzed (1995, p. 396). She pointed to the work yet to be done studying lottery regressivity, which included a more comprehensive examination of lottery play over time and between different types of lottery games.

Longitudinal and Multi-State Regressivity Scholarship

Miyazaki, Hansen, and Sprott (1998) contributed in two major aspects to the field of lottery tax incidence scholarship. First, their review of lottery literature over the first quarter century of legalized state-sponsored lottery play is unparalleled. They examined
nearly thirty studies of lottery tax incidence and considered the placement of each lottery’s life cycle, in addition to data collection and methodology, and tax incidence (1998, p. 165). Their review of the literature was more than an exercise in placing their study within the larger body of existing lottery scholarship, but rather they used this review to generate data on the maturity of each state’s lottery to consider whether lotteries at different stages of their product life cycle reflected different tax burdens.\textsuperscript{13} Second, their work used calculated Suits Index values in conjunction with other “predictors” to determine the impact of those variables on the distribution of tax burden (1998, p. 167). Miyazaki et al. (1998) explained that “[a]dditional individual tests were conducted to determine longitudinal changes in lottery tax incidence, using as independent variables the actual calendar year… [indicating the position of the lottery on the product life cycle]… and the number of years of operation for each particular lottery” (p. 167).

The results of their analysis considering the relationship between the maturity of the lottery game in each state and its corresponding degree of regressivity suggested “that lotteries in their earlier years appear to be more regressive than more mature lotteries” (1998, p. 164). They correctly identified the limitations of their analysis of this relationship over time and between states when they suggested that “[a] problem with examining these data… is that they consist of tax incidence studies for different states, which makes comparisons of regressivity over time potentially meaningless if apparent changes in lottery regressivity are actually due to differences across states” (1998, p.

\textsuperscript{13} See Chapter 4 for a more detailed discussion of the life cycle of lottery products in the context of tax incidence.
This seemed to be what Hansen (1995) suggested in her work when she described the difficulties of measuring tax incidence between states with vastly different population demographics. Differing distributions of income can cause tax incidence measurement to vary greatly, even if the purchasing habits of respective income classes remained constant.

To compare regressivity over time between states, Miyazaki et al. (1998) generated Suits Index values based on accumulated lottery sales and accumulated income (p. 167). This approach varies slightly from Suits’ original work which focused on the accumulated percent of tax burden (Suits, 1977a; Suits 1977b). Their calculated Suits Index values were predominantly regressive ranging in California from -0.62 to -0.90; in Florida from -0.86 to -.152; in Indiana from +.003 to -.056; in Minnesota from -.125 to -.165; in Nebraska from -.087 to -.102; and finally in Oregon from +.006 to -.135. The conclusion was that “even when methodological procedures are held constant, variation in income-based lottery tax incidence is present not only across states, but also over time” (1998, p. 168). They continued suggesting that though the examination of lottery information from just one locale and at just one point in time may be useful for an understanding of buyer behavior, it is limited in its ability to predict the general state of affairs regarding lottery phenomena, particularly with respect to aspects such as tax incidence. (Miyazaki et al., 1998, p. 168)

Their argument suggested that the future of lottery scholarship should mature past examining single year, single game, and single state studies, but rather build towards
longitudinal, multi-state, multi-game studies. They proposed that “[a]t the very least, our research demonstrates the need for a shift from single time period research to research that involves multiple time periods, so that changes in lottery phenomena can be tracked and interpreted appropriately” (1998, p. 169).

Miyazaki et al. (1998) also suggested that “[b]ecause the Suits Index represents population data, no statistical test is needed to determine whether one value differs from another. Also, the shape of the curve may determine the nature of a particular degree of regressivity or progressivity” (Calmus, 1981 as cited in Miyazaki et al., 1998, p. 167). Their position is in sharp contrast to the work of Anderson et al. (2003) and Combs et al. (2008) as they suggested the importance of developing Suits Index values with corresponding confidence intervals.

Price and Novak (1999) brought together both methodological approaches (Suits Index and regression analysis) utilized in lottery scholarship to measure lottery tax incidence. By generating the Suits Index values in conjunction with regression analysis, they were able to construct a more complete picture of the tax incidence of lottery games in Texas for 1994 lottery revenue. They examined three traditional lottery product offerings including the instant game, lotto, and the pick three game using three measures of income including per capita income, median household income, and average family disposable income (1999, p. 744). In addition to the calculated Suits Index value, Price and Novak also developed a regression model with “per capita expenditures on individual lottery games… as dependent variables. Explanatory variables included per capita
disposable income; per capita expenditures on other lottery games; and demographic measures of education levels, minority populations, gender, and age” (1999, p. 744).

Another contribution of this study is the contribution to the understanding of the role of zip code analysis in the construction of Suits Index values. Price and Novak (1999) considered over fifteen hundred zip codes before screening the data in order to remove zip codes that “were either commercial, nonresidential areas or [zip codes that] shared a border with Mexico” (1999, p. 743). They removed zip codes that bordered other states and Mexico “because such areas are likely to experience a high incidence of out-of-area purchasers” (p. 743). This methodological decision is of greater interest when considered in the context of lottery states that share borders with states that promote similar, if not identical lottery product offerings. Price and Novak (1999) relied on Clotfelter (1979), Mikesell (1989), and Hansen (1995) to warrant screening out zip codes bordering non-lottery states.

In addition to the zip code methodology, Price and Novak (1999) introduced the concept of calculating a range for the Suits Index value based on three metrics for measuring income. They used “…per capita disposable income, … average family income, … and median household income” to build the upper and lower limits of their Suits Index range (Price & Novak, 1999, p. 744). The results from this analysis suggest that median income offers the lower end of the Suits Index value range while per capita income and average family disposable income are nearly identical. The summary analysis showed the instant lottery tickets to be the most regressive form of lottery play ranging from -.36 to -.38 Suits Index while the Pick 3 is slightly less regressive with a Suits Index
range of -0.32 to -0.034. The lotto was the least regressive with a Suits range of -0.20 to -0.21 (Price & Novak, 1999, p. 744). Price and Novak employed regression analysis to confirm the results of the Suits Index values (1999, p. 746, p. 749).

Not to be underestimated is the contribution that Price and Novak (1999) made to the understanding of the role that Hispanic and African American populations play in lottery purchasing activity. They suggested that both groups contributed disproportionately to lottery participation, with African Americans participating more than Hispanics. They concluded their work by proposing that

[t]he results of our research seem to confirm the fears of lottery critics. All of the Texas lottery games are found to be regressive. Accordingly, lower income groups spend a larger portion of their income on lottery products than do higher income groups. When the games are examined individually, it becomes apparent that the more regressive the game, the more it is supported by the poor, Blacks, Hispanics, the poorly educated, and the elderly. (Price & Novak, 1999, p. 749)

With an understanding of the first four decades of lottery tax incidence measurement in place, the review of literature moves to a consideration of more contemporary lottery scholarship.

**Contemporary Lottery Regressivity Literature**

The most recent lottery scholarship reveals a specialization of lottery analysis not experienced in earlier periods of lottery tax incidence measurement. Beginning with Oster (2004) an examination of Powerball tax incidence suggested a point at which
lottery play could become a progressive form of taxation, which is in sharp contrast to the overwhelming abundance of literature from the first four decades of lottery tax incidence measurement. Drawing on Powerball sales data from Connecticut, Oster (2004) utilized zip code analysis to conflate both sales by zip code and revenue by zip code. The novel nature of the data set allows for a consideration of tax incidence for each Powerball drawing. While the demographic data provided by the census represent a fixed data set, the Powerball sales data changed with each bi-weekly drawing.

Oster (2004) completed regression analysis to determine price elasticities over time in the context of jackpot size. While it is certainly of interest that her analysis does not include a calculation of the Suits Index values, her explanation of the interpretation of price elasticities help to support her claim that at around $800 million the lottery would become a progressive public finance tool. She offered that

[t]he decreasing regressivity of the lottery with the jackpot size is further illustrated … [by] the income elasticity of sales [as] graphed against jackpot size… It is easy to see that the elasticity is increasing as jackpot size increases.

(Oster, 2004, p. 183)

Oster (2004) concluded her work by considering the feasibility of an $800 million lottery jackpot. She suggested that the history of lotteries offering $300 million jackpots in conjunction with the possibility of a national lottery bring the reality of such a large jackpot into full focus (p. 185). In addition to Oster’s (2004) contribution using Powerball data, her study also contributed to the understanding of zip code analysis in lottery tax incidence measurement. She addressed the question of whether lottery
consumers cross over between zip codes for lottery purchases confusing the relationship of where a consumer lives and where lottery tickets are purchased. Oster (2004) suggested that, based on a 1999 National Gambling Impact Study, “ticket purchases are generally made close to home. When lottery-playing individuals were asked if they bought their lotto tickets in their neighborhood, 84 percent of people who played more frequently than once a year said they did” (pp. 184-185).

The most recent lottery tax incidence scholarship represents a sophistication of methodology pursuant to four decades of use of the Suits Index for regressivity measurement. Combs, Kim, and Spry (2008) examined data from the Minnesota lottery. They utilized the work of Anderson, Shoemaker, and Roy (2003) to “construct confidence intervals for Suits Indices of seven lottery products” (2008, p. 35). After applying Anderson et al. (2003), they found that “games offering instant gratification are more regressive than those offering long odds and large jackpots… Policy makers may benefit from an understanding that the characteristics of lottery products can affect the overall regressivity of a state’s taxation system” (Combs, et al., 2008, p. 39). Despite the widespread use of the Suits Index (Anderson, et al., 2003) and regression analysis to determine tax incidence, there are certainly theoretical limitations to tax incidence measurement that deserve mention in the context of lottery scholarship.

**Theoretical Limitations of Tax Incidence Measurement**

Limitations present themselves in the data collection from both U.S. Census Bureau and the Ohio Lottery Commission. The collection of data was based on the use of zip code analysis. Grubesic (2008) offered important insights into the limitations that zip
code analysis presents. Grubesic argued that zip codes provided by the U.S. Postal Service (used for lottery sales data) and those offered by the U.S. Census Bureau do not necessarily include the same “boundaries” (2008, p. 139). He suggested that there are, in fact, a number of clear differences between the two boundary files. First, while the GDT [Geographic Data Technology] file contains 1220 five-digit zip codes [in Ohio] (with no duplicates), the ZCTA [Census-defined zip code tabulation area, emphasis added] file has 1469. A portion of this difference can be attributed to the fact that many ZCTAs include separate zip codes for sparsely populated areas of Ohio. As noted …, there are large undeveloped areas where no MAF [Master Address File] addresses exist with five-digit zip codes. In these cases, the Census assigns ZCTAs based on the three-digit zip code (e.g. 430HH). For the state of Ohio, there are 126 cases where a three digit code is used, primarily consisting of lakes, rivers and other waterways. (Grubesic, 2008, p. 139) Grubesic concluded that “[t]his circumstance surely complicates any attempt to make a comparative analysis between studies using incongruous boundary files” (p. 139). While this has a significant impact in the private sector (rate determination in the insurance industry, for example), by extension Grubesic’s work cautioned that “zip code-based ratemaking [statistical analysis] discriminates against minorities and those with lower socioeconomic standing” (p. 146). Analysis is [further] complicated and limited by the fluid nature of zip codes and the definitions used for Census data collection as the data is collected over multiple collection periods (Grubesic, 2008; Ruggles & Brower, 2003, as cited in Grubesic, 2008). The consumer behavior of the populations that make up zip
codes changes over time as those same consumers move between zip codes and income groups. The same consumer could be reflected in differently categorized zip codes in each census or in different measurement cases. Recognition of this limitation is important when considering the implications of the results of the Suits Index.

In addition to considering the lottery a tax and using zip code analysis, there are limitations that are intimately connected with the methods employed to measure regressivity of lottery revenue. Suits’ (1977a) methods for measuring regressivity were met with criticism very quickly after their publication. Davies (1980) suggested that by using average salary data, Suits failed to give an accurate snapshot of regressivity. He proposed that consumption studies show that the lowest economic classes consume more than they earn which supports the claim that “annual income is not a very useful indicator of the economic well-being of the family” (p. 204). Davies reasoned that “annual income figures tend to understate the long-run incomes of current low-income earners; while at the same time they tend to overstate the lifetime incomes of those individuals who currently receive high incomes” (1980, p. 204). His solution was found by measuring data that did not exist. He suggested that “[i]ncidence and equity can be best measured by comparing different individuals’ ratios of lifetime taxes paid to lifetime income earned…” (1980, p. 205). While he realized the impracticality of such a suggestion, he offered other measurement tools that considered a protracted period of time. Davies’ second major criticism of Suits involved the definition of income. He argued that income should include government subsidies to truly reflect income received. Davies’ final critique of the Suits Index involved the ability of the graphically represented curve to
vary in progressivity over decile increment. He accurately suggested that “[the] index does not reveal information about the skewness [skedacity] in the distribution of income nor the number of people or families subject to progressivity, and this lack of evidence could cause the policymaker difficulty” (Davies, 1980, pp. 206-207). Zip code cases do not reveal dispersion because data is aggregated and compared to the total tax collected. A more detailed explanation of the arrangement of the data to construct the Suits Index is contained in Chapter 3.

In addition to Davies’ suggested limitations of the Suits Index, Kienzle (1980) proposed limitations to its measurement of tax incidence. He argued that the assumptions of the Suits Index allow for great sensitivity of the index to changes in the way that taxes are compared and considered based on “tax incidence assumptions” (p. 208). Since Suits relied on the cumulative percentages of tax rates, variation in those assumptions, as suggested by Kienzle, “is indeed sensitive to the choice of an alternative set of assumptions” (p. 209). These assumptions are extensive in the data that both Suits and Kienzle considered (Pechman & Okner, 1974).

Along with the limitations of the Suits Index, as stated by Davies (1980) and Kienzle (1980), research that has employed the Suits Index has also considered the limitations of the application of his metric. Since the Suits Index is a result of median family income, aggregate family income and lottery taxes paid, the index gives us no hint as to the dispersion of each variable (Anderson, Shoemaker, & Roy, 2003). This also hinders the ability of the index to offer insight into the way in which the tax incidence contributes to income disparity (Seetharaman & Iyer, 1995).
Seetharaman and Iyer (1995) focused on the limitations of the Suits Index from the perspective of their work which measured the impact of the Child and Dependent Care tax credit. While they acknowledged a “heavy reliance” on the measurement of tax incidence using the Suits Index (p. 43), Seetharaman and Iyer argued (1995) that Suits’ work fails to include any indication of how the index suggests disparities in income distribution. The importance of this limitation, they argued, is that “a tax that is more progressive than another will not necessarily reduce income inequality” (Seetharaman & Iyer, 1995, p. 43). Because of this limitation of the Suits Index, they categorized the Suits Index as a “progressivity index” that is “based on the ability-to-pay principle” which is in sharp contrast to the other two categories of indexes which “deal with the effect of tax progressivity on income inequality” (Seetharaman & Iyer, 1995, p. 51). In applying their data to the Child and Dependent Care tax credit, Seetharaman and Iyer revealed an additional limitation of the Suits Index, namely, the difficulty found in interpreting the index when the curve generated by cumulative percentages of tax and income crossed the line of a proportional tax. They suggested that “if a tax system causes intersections, the numerical value of the progressivity index cannot be unambiguously interpreted” (Seetharaman & Iyer, 1995, p. 66).

As they described the limitations of the Suits Index, Anderson, Shoemaker, and Roy (2003), reaffirmed the argument of Seetharaman and Iyer (1995) of the failure of the Suits Index to capture the variations of tax progressivity and regressivity along the curve measuring the relationship between income and tax burden. Anderson et al. (2003) argued that “[a]s a summary measure of the progressivity of a tax system, the Suits Index
is incapable of capturing subtleties that require information about higher moments of the tax distribution” (Anderson et al., 2003, p. 84). They suggested the difficulty the Suits Index presented in comparing the index values over time due to “unobserved confounding variables” (Anderson et al., 2003, p. 85). They argued that without employing confidence intervals, small changes in the index over time may not accurately represent the changing progressivity of the tax. Their suggestion was that “[u]nless a test of significance for the Suits Index is used, speculation on significance may lead to wrong conclusions” (Anderson et al., 2003, p. 85). While the Suits Index may offer a snapshot of progressivity of a specific tax at a fixed point in time, a significant limitation of the Suits Index is its inability to provide (outside of confidence intervals as described in Chapter 3) a reliable comparison of the index over time.

Since the Suits Index uses averages from each zip code (case) in its analysis, it is conceivable that zip code averages may not present a clear picture of lottery activity within that income group. Individual or syndicate purchases of a substantial nature could cause the mathematical average to be misleading as a representation of that case’s purchasing habits. In addition, the average would then also confuse the index calculations providing a measure that is not reflective of the consumer behavior of that zip code. As the Suits Index is used comparatively over time or as a measure against other variables this error is compounded. This helps explain Formby, Seaks, and Smith’s (1981) suggestion of significant variability in the measurement of tax progressivity between various indices.
With an understanding of lottery scholarship completed, a review of the position of the lottery within the field of sociology follows. This review considers the larger context of school finance inequity within the field of sociology in addition to the treatment of the lottery in economic sociology. Considering the literature within the field of sociology builds an understanding of how lottery participation can be viewed from a theoretical perspective. This review builds on the introduction of sociological theory of stratification and funding disparities from Chapter One connecting sociological theory in general to a specific link with economic sociology and lottery participation as it intersects with school funding.

**Economic Sociology and Lottery Play**

Economic sociology, as a theory to understand social behavior, “combine[s] the analysis of economic interests with an analysis of social relations” (Swedberg, 2003, p. 1). This perspective offers an important theoretical frame for understanding the cultural dimensions of lottery play to be investigated in the second research question. Focusing economic sociology theory on lottery play allows for a consideration of participation within a cultural context. More precisely, as Swedberg suggested “[o]ne reason for proceeding in this way is that the concept of culture can illuminate the fact that phenomena such as buying, selling, and consuming can be properly understood only if their meaning is taken into account” (2003, p. 250). Understanding the meaning that different groups attribute to lottery participation can help to develop an understanding of what drives a differential tax incidence. Historically, as outlined in the economic and finance scholarship describing income and lottery participation, lower income groups
participate disproportionately in lottery play. Outlining a perspective of economic sociology as it relates to lottery consumption can then be analyzed through the lens of culture to understand the “meaning” that participants attach to their behavior. “Consumption,” however, as Swedberg cautioned, “is more than a semiotic game of meanings; it is sturdily anchored in a system of social relations…” (2003, p. 250).

This symbolic interactionist perspective should also be considered in conjunction with rational choice theory. Scott (2000) outlined an important framework of rational choice theory that deserves attention. Scott argued that “[b]asic to all forms of rational choice theory is the assumption that complex social phenomena can be explained in terms of the elementary individual actions of which they are composed” (2000, p. 2). Scott continued as he offered a sociological perspective of rational choice theory where

… individuals are seen as motivated by the wants or goals that express their 'preferences'. They act within specific, given constraints and on the basis of the information that they have about the conditions under which they are acting. At its simplest, the relationship between preferences and constraints can be seen in the purely technical terms of the relationship of a means to an end. As it is not possible for individuals to achieve all of the various things that they want, they must also make choices in relation to both their goals and the means for attaining these goals. Rational choice theories hold that individuals must anticipate the outcomes of alternative courses of action and calculate that which will be best for them. Rational individuals choose the alternative that is likely to give them the greatest satisfaction. (2000, p.3)
The rational choice theory framework, as outlined by Scott (2002), may be applied to the qualitative elements of this study as an effort is exerted to understand how respondent make sense of their lottery participation.

Swedberg’s (2003) outline of the classical sociological contribution to understanding economic theories of consumption is important to highlight. Swedberg (2003) may consider Marx’s contribution to be “marginal” to understanding consumption and culture, however, there remains important understandings to be gleaned from a Marxist position. These contributions include a realization that different classes may be unaware of the “exploitative process” of consumption and that consumption can satisfy varying needs. The question prompted by Marx’s work to consider is what needs are being satisfied and to what degree consumers are aware of the process in place for the consumption of lottery products.

Swedberg (2003) argued that Weber’s understanding of culture and consumption is distinctly different from that of Marx. He suggested that Weber’s notion of “consumption” is aligned to a “style of life” in which “[p]eople in a social class will typically try to limit competition and develop status groups; and if they are successful in this, ‘economically irrational consumption patterns’ will emerge” (Weber, [1922], 1978, p. 307 as cited in Swedberg, 2003, p. 251). If Swedberg were to extend Weber’s argument, it would not be difficult to envision how lottery play could be connected to “economically irrational consumption patterns” that exist in different social classes. To more fully appreciate how culture and consumption intersect, Swedberg offered the work of Bourdieu as “[o]ne of the most significant contributions to economic sociology…
which includes his [Bourdieu’s] thinking on the theme of culture and the economy” (p. 241).

Swedberg introduced key definitions used throughout Bourdieu’s work that frame how Bourdieu envisions the relationship between economic behavior and culture. The first concept that Swedberg offered to aid in understanding the relationship between economy and culture, based on Bourdieu, is that of habitus. Relying on Bourdieu’s definition of habitus from a qualitative analysis of Algerian economic behavior, Swedberg suggested that the habitus “orients and organizes the economic practices of daily life – purchases, saving, credit – and also political representation, whether resigned or revolutionary” (Bourdieu, 1979, pp. vii-viii, as cited in Swedberg, 2003, p. 242).

Daberkow (2007) outlined Bourdieu’s offering of habitus in suggesting that

[f]or Bourdieu, the habitus is ‘the product of internalization of the principles of a cultural arbitrary capable of perpetuating itself after [formal educational processes have] ceased and thereby of perpetuating in practices the principles of the internalized arbitrary’ ([Bourdieu], 1990, p. 31). The habitus then is the internal rules whereby the practical requirements of structural necessity are manifested. In continuing his explanation of habitus as a force driving social activity, he suggests that the productivity of the educational process is ‘a function of the distance between the habitus it tends to inculcate… and the habitus inculcated by all previous forms… and, ultimately, by the family…’ (p. 72)… Bourdieu further defines habitus and adds meaning to its functional mechanisms. Attitudes and aspirations are part of the individual’s habitus as they are initially transferred by
the family and subsequently encouraged through the students’ participation in the educational process. (p. 10)

Swedberg moved from a consideration of habitus to a discussion of the role of cultural capital as advocated by Bourdieu (and considered earlier by Roscigno et al., 2006). It is with the introduction of cultural capital that the intersection between economic behavior (lottery play) and education is illuminated. Swedberg’s commented on the significance of extending the examination of lottery finance into the field of social reproduction theory.

In synthesizing the work of Bourdieu, Swedberg observed that cultural capital can help explain the “role education plays in reproducing the class structure” (2003, p. 243). Briefly summarizing the role of cultural capital in educational institutions, Swedberg argued that “[w]hat is usually explained by referring to ‘ability’ and ‘talent,’… can be much better understood as the results of a cultural capacity that some students have been taught by their parents…” (p. 243). While Swedberg had individual students in mind when he considered how cultural capital is transferred from parents to children through family systems, consideration of the tax incidence of the lottery focuses on the lottery consumer.

Translating the concepts of habitus and cultural capital to lottery players extends Bourdieu’s theory of the reproduction of class differences to include the finance mechanisms in place to fund schools. Lareau (2003) offered an important perspective within an American context of Bourdieu’s application of habitus and cultural capital when she suggested that
The notion of habitus stresses the set of dispositions toward culture, society, and one’s future that the individual generally learns at home and then takes for granted. Bourdieu suggests that differences in habitus give individuals varying cultural skills, social connections, educational practices, and other cultural resources, which then can be translated into different forms of value (i.e., capital) as individuals move out into the world. (p. 176, as cited in Daberkow, 2008, p. 18)

Sociological theory helps to inform the consideration of lottery tax incidence in an important way. While economic and finance literature help to understand who historically participates in the lottery, sociological theory provides a theoretical framework to consider the differences in lottery participation between economic and social classes.

While Swedberg (2003) offered an overview of the contribution of economic sociology to an understanding of culture and lottery participation, Levin (2008) offered an important and more specific contribution in his perspective of how economic sociology grapples with culture. Levin (2008) theorized that “Max Weber’s work focused on the elective affinities between culture, religion, and the development of economic systems, and Marx’s work demonstrated the fundamental connections between relations of production and the dominant conceptual tools of the day” (p. 114). From this point of departure, Levin (2008) argued that economic sociology “approaches culture in a less fruitful and less integrative fashion” (p. 115) than does “sociology’s classical theories” (p. 114) which prompts his projection of an approach to culture and economic activity.
The two approaches that Levin (2008) suggested fail to represent an adequate representation of culture in economic sociology. On one end of the spectrum the position suggests that “[r]ationality, calculative agency, and commodities are outcomes of cultural processes. These are ways that culture is used to explain how markets take shape” (p. 116). The opposite end of the spectrum is that “[c]ultural effects are portrayed as being outside of or exogenous from markets… Culture affects how they [markets] work but not their construction” (p. 116). Drawing on the work of Zelizer (2005), Levin synthesized Zelizer to suggest “that people differentiate meaningful social relationships using a variety of media, including money. Economic exchange [as exemplified in lottery participation] is a potential boundary marking enterprise…” (2008, p. 125). Continuing his reliance on Zelizer to offer a more integrative perspective of cultural and economic activity Levin (2008) suggested the importance of “understand[ing] the myriad ways that people mark money, children, life, and intimate transactions using economic and noneconomic means” (p. 126). Lottery participation can then be theoretically viewed through the lens of culture in the context of economic sociology.

**Sociological Theory and Lottery Play**

Garvía (2007), in his explanation of syndicate lottery play, outlined a variety of sociological perspectives of lottery play. In doing so, Garvía (2007) found a contradiction in modern sociological thought that refuses to see lottery play as rational, instead relying on deviance as an explanatory theory of lottery participation. He further envisioned a difference in rationales for lottery participation between economic classes. Positioning “frustration and desperation theories” (p. 608) with the working poor and recreational
purposes as potentially motivating wealthier economic classes, Garvía (2007) suggested that current lottery theory relies too heavily on individual theories of social activity (p. 607). Garvía further argued that the sociological literature maintains a focus on the characteristics of lottery players instead of a more anthropological focus on “where gambling has commonly been interpreted as an arena where social positions can be negotiated and group allegiances enacted” (2007, p. 607). Garvía highlighted the contribution of qualitative sociological literature “where it has been reckoned that social bonds can partially account for both participation and level of play” (2007, p. 607; see also, as cited in Garvía, 2007, Rosecrance 1986; Herman 1967; Zola 1964).

Garvía (2007) offered two important exceptions to the social relationships contributions of sociological scholarship. The work of Light (1977) and Adams (1996; 2001) are discussed for their contribution to the understanding of lottery play within the context of social relationships. He suggested that Light’s (1997) research on the operation of illegal numbers in a slum showed that social relations, in the form of interpersonal trust between runners and players, as well as a community spirit and race pride among dwellers, were critical to the operation of the lottery. (Garvía, 2007, p. 607)

Garvía continued by highlighting the most recent contribution of Adams (2001) which “emphasizes the social dimension of lottery play by pointing out the way players commodify their lottery tickets by selecting numbers that make reference to their primary networks of social relations (e.g., wedding anniversaries or birthdays)” (Garvía, 2007, p. 608).
To focus the lottery discussion on social relationships, Garvía’s (2007) work considered the phenomenon of syndicate play, that is, the activity of lottery consumers when pooling their money to make group purchases of lottery tickets with the implicit agreement to share any winnings. While his analysis is focused on European lottery data, his conclusions inform this work as he suggested that a social practice can become institutionalized in a manner that such a taste, or the kind of behavior that conveys such a taste, is nourished… [T]he analysis shows that networks of social relations originating in an economic necessity persist even with rising incomes and well-being and continue to have an impact on economic decisions and outcomes. (Garvía, 2007, 609)

Garvía’s (2007) analysis of European qualitative data collected in 2005 informs this study in an important way. He suggested that rather than motivated by purely economic or instrumental reasons, syndicate playing is part and parcel of an institutionalized social practice: a routine or tradition by which Spaniards feel compelled to abide either passively or actively… (Garvía, 2007, p. 642)

While focusing on syndicate play in Europe, his work is valuable as it contributes to the discussion of the social dimensions of lottery play in Ohio. However, despite this contribution, extending the lottery play connection to education has not been explored in sociological scholarship. In relating his work on syndicate lottery play to the present examination of the tax incidence of Ohio lottery games, Garvía suggested [o]n the one hand, syndicates can allure into the game the relatively wealthy
and make lotteries be less regressive. On the other hand, they can entice, 
lock in, and increase the level of spending of the relatively poor and 
produce more regressivity. Research is needed to adjudicate between these 
two possibilities so that both scholars and policy makers can evaluate this 
issue from a new perspective. (2007, p.645)

While Garvía (2007) offered an empirical analysis of syndicate lottery play to inform 
policy and build theory, Condron and Roscigno (2003) presented a case within a 
sociological framework for the examination of the inequity of school funding describing 
the distribution of school district resources.

**Summary of Literature**

Lottery scholarship representing four decades of research overwhelmingly 
supports the claim that state-sponsored lotteries are disproportionately supported by 
consumers representing the lower groups of income earners. More contemporary lottery 
scholarship strongly suggests that minorities and consumers with less education also 
contribute disproportionately to lottery profits. Lottery scholarship also offers a 
disaggregation of lottery games emphasizing the theory that instant reward lottery games 
are more regressive than lottery products that offer longer odds and higher jackpots. 
Positioning of lottery games along the product life cycle curve has produced ambiguous 
results within the context of tax incidence measurement.

Outside of the pilot study work for this dissertation (Daberkow, 2009a; 2009b), no 
published research to date has examined tax incidence of the Ohio lottery. Relatively 
little is understood about the divergent meanings that economic and social classes place
on lottery participation. These meanings drive lottery participation (or non-participation); yet have not been examined in sociology scholarship. Very little is known about the demographic composition of those who play the Ohio lottery and the corresponding tax incidence of the Ohio lottery as it has developed over time. Even less is known about the beneficiaries of Ohio lottery profits. Finally, in the context of the Ohio lottery, there is no research known that seeks to offer a qualitative perspective on lottery participation as it intersects with education. The review of literature informs the following research questions that serve to guide this study:

(1) In consideration of Ohio lottery sales as an implicit tax within the framework of the Suits Index for Tax Progressivity (hereafter referred to as the Suits Index), what is the tax incidence of the Ohio lottery for the years 1992 through 2010? How is this tax burden distributed among various demographic groups?

(2) What are the perceptions and understandings of Ohio’s public education stakeholders regarding the Ohio lottery and its role as a mechanism to fund public education in Ohio?
Chapter Three: Methodology

The review of literature overwhelmingly points to a gap in the lottery scholarship describing the tax incidence of the Ohio lottery. Understanding who bears the burden of the Ohio lottery has important implications for developing a school funding policy that collects public funds in an equitable manner. The significance of school finance equity cannot be understated as public schools offer the potential both within and outside of classroom walls to act as either an agent for social mobility or as a vehicle for unequal social reproduction. This context prompts the research questions considered in this study:

(1) In consideration of Ohio lottery sales as an implicit tax within the framework of the Suits Index for Tax Progressivity (hereafter referred to as the Suits Index), what is the tax incidence of the Ohio lottery for the years 1992 through 2010? How is this tax burden distributed among various demographic groups?

(2) What are the perceptions and understandings of Ohio’s public education stakeholders regarding the Ohio lottery and its role as a mechanism to fund public education in Ohio?

Tax Incidence: Design of Study

The design of the study to measure the tax incidence of the Ohio lottery follows the framework of a correlational analysis. Dooley (2001) suggested that “[c]orrelational designs use causal variables that we measure rather than manipulate. We observe variables taking their natural values rather than fixing them as in experiments” (p. 226). It should be noted that a correlational analysis does not imply that a statistical correlation is
employed but rather the Suits Index and double-log regression were used to evaluate tax incidence. The variables measured here are lottery sales and family income, in addition to age, educational achievement, and race. Lunenburg and Irby (2008) allowed for a less restrictive definition of a correlational design when they suggested that “[c]orrelational research is based in ‘relationship’… [and] is grounded in interactions of one variable to another” (p. 35). Family income is measured in two ways, including median family income and aggregate family income, as in Suits’ (1977a) early work outlining his index which measured gambling tax incidence. Lottery tax paid was considered as the total cost of the ticket. No distinction was made between games to consider varying take out rates (administrative costs such as prizes as a percentage of tickets as compared to the total cost of the ticket). Other demographic variables are measured as defined by U.S. Census protocols and described in Price and Novak (1999).

Identification of the sample and the population is a point of some contention within the field of lottery tax incidence measurement. For this study the sample was drawn from the entire population of the state of Ohio. U.S. Census data included all of the zip codes in Ohio, while lottery sales included all of the zip codes in Ohio that contain lottery retail outlets (as suggested in Price & Novak, 1999, and Hansen, 1995). Through the process of screening the data a sample of the total population is created from zip codes that contain both zip codes included in census reports and lottery retail outlets. Combs et al. (2008, via personal communication with John Spry, 2009) considered this a “pseudo-sample” drawn from the population. The importance of the use of a sample in calculation of Suits Index confidence intervals was considered in Daberkow (2009a).
Tax Incidence: Data Collection

Two data sets were created in calculating tax incidence. The first data set presented a comparison of the two variables, family median and aggregate family income and lottery sales (each individual game with a calculated tax incidence). Both income and lottery sales were sorted by zip code for analysis. Median family income and aggregate family income (in addition to other demographic variables) is available from the U.S. Census Bureau created online through the use of the customized SF-3 file. Census data was collected from the 2000 Census for comparison with all lottery years. Lottery sales were collected for each year from 1992 through 2009. Lottery sales were conflated with the census data as suggested by Oster (2004), Brinner and Clotfelter (1975), and Mikesell (1989). The second data set, also constructed from Ohio lottery annual sales data conflated with U.S. Census Bureau data files, brought together annual lottery sales by game and zip code with demographic variables as suggested by Price and Novak (1999).

Calculating Tax Incidence

Analysis of the two data sets as described began with the use of the Suits Index for Tax Progressivity (Suits, 1977a). Statistical analysis was completed through the use of R Statistical Package (2008) as employed in Daberkow (2009a, 2009b) with code written by Dr. Lin Wei of Ohio University. The Suits Index for Tax Progressivity was employed in this study for two reasons. First, the Suits Index remains the most widespread measure of tax incidence applied not only in lottery tax incidence measurement, but also in other federal, state, and local tax policy analysis (Anderson et al., 2003). Second, the Suits Index offers a simple yet readily transferable metric of tax

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14 For more information about the open-source R Statistical Package at http://www.r-project.org/.
incidence analysis whereby taxes of differing origins can be compared as a summary (point estimate) measure of the distribution of a tax burden. Policy analysts can consider the evolution of the Suits Index under various proposed tax options to allow for tax burden to be considered in their decision making.

The Suits Index was calculated by plotting the accumulated aggregate family income (ranked in order of median family income) on the horizontal axis and the accumulated total lottery sales on the vertical axis. A hypothetical Suits Index graphical representation is shown below highlighted the relationship between lottery sales and family income. The resulting curve from the plotted income and tax presents a curve resembling the Lorenz curve. The area between the Lorenz curve and the line of tax

Figure 4. Calculating the Suits Index
proportionality is divided by the area under the line of tax proportionality (Anderson et al., 2003). This relationship is shown graphically in Figure 4. The red line represents the Lorenz curve while the blue line depicts the line of tax proportionality. For the purposes of calculating the Suits Index the area below the Lorenz curve is divided by the area under the line of tax proportionality. Anderson et al. (2003) described the derivation of the Suits Index where

\[ S = 1 - \frac{L}{K}. \]

For a proportional tax, \( L \) approaches \( K \), so the Suits Index \( S \) approaches zero. Since the Lorenz Curve corresponding to a progressive tax sags below the line of proportionality, the area \( L \) is smaller than \( K \). As a result, the index \( S \) is positive for a progressive tax. In the limiting case where the highest income household bears the entire tax burden... \( L \) equals zero and hence \( S = 1 \). With a regressive tax, the Lorenz curve arches above the line of proportionality making the area \( L \) larger than \( K \), so \( S \) is negative. An index of minus one indicates that a tax system is completely regressive with the lowest income household paying all of the tax. An index value of zero identifies a tax system as proportional. (p. 83)

Throughout consideration of the Suits Index “S” denotes Suits Index value.

In addition to calculating Suits Index values, double-log regression equations were employed to create elasticity coefficients (from Price & Novak, 1999). Categorizes the games will adjust for the differences between the lottery games offered in Ohio during the years of the present study and the lottery games made available by the Texas
Lottery Commission for 1994 sales data (p. 743). The adjustment involves conflating similar games into one variable for the purposes of calculating an elasticity coefficient which presents a comparison to values generated in Price and Novak (1999). The double-log regression equations are shown below:

\[
\text{lotto} = f (pcy, mage, black, other, mf, bach, nolot)
\]

\[
\text{pick} = f (pcy, mage, black, other, mf, bach, nopick)
\]

\[
\text{inst} = f (pcy, mage, black, other, mf, bach, noinst)
\]

Conflation of games suggests that games that offered a similar format of the Lotto games (low odds of success / highest payout), Pick games (Pick 3 and Pick 4), and Instant games were conflated with those respective games. Ohio lottery product offerings have changed over time. Games that are similar in format were included in the same variable for consideration in the double-log regression equation. For example, Pick 3 games and Pick 4 games offer a similar format and are included together in the \textit{pick} double-log regression equation. The other equations (\textit{lotto} and \textit{inst}) followed the same format for their respective games. This strategy offered a method to compare games that evolves over time in Ohio (which will be noted in Chapter 4 subsequent to data collection and analysis) which can be compared to the benchmark work of Price and Novak (1999). Since the lottery adds games over time and removes others from its product offerings, by maintaining three categories of games, comparison over time is facilitated not only within the Ohio lottery, but with the findings in Price and Novak (1999) and other lottery scholarship.

Variable definitions then follow as suggested by Price and Novak (1999).
Table 3.

*Variables Used in Double-Log Regression*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>lotto</td>
<td>per capita expenditure on lottery games</td>
</tr>
<tr>
<td>pick3</td>
<td>per capita expenditure on Pick 3 games (including Pick 4)</td>
</tr>
<tr>
<td>inst</td>
<td>per capita expenditure on instant games</td>
</tr>
<tr>
<td>pcy</td>
<td>aggregate family income</td>
</tr>
<tr>
<td>mage</td>
<td>median age</td>
</tr>
<tr>
<td>black</td>
<td>percentage of the population that is African American</td>
</tr>
<tr>
<td>other</td>
<td>percentage of the population that is neither African American nor Caucasian</td>
</tr>
<tr>
<td>mf</td>
<td>ratio of male to female population</td>
</tr>
<tr>
<td>bach</td>
<td>percentage of college graduates</td>
</tr>
<tr>
<td>nolot</td>
<td>per capita expenditures on games other than the lottery</td>
</tr>
<tr>
<td>nopick</td>
<td>per capita expenditures on games other than Pick 3 games</td>
</tr>
<tr>
<td>noinst</td>
<td>per capita expenditures on games other than instant games</td>
</tr>
</tbody>
</table>

All of the variable descriptions are drawn from Price and Novak (1999, pp. 744-745). It should also be noted that since the income elasticity coefficients are desired to calculate tax incidence, “[a]ll variables are expressed in logarithms” (p. 745).

**Tax Incidence: Analysis**

Analysis of Suits Index results involved placing the calculated value along the tax incidence continuum of possible values for designation as a regressive, proportional, or progressive tax. If the point estimate value returned is positive, then the tax is progressive. If the value is zero, then the tax is proportional. If the value is negative, then the tax is regressive. With applied confidence intervals, this analysis was placed on the upper and lower ends of the confidence interval. Confidence intervals were calculated at
the 99% confidence level. This is the high threshold exhibited in lottery literature (Combs et. al., 2008). If both extremes of the confidence interval were positive then the tax was progressive. If both ends of the confidence intervals were negative then the tax was regressive. If, however, the tax crosses zero, then the results indicate that multiple tax incidences are possible. In that case the ambiguous result leads to a determination that no conclusive claims can be made about the tax incidence of that specific income and lottery sales data set. Price and Novak (1999) offered historical values of the Suits Index. These values reveal a range of 0.11 for personal income taxes in 1984 (Metcalf, 1994) at the progressive end of the tax incidence continuum to -.48 for Maryland three digit numbers games (Clotfelter and Cook, 1987). No lottery scholarship known at the time of this study suggests values outside of this range for tax incidence analysis.

Price and Novak (1999) offered a valuable contemporary and comprehensive standard for double-log regression analysis. Elasticity coefficients for income that were less than one and were statistically significant within the designated threshold indicate an elasticity coefficient that reflected a regressive tax incidence. Income elasticity coefficients that were greater than one pointed to a progressive tax. No claims are made involving variable relationships when the elasticity coefficient was outside of the statistically significant level for the analysis.\(^\text{15}\)

While the income coefficient represented how the dependent variable (the specific lottery game, whether Lotto, Pick, or Instant) responded to a change in the income variable, the other demographic variables represented how a change in the specific variable represented a change in the lottery games’ sales. A positive coefficient indicated

\(^{15}\) Statistical significance is considered at .01 and at .05 levels.
that as the incidence of the specific variable increased, a corresponding increase in the
dependent variable was found. A negative coefficient suggested that as the demographic
variable of interest rose, the sales of the specific type of lottery game fell. The size of the
coefficient represented the magnitude of that change. A coefficient of 1.0 suggested that
the increase in the demographic variable pointed to a commensurate increase in the
dependent variable (lottery game sales).

**Qualitative Dimensions of Lottery Participation: Research Design**

The purpose of the qualitative component of this study is to investigate the
experiences, understandings, and perspectives of lottery participants in the context of the
lottery as a funding mechanism designed to benefit public education. The second research
question lends itself to a qualitative research design. The purpose of the investigation of
the lottery from a qualitative perspective is to present a wholly different facet of school
finance research otherwise absent from tax incidence literature.

In considering the research design of the approach to the second question,
Maxwell (2005) illuminated intellectual and practical goals to which a qualitative
research design can add to this study. He unveiled that “[u]nderstanding the meaning, for
the participants in the study, of the events, situations, experiences, and actions they are
involved with or engage in” is the primary goal of the research design (Maxwell, 2005, p.
22). This understanding takes place within a “particular context within which participants
act, and the influence that this context has on their actions” is revealed by the design of
the inquiry (p. 22). Understanding the “process… and [d]eveloping causal explanations”
can be an important product of the endeavor to reveal the perceptions of participants (p.
23). Since the second research question examines perceptions and dispositions rather than categorical demographic classifications, the second research question relies on the qualitative interview to collect data.

**Qualitative Data Collection**

Qualitative interviews were the primary mode through which the otherwise hidden perspectives of lottery players were revealed in this study. Weiss has suggested (1994) that through interviewing… [we can learn] about people’s interior experiences. We can learn what people perceived and how they interpreted their feelings. We can learn the meanings to them of their relationships, their families, their work, and their selves. We can learn about all the experiences, from joy through grief, that together constitute the human condition. (p. 1)

Patton (2002) has suggested that

[the purpose of interviewing, then, is to allow us to enter into the other person’s perspective. Qualitative interviewing begins with the assumption that the perspective of others is meaningful, knowable, and able to be made explicit. We interview to find out what is in and on someone else’s mind, to gather their stories. (p. 341)

The interview therefore was the primary method of collecting data to inform the second research question.

With a wide variety of interview formats for selection, the unstructured interview or open-ended interview as defined by Patton (2002, p. 342) was selected because of the
propensity of this format of interviewing to present “opportunities for flexibility, spontaneity, and responsiveness to individual differences and situational changes” (p. 343). While Patton (2002) envisioned the unstructured interview and the interviewer’s reliance on an interview guide as distinctly separate facets of interviewing, it needs to be clearly stated that the interview guide was only an aid to guide the interview and not, as Patton (2002) argued, a “systematic” format for the conversational interview. Pilot study work investigating this question has been explored generating the interview schedule as attached in Appendix A that served as the guide for the conversational interview. The interview schedule included questions about the respondents’ background, their lottery purchasing behavior, how they understand lottery revenue distributions (including any understood connections to education), and general lottery perceptions (fairness and state involvement of lottery). All questions have been framed to consider Patton’s (2002) interview question typology which included “experience and behavior questions… opinion and values questions… feeling questions… knowledge questions… sensory questions… and background / demographic questions” (as cited in Merriam, 2009, p. 96).

**Qualitative Participant Sampling**

Selecting the participants for the qualitative component of this study proceeded from a snowball sampling strategy. As described in greater detail in Chapter 4, the retail location that served as the social and geographic center of the qualitative research in this study was accessed from prior pilot study research in the field of lottery tax incidence. After obtaining access to the employees through the owners and the management of the
retail location, the gatekeeper was identified. The respondent that acted as the gatekeeper for all interviews had the authority from the management of the retail store to approve individual interviews. As Patton (2002, p. 237) suggested, snowball sampling involves working with the gatekeeper (initial participant) to determine who can best inform the research focus.

Lottery scholarship overwhelmingly supports the claim that lottery participants represent lower income levels and those with less educational achievement than non-lottery participants. Lottery participants offered the opportunity to participate in the study were sampled from a lottery retail provider in a zip code area representing lower income and less educated consumers. The location was selected for three reasons. First, the location sells lottery products and, secondly, the store is located in a zip code that reflects lower median income and education demographics. Thirdly, the location offers an opportunity to first observe participation in the purchase of a lottery ticket and then solicit participation in the study. Adams (2001) provided a rough framework for the solicitation of interview participants as he requested participation from individuals that met a specific sampling requirement. For the purpose of this study my sampling requirement was that the respondents play the lottery and purchase tickets from a retail vendor within a zip code that reflects median income from the lower end of the income spectrum.

Participants were recruited at the site of a retail location where the participants purchased a lottery ticket. All interviews were recorded by electronic device. Interview data were then transcribed to facilitate data analysis. Participants’ identities were kept confidential and the interview data were stored electronically in an encrypted format. All
respondents completed the consent form that explains the general purpose of the research (Appendix B). Five retail lottery employees and lottery participants volunteered to participate in the interviews. Four of the respondents were female and one respondent was male.

**Qualitative Data Analysis**

Analysis of qualitative interview data in this study proceeded from an adapted grounded theory framework (Strauss & Corbin, 1998). The analysis was engaged to “generate initial categories… and to discover the relationship among concepts” (1998, p. 57). Patton (2002, p. 133) suggested (in the context of an interpretive framework) that this framework can help illuminate the question of “[h]ow can this narrative be interpreted to understand and illuminate the life and culture that created it?” In describing the context of analysis they suggested over-arching principles of analysis that deserve further attention here as they are applied to the interview data. They are adapted for the purposes of this study. They suggested that the analysis is a “very focused” process which “forces researchers to consider the range of plausibility, to avoid taking one stand or stance toward the data… The data are not being forced; they are being allowed to speak” (Strauss & Corbin, 1998, p. 65). This necessarily compelled my analysis to focus on “listen[ing] closely to what the interviewees [said] and how they [said] it” (Strauss & Corbin, 1998, p. 65). Important for analysis was the recognition that the demographic “specifics” of the respondent were not the focus of the interview (as a causal factor determining lottery play), but rather “it is the data that are relevant” (Strauss & Corbin, 1998, p. 66). In conducting the actual process of analysis I “conceptualize[d] and
classif[ied] events, acts, and outcomes. The categories that emerge[d], along with their relationships, [we]re the foundations for [my] developing theory” (Strauss & Corbin, 1998, p. 66). The classification then of interview data allowed for a “grouping [of] concepts according to their salient properties, that is, for similarities and differences” (Strauss & Corbin, 1998, p. 66). It is important to note for the application of this framework for analysis to this study that the process was “flexible and creative” in order to “develop truly innovative but grounded theory” (Strauss & Corbin, 1998, p. 71).

**Researcher as Instrument of Data Collection, Analysis, and Interpretation**

It is important to disclose within the context of qualitative data collection, analysis, and interpretation the various biases that could impact the qualitative research process. This disclosure is intended to build the credibility and trustworthiness of the process and product of the present research study, specifically the qualitative component. As a researcher my biases are formed by my role as an educator in the same geographic area where the interviews were conducted. Although none of the participants were directly connected by a family relationship to any of my students past or present, my role as an educator played a part in the interviews. In addition to my role as an educator, I was also predisposed to identify with Appalachian culture. My students represent a predominantly Appalachian heritage that is shared by all of the respondents. No claims of objectivity are made, but rather subjectivity is part of the data collection, analysis, and interpretation process. Patton suggested, in an effort to address biases and subjectivity that, “… good, solid description and analysis – not your own personal perspective or
voice, though you acknowledge that some subjectivity and judgment may enter in” (2002, p. 93).

**Qualitative Internal and External Validity**

The sampling strategy selected for the qualitative facet of this study – purposeful sampling – was not intended to be a representative sample of the population of Ohio lottery participants or policy makers, therefore no generalizability claims (external validity) are extended (Merriam, 2009). However, as Merriam suggested, “[a]lthough generalizability in the statistical sense… cannot occur in qualitative research, that’s not to say that nothing can be learned from a qualitative study” (2009, p. 224). She continued by theorizing

> the notion of *transferability* [emphasis in original], in which ‘the burden of proof lies less with the original investigator than with the person seeking to make an application elsewhere. The original inquirer cannot know the sites to which transferability might be sought, but the appliers can and do…

Merriam, 2009, pp. 224-225, as cited in Lincoln & Guba, 1985, p. 298

The final caution offered by Merriam is “to provide ‘sufficient descriptive data’ to make transferability possible (Merriam, 2009, pp. 224-225, as cited in Lincoln & Guba, 1985, p. 298).

To strengthen the internal validity of this study, Merriam (2009) promoted a number of valuable strategies that were employed in this study. Triangulation of data sources was used to collect interview data “from people with [potentially] different perspectives…” (p. 216). Respondents reflected stakeholders that could potentially offer
divergent understandings of the lottery process as a means to finance public schools. In addition to triangulation of data sources, member checks were also used “to solicit feedback on [my] emergent findings from …; the people that [I] interviewed” (p. 217). Respondents were encouraged to clarify where necessary the meaning that they construct concerning lottery participation. The third strategy suggested by Merriam (2009) employed in the qualitative facet of this study is “[a]dequate engagement in data collection” which set as a goal for data collection that as interviews continue, “the data and the emerging findings must feel saturated; that is, [I] begin to… hear the same things over and over again, and no new information surfaces as [I] collect more data” (p. 219).

With a framework for quantitative and qualitative data collection, analysis, and interpretation, the findings of this study are presented.
Chapter Four: Findings

This chapter presents the findings based on a quantitative analysis of the tax incidence of the Ohio lottery and a qualitative consideration of the perceptions of Ohio lottery participants. The quantitative component of this study considered the tax incidence from two distinct frames of reference – Suits Index analysis with corresponding confidence intervals and double-log regression analysis. Suits Index analysis provided a perspective of tax incidence based exclusively on lottery sales and income characteristics (aggregate family income) of Ohio zip codes (as suggested in Suits, 1977a). Double-log regression analysis also considered tax incidence in addition to other demographic characteristics (as suggested in Price and Novak, 1999). The qualitative component of this study presents a case study analysis of a single “bounded system” (Merriam, 2009, p. 40) which emerged from the collection of qualitative interviews of lottery participants.

All three facets of the data collection and analysis forward the investigation of the following research questions:

(1) In consideration of Ohio lottery sales as an implicit tax within the framework of the Suits Index for Tax Progressivity (hereafter referred to as the Suits Index), what is the tax incidence of the Ohio lottery for the years 1992 through 2010? How is this tax burden distributed among various demographic groups?

(2) What are the perceptions and understandings of Ohio’s public education stakeholders regarding the Ohio lottery and its role as a mechanism to fund public education in Ohio?
Within the context of the literature and the findings of this study the following assertions are presented:

(1) The Ohio lottery as a whole has been a regressive means for collecting funds for Ohio schools for all of the years covered in this study (1992-2010) as measured by the Suits Index.

(2) The least regressive games as measured by the Suits Index have been the lottery games that offer the largest payout with the lowest odds of winning.

(3) The most regressive games as measured by the Suits Index have been the lottery games that offer lower prize payout values with higher odds of participants owning a winning games ticket.

(4) Double-log regression analysis shows Lotto games, Instant games, and Pick games to be regressive to varying degrees for each year of the study. Instant games were found to be the most regressive games while Pick games were less regressive with Lotto games being the least regressive games.

(5) Age impacts lottery sales. Double-log regression analysis reveals that older lottery consumers drive increased sales of all three type of lottery games with the greatest magnitude of impact being found for Lotto games while the most statistically significant results revealing a positive connection between older lottery consumers and sales was found for Instant games.

(6) Race has a significant impact on lottery purchases. Contrary to much of the existing literature in lottery scholarship, increased populations of African Americans in Ohio do not drive increases in lottery games sales according to
the double-log regression analysis completed in this study. Increases in percentages of Non-African American minorities in Ohio were found to have a positive relationship to increased Lotto sales in most of the years studied. (7) Gender (increased percentages of males in a zip code) was shown to lead to increased Instant games sales and there is some evidence in a few of the years that the same phenomenon occurs in Lotto games. No connection between gender and Pick games was found through double-log regression analysis. (8) When regressing levels of education against lottery sales the results suggest that higher educated lottery consumers drove increases in Lotto games and Pick games sales. This finding is not mirrored in most of the existing lottery scholarship. (9) Double-log regression analysis suggests that purchases of lottery products are found to drive the additional purchase of other lottery products. This complimentary relationship is most significant with Lotto games and Pick games. (10) Respondents strongly voiced a perspective that regardless of individual consequences, lottery players should be allowed to participate in lottery games as they choose. (11) Respondents revealed that they feel a strong ability to control the lottery process when they are able to select the numbers they play or the tickets they purchase based on social constructed or situationally applicable rules and values.
Respondents indicated that they are aware that lottery profits are intended to benefit schools. In conjunction with this awareness was a strong anti-lottery and anti-large school district sentiment.

The organization of Chapter Four begins with a description of the findings of Suits Index analysis for the years 1992-2010 including a between-games description of the differences between the games for the same years. Suits Index values are considered against nearly four decades of lottery scholarship. Suits Index analysis is followed by a description of the double-log regression analysis findings which include a consideration of the impact of family income, age, race, gender, and education on lottery sales in the state of Ohio for the years 1992-2010. The chapter concludes with a case study presentation of lottery participants’ perspectives and understandings of lottery activity as it intersects with the role of the Ohio lottery as a funding mechanism for Ohio’s public schools.

**Suits Index Analysis of Ohio Lottery Sales and Family Income**

Table 4 describes the longitudinal tax incidence evolution of the Pick 3, the Pick 4, the Rolling Cash 5 (previously the Buckeye 5), and the Kicker (which is no longer offered by the Ohio lottery being replaced in 2011 by the Megaplier). The Ohio lottery describes both the Pick 3 and the Pick 4 games as “draw games” where participants select three or four numbers (as suggested by the Pick 3 and Pick 4 names) that can be matched in a variety of ways to provide a payout of $250 on a straight match for a fifty cent Pick 3

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16 Between games data is presented in Appendix C.
17 A more complete description of all of the Ohio lottery product offerings is available in their annual report (Ohio Lottery Office of Finance, 2011, pp. 6-7).
wager to $17,400 for a 6-way box match on a $6 Pick 4 wager. Participants have the opportunity to play twice a day each day of the week. Odds of winning the games range from 1 in 100 for a split pair Pick 3 match to 1 in 10,000 for a 6-way box back-up bet with straight winners. The Rolling Cash 5 is also considered a draw game by the Ohio lottery requiring a match of five numbers for a jackpot win. Prizes are also awarded for matching 2, 3, or 4 numbers. Odds range from 1 in 10 matching two numbers to 1 in 575,757 to win the jackpot. The maximum amount possible to win for the Rolling Cash 5 game is $1,000,000. Drawings are held once a day, each day of the week. The Kicker (which in 2011 was replaced by the Multiplier) was an opportunity to extend the winning chances of Mega Millions drawings.

The most recent lottery sales data in 2011 suggest that the Pick 3 and Pick 4 games account for nearly a quarter (22%) of all lottery sales with a total of $573.4 million in sales (Ohio Lottery Office of Finance, 2011, p. 7). Over the course of the time period under consideration in this study, the Pick 3 and Pick 4 games beginning in 1992 reveal a significantly different tax burden on lottery consumers. In 1992 the Suits Index values for the Pick 3 game is -.505 while the Pick 4 game is -.429. Suits Index analysis also reveals that the difference rises to a statistically significant level of at least a 99% confidence level when applying the work of Anderson et al. (2003). Despite starting at significantly different values in 1992, by 2004 those differences had disappeared leaving the two games essentially leveling the same tax burden on lottery consumers. By 2010 the Suits Index value for the Pick 3 game had fallen to -.426 while the regressivity of the

18 The Ohio lottery references all of the odds and payouts for games from its Website www.ohiolottery.com/Games. From the games portal each individual game can be located to determine odds and payouts.
Table 4.


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<th></th>
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<th></th>
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<td>2010</td>
<td>-0.426</td>
<td>-0.354</td>
<td>-0.492</td>
<td>-0.436</td>
<td>-0.343</td>
<td>-0.514</td>
<td>-0.174</td>
<td>-0.138</td>
<td>-0.215</td>
<td>-0.205</td>
<td>-0.162</td>
<td>-0.253</td>
<td></td>
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</tr>
</tbody>
</table>

* 99% Confidence Interval
Pick 4 game had increased to -.436. This slight difference in Suits Index values is not statistically significant. In addition, Clotfelter (1979) suggested that daily pick games (Suits Index value of -0.41) were more regressive than the lottery which was also found in this study.

While it is difficult to discern the cause of the opposite movement in regressivity of each game, it is possible that the introduction of more lottery products beginning in 2005 and 2006 could account for this difference. Regardless of the position of the Pick 3 and Pick 4 games when considered against each other, throughout the time frame considered in this study, both of the games remained the most regressive lottery products. When the Suits Index value is placed in the context of other existing lottery scholarship, the Ohio lottery Pick 3 and Pick 4 games comport with Suits (1977b) when he suggested the Suits Index for “illegal lottery operations” of numbers games (p. 27). Suits reported a Suits Index value of -.44 for illegal numbers games. This was the most regressive result in Suits’ study as it was in the present study. When compared to the Texas lottery games the Ohio lottery Pick 3 and Pick 4 games are more regressive. Price and Novak (1999) reported a Suits Index value of -.32 through -.34 for the Pick 3 games depending on the income measure employed. The Ohio lottery Pick 3 and Pick 4 are also more regressive than the Instant games (at -.36 through -.38) which were the most regressive Texas lottery games. Similar to Price and Novak, Combs et al. (2008) suggested that the Minnesota Pick 3 at -.20 and the Pick 5 at -.19 are less regressive than the Ohio lottery Pick 3 and Pick 4 games. Also similar to Price and Novak (1999), Combs et al. (2008) reported that the Pick 3 and Pick 5 games in Minnesota are less regressive than the Instant scratch off
games. Clotfelter (1987) reported the Maryland 3-digit at a -. 42 Suits Index value which compares similarly to the Ohio lottery Pick 3 and Pick 4 games.

Comparison with the Buckeye 5 / Rolling Cash 5 (B5 / RC5) games and the Kicker game is difficult because of the unique nature of each game and a lack of specific scholarship concerning those two games in lottery literature. Over the time period 1992 through 2010 the B5 / RC5 and the Kicker games became less regressive. In comparison to other Ohio lottery games both the B5 / RC5 and the Kicker have typically fallen in the area between the more regressive Instant and Pick 3 and Pick 4 games and the less regressive higher stakes lottery games. RC5 game sales represent less than 3% of total lottery sales (Ohio Lottery Office of Finance, 2011, p. 7).

Table 5 describes the Super Lotto, Instant Tickets, Mega Millions, and Lot-O-Play games. The Super Lotto is a traditional high stakes lottery product where players select six numbers to match out of 44 (later 47 for Super Lotto Plus). Data provided by the Ohio lottery for the Super Lotto concluded in 2004. The Lot O’ Play replaced the Super Lotto offering a slightly different format. The Lot O’ Play (which was only offered for three years; 2005 – 2007) required the successful selection of five out of a possible 100 numbers. Instant games involve the purchase of a scratch-off ticket where the lottery consumer removes the front of the instant ticket to reveal whether the matching criteria has been met to make the instant ticket a winner. These tickets provide immediate results in the lottery gaming experience. Two levels of ticket prices and prizes range from $1 to $20.
Table 5.

$1992 - 2010$ Ohio Lottery Tax Incidence - Suits Index with Confidence Intervals (Super Lotto, Instant Tickets, Mega Millions, and Lot 'O Play)

<table>
<thead>
<tr>
<th>Year</th>
<th>Super Lotto upper</th>
<th>Super Lotto lower</th>
<th>Instant Tickets upper</th>
<th>Instant Tickets lower</th>
<th>Mega Millions upper</th>
<th>Mega Millions lower</th>
<th>Lot 'O Play upper</th>
<th>Lot 'O Play lower</th>
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<td>-0.317</td>
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</tr>
<tr>
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<td>-0.158</td>
<td>-0.233</td>
<td>-0.312</td>
<td>-0.268</td>
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<tr>
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<td>-0.155</td>
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<td>-0.308</td>
<td>-0.263</td>
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<tr>
<td>1995</td>
<td>-0.189</td>
<td>-0.158</td>
<td>-0.221</td>
<td>-0.306</td>
<td>-0.264</td>
<td>-0.348</td>
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<tr>
<td>1996</td>
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<td>-0.149</td>
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<td>-0.301</td>
<td>-0.262</td>
<td>-0.340</td>
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</tr>
<tr>
<td>1997</td>
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<td>-0.302</td>
<td>-0.264</td>
<td>-0.345</td>
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</tr>
<tr>
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<td>-0.148</td>
<td>-0.231</td>
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<td>-0.261</td>
<td>-0.342</td>
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<tr>
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<td>-0.295</td>
<td>-0.258</td>
<td>-0.332</td>
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<tr>
<td>2000</td>
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<td>-0.142</td>
<td>-0.216</td>
<td>-0.292</td>
<td>-0.252</td>
<td>-0.337</td>
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<tr>
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<td>-0.284</td>
<td>-0.244</td>
<td>-0.323</td>
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</tr>
<tr>
<td>2002</td>
<td>-0.169</td>
<td>-0.134</td>
<td>-0.207</td>
<td>-0.283</td>
<td>-0.244</td>
<td>-0.322</td>
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<tr>
<td>2003</td>
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<td>-0.276</td>
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<td>-0.318</td>
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<tr>
<td>2004</td>
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<td>-0.199</td>
<td>-0.267</td>
<td>-0.230</td>
<td>-0.306</td>
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<tr>
<td>2005</td>
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<td>-0.110</td>
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<td>0.193</td>
<td>-0.277</td>
<td>-0.124</td>
<td>-0.088</td>
<td>-0.158</td>
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<td></td>
</tr>
<tr>
<td>2008</td>
<td>-0.238</td>
<td>-0.195</td>
<td>-0.284</td>
<td>-0.126</td>
<td>-0.095</td>
<td>-0.163</td>
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<td></td>
</tr>
<tr>
<td>2009</td>
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<td>-0.276</td>
<td>-0.119</td>
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<td></td>
</tr>
<tr>
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<td>-0.114</td>
<td>-0.079</td>
<td>-0.154</td>
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</tr>
</tbody>
</table>

* 99% Confidence Interval
From 1992 through 2004 the tax incidence for the Super Lotto fell slightly and consistently. The calculated Suits Index values range from -.200 in 1992 to -.155 in 2004 for the Super Lotto. These results are consistent with the Pennsylvania lotto game reported by Suits (1997b). The Super Lotto results are slightly more regressive than the Hot Lotto point estimate results presented by Combs et al. (2008). In comparison to the work of Price and Novak (1999), the Super Lotto in Ohio (1992) reflects nearly an identical Suits Index value in Texas (-.20 through -.21) regardless of the income unit of analysis. The Mega Millions game reflects a slightly more progressive tax incidence from 2002 through 2010 (-.188 in 2002 through -.113 in 2010). Mega Millions sales account for slightly over 6% of total lottery sales (Ohio Lottery Office of Finance, 2011, p. 7). While the lottery style games in Ohio are less regressive than reported in Clotfelter (1979), the comparison that those games are the least regressive is also found in Clotfelter (1979).

The evaluation of the Instant games from the Ohio lottery suggests a similar pattern as was found in previously considered Ohio lottery games. The Instant tickets initially were more regressive in 1992 (-.317) becoming more progressive through 2010 (-.219). The earlier years (covered in the present study) of the Instant games are comparable to Texas results (Price and Novak, 1999) while the later results are more commensurate with values from Minnesota (Combs et al., 2008). While Combs et al. (2008) only reflected a single year of analysis (2004) the confidence interval reported in Minnesota (-.23 through -.34) seems to be very closely aligned with the Suits Index range over the life of the Instant games measured in Ohio (-.219 through -.317). Due to the
absence of any lottery scholarship considering a game similar to Lot O’ Play it is difficult to compare this game outside of the context of the Ohio lottery. In a general sense, Lot ‘O Play seems to fit within the results of other high stakes, low odds games in its tax incidence values which range from -.176 in 2005 to -.130 in 2007. The game was only offered for three years by the Ohio lottery. Instant games sales comprise over half (56.2%) of lottery sales (Ohio Lottery Office of Finance, 2011, p. 8). Hansen (1995) also reported regressive findings for instant games.

Table 6 and Table 7 describe the most recent product offerings of the Ohio lottery. These games account for 12.7% of lottery product sales in 2010 (Ohio Lottery Office of Finance, 2011, pp. 7-8). Two games of importance deserve mention despite their relative financial insignificance in the context of the total sales garnered by the larger revenue games. These games are the Keno (6.1% of total sales) and Powerball games (2.9% of total sales). In the first year of play for Powerball the Suits Index value was within the confidence interval values of all large jackpot / low odds games offered by the Ohio lottery. Also of note are the Keno games. These games reflected the lowest Suits Index value of any of the Ohio lottery games studied from 1992 through 2010. Through 2008 to 2010 the Keno tax incidence has become more progressive. In 2010 the upper value of the Keno tax incidence confidence interval approached zero. If the confidence interval crosses zero, the game then can no longer be determined to be a regressive tax.

After completing an analysis of individual game tax incidence, a consideration of the tax incidence of Ohio lottery total revenues is presented. This analysis allows a more comprehensive placement of the Ohio lottery’s tax incidence within the larger context of
Table 6.

*1992 - 2010 Ohio Lottery Tax Incidence - Suits Index with Confidence Intervals (Raffle, Ten-Oh, Classic Lotto, and EZ total)*

<table>
<thead>
<tr>
<th>Year</th>
<th>Raffle upper</th>
<th>Raffle lower</th>
<th>Ten-Oh upper</th>
<th>Ten-Oh lower</th>
<th>Classic Lotto upper</th>
<th>Classic Lotto lower</th>
<th>EZ total upper</th>
<th>EZ total lower</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>-0.151</td>
<td>-0.119</td>
<td>-0.188</td>
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</tr>
<tr>
<td>1993</td>
<td>-0.135</td>
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<tr>
<td>1994</td>
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<td>-0.273</td>
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<td>1995</td>
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<td>-0.188</td>
<td>-0.224</td>
<td>-0.174</td>
<td>-0.272</td>
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<td>-0.099</td>
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<tr>
<td>1996</td>
<td>-0.124</td>
<td>-0.082</td>
<td>-0.169</td>
<td>-0.227</td>
<td>-0.176</td>
<td>-0.276</td>
<td>-0.116</td>
<td>-0.084</td>
</tr>
<tr>
<td>1997</td>
<td>-0.114</td>
<td>-0.069</td>
<td>-0.165</td>
<td>-0.218</td>
<td>-0.174</td>
<td>-0.267</td>
<td>-0.115</td>
<td>-0.078</td>
</tr>
<tr>
<td>1998</td>
<td>-0.124</td>
<td>-0.082</td>
<td>-0.169</td>
<td>-0.227</td>
<td>-0.176</td>
<td>-0.276</td>
<td>-0.116</td>
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<tr>
<td>1999</td>
<td>-0.114</td>
<td>-0.069</td>
<td>-0.165</td>
<td>-0.218</td>
<td>-0.174</td>
<td>-0.267</td>
<td>-0.115</td>
<td>-0.078</td>
</tr>
<tr>
<td>2000</td>
<td>-0.114</td>
<td>-0.069</td>
<td>-0.165</td>
<td>-0.218</td>
<td>-0.174</td>
<td>-0.267</td>
<td>-0.115</td>
<td>-0.078</td>
</tr>
<tr>
<td>2001</td>
<td>-0.114</td>
<td>-0.069</td>
<td>-0.165</td>
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<td>-0.174</td>
<td>-0.267</td>
<td>-0.115</td>
<td>-0.078</td>
</tr>
<tr>
<td>2002</td>
<td>-0.114</td>
<td>-0.069</td>
<td>-0.165</td>
<td>-0.218</td>
<td>-0.174</td>
<td>-0.267</td>
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<tr>
<td>2003</td>
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<td>-0.069</td>
<td>-0.165</td>
<td>-0.218</td>
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<td>-0.267</td>
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<td>2004</td>
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<td>2005</td>
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<tr>
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<td>-0.069</td>
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<td>-0.267</td>
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<td>2008</td>
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<td>2010</td>
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<td>-0.267</td>
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</tr>
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</table>

* 99% Confidence Interval
Table 7.

1992 - 2010 Ohio Lottery Tax Incidence - Suits Index with Confidence Intervals (Keno, Keno Boost, Powerball, Total Lottery)

<table>
<thead>
<tr>
<th>Year</th>
<th>Keno upper</th>
<th>Keno lower</th>
<th>Keno Boost upper</th>
<th>Keno Boost lower</th>
<th>Powerball upper</th>
<th>Powerball lower</th>
<th>Total Lottery upper</th>
<th>Total Lottery lower</th>
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<td>-0.374</td>
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<td>-0.009</td>
<td>-0.143</td>
<td>-0.094</td>
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</table>

*99% Confidence Interval*
lottery scholarship. Specifically, Miyazaki et al. (1998) offered the only longitudinal examination of lottery tax incidence offering an important frame of reference for the tax incidence calculated in Ohio in this study.

Chapter 2 provides an important theoretical framework of understanding the historical tax incidence of the lottery (total lottery sales) within the context of a longitudinal study. Miyazaki et al. (1998) suggested that “lotteries in general become less regressive as they mature” (p. 169) which was certainly the case with the Ohio lottery. Understanding this trend is illuminated to a larger degree through an examination of the regression analysis as Miyazaki et al. (1998) suggested when they claimed that “the combination of… various [demographic] factors likely contributes to how state lotteries proceed through their product life cycles…” (p. 164). Beginning in 1992 the Ohio lottery was calculated to have a Suits Index value of -0.330. By 2010 the value had risen to (a more progressive value of) -0.248. Including the confidence intervals, the Ohio lottery varied between -0.201 and -0.374 over the time period of the lottery games included in this study (1992-2010). These results are significantly more regressive than the results reported by Miyazaki et al. (1998) in all six of the states they considered. Miyazaki et al. (1998) suggested values that ranged from +0.007 in 1993 in Oregon to -0.152 in Florida in 1992. One large methodological difference should be noted. Miyazaki et al. (1998) developed their analysis based on county level data while the work in this study is focused on zip code level data. This difference could be significant in the calculation of the Suits Index. County level data would only provide between 36 (Oregon) to 92 (Indiana) data points at the county level while zip code analysis provides nearly 1,000
data points. Early lottery scholarship suggested the methodological importance of zip code analysis (Clotfelter, 1979).

Suits (1977b) positioned existing state lotteries with a Suits Index value of -0.31 which seems to be comparable to the regressivity results of the initial years of this study. Vaillancourt and Grignon (1988) reported a lower value (-0.18) for Canadian lotteries (although Livernois’ (1987) values were slightly less regressive in Canada), while Clotfelter and Cook (1987) suggested a value (-0.36) which falls within the lower extremes of the findings of this study. It is important to note that most of the lottery scholarship since Price and Novak (1999) offered individual game regressivity values, while earlier work reported total lottery regressivity.

Emerging from the Suits Index analysis are three assertions:

(1) The Ohio lottery as a whole has been regressive for all of the years covered in this study (1992-2010) as measured by the Suits Index. This includes both individual lottery games and the Ohio lottery as a whole.

(2) The least regressive games as measured by the Suits Index have been the lottery games that offer the largest payout with the lowest odds of winning.

(3) The most regressive games as measured by the Suits Index have been the lottery games that offer lower prize payout values with higher odds of participants owning a winning games ticket.

With an understanding of the economic context of lottery participants provided by the Suits Index for Tax Progressivity, the results of the double-log regression analysis are
provided to build a more comprehensive understanding of the demographic characteristics of lottery participants.

**Double-Log Regression Analysis of Lottery Sales and Demographic Variables**

The organization of the second section of Chapter 4 begins with a presentation of the double-log regression analysis findings in similar form as found in Price and Novak (1999). Before moving to the results of double-log regression analysis it is informative to consider the Ohio lottery and its games in the context of the product life cycle. This explanation is in the context of Miyazaki et al. (1998) who suggested that the early years of the lottery may be more regressive reflecting the games’ position along the product life cycle. While product life cycle scholarship is largely beyond the purview of this study, understanding potential factors that influence consumer participation in lottery purchases cannot be divorced from understanding elementary theory behind the product life cycle. Miyazaki et al. (1998) considered demographic factors coming together to impact the lottery as it moved through the product life cycle. In the recent decade of lottery research, catalyzed by Miyazaki et al. (1998) and exemplified in the present study, we now can begin to understand how different demographic factors influence lottery participation over time. It is important to emphasize that different studies have historically highlighted aspects of lottery behavior, however, as Miyazaki et al. (1998) cautioned … because it is unclear what factors are driving this effect, further research is needed to clarify the nature of these trends. At the very least, our research demonstrates the need for a shift from single time period research to research that
involves multiple time periods, so that changes in lottery phenomena can be tracked and interpreted appropriately. (p. 169)

An understanding of the lottery product life cycle is intertwined with an understanding of the demographic factors that influence lottery participation.

Day (1981) describes four stages of the product life cycle and their corresponding characteristics that seem to be universally accepted in the field of marketing scholarship. The first stage is the introduction of the new product. In Ohio, the introduction of the lottery in the 1970’s followed this sequence. The benefit of this study is that the product life cycle can be applied to various products in different stages of their maturity. The lottery was still in the growth and maturity phase of the product life cycle when data for this study began to accrue in 1992. Other products, like the Super Lotto, and Lot ‘O Play are seen in the fourth declining stage. Products like the Pick 3 and Pick 4 games are seen throughout this study in the context of the third stage which is reflected by a mature product. This analysis is not meant to imply that the product life cycle is a simple curve that can easily be identified for every product. Rather, understanding the product life cycle can help explain the introduction of new games introduced by the Ohio lottery.

Miyazaki et al. (1998) suggested that lottery products in their early years may be more regressive. With the benefit of the results of this study, we can hold that claim up to the empirical results in Ohio.

Understanding Elasticity Coefficients. This study endeavors to make the results of the double-log regression analysis approachable as school finance issues are considered by policy making stakeholders. For this purpose a few brief explanatory notes
are necessary in order to facilitate both an understanding of the double-log regression results of this study in addition to their importance when considered against other lottery scholarship. The elasticity coefficients described throughout this section of the study indicate how a percentage change increase in the variable of interest is reflected in the increase in the specific games’ sales.

The income variable is denoted as PCY in the double-log regression equations. In understanding the results, the findings should be considered reflecting how a 1% increase in income (aggregate family income) is then followed by a change in specific lottery games’ sales as indicated by the elasticity coefficient. If the elasticity coefficient is 1.000 the result indicates that a 1% change in income is followed by a 1% change in level of lottery sales. In other words, there is no percentage change in income in respect to lottery sales. This indicates a proportional tax. If the elasticity coefficient is greater than 1.000, the findings point to a progressive tax. If a 1% increase in income results in an elasticity coefficient less than one, there is a regressive relationship between income level and lottery sales. Income is growing faster than lottery sales. This is known as a regressive tax incidence. In essence, the coefficient reports how sensitive lottery sales are to increases in income. The analysis for the other lottery games and their respective variables is similar. The elasticity coefficients measure the percentage increase in the independent variable as reflected in the lottery games’ sales.

**Double-Log Regression Analysis Results.** From 1992 through 2010 the Ohio Lottery games have been consistently and decidedly regressive. It should be remembered that in order to facilitate comparison between the results of this study and previous lottery
scholarship, three categories of lottery games are considered in the double-log regression equations. Lotto games include low odds / high payout games, Pick games comprise Pick 3 and Pick 4 games, and Instant games are made up of scratch off games. These three categories are constructed as found in Price and Novak (1999) for individual games in Texas. These categories are most recently employed in Daberkow & Lin (2012) which considered regressivity of the Illinois lottery.

To preface the double-log regression discussion, it is important again to describe the differences between the games. This explanation should add the development of an understanding of how each independent variable impacts a response in the dependent variable. In each of the three double-log regression equations, the dependent variable is either Lotto games, Pick games, or Instant games. Lotto games involve selecting a series of two-digit numbers. The Powerball game, for example, is played by selecting six numbers ranging from one through fifty-nine. All six numbers must be matched in order to win the prize. The odds of successfully matching all six numbers are approximately 1 in 175 million (http://www.ohiolottery.com/Games/DrawGames/Powerball.aspx). All of the Lotto games are similar to the Powerball in their design – low odds / high payout. The games that make up the Pick games are played in Ohio by selecting either three one-digit numbers (Pick 3) or four one-digit numbers (Pick 4). Bets on the Pick games vary from $.50 to $6 on a single ticket with a corresponding payout reflecting the wager (http://www.ohiolottery.com/ Games/DrawGames/Pick-3.aspx). The final category of games represented in a double-log regression equation is the Instant games. Instant games range from $1 to $20 to play. Scratching off the covering of the ticket reveals whether the
appropriate matches categorize the ticket as a winning ticket. While the Instant prizes are significantly smaller than the Lotto prizes, the odds are better for the player of purchasing a winning ticket. The equations as developed in Chapter 3 are shown below:

\[
\text{lotto} = f (\text{pcy}, \text{mage}, \text{black}, \text{other}, \text{mf}, \text{bach}, \text{nolot})
\]

\[
\text{pick} = f (\text{pcy}, \text{mage}, \text{black}, \text{other}, \text{mf}, \text{bach}, \text{nopick})
\]

\[
\text{inst} = f (\text{pcy}, \text{mage}, \text{black}, \text{other}, \text{mf}, \text{bach}, \text{noinst})
\]

A double-log regression analysis (based on the equations above) was conducted which created elasticity coefficients for the explanatory variables in question as described in Chapter 3. Those variables include income (PCY – aggregate family income), age (AGE – median age), BLACK (percentage of the population that is African American), OTHER (percentage of the population that is neither White nor African American), gender (MF – ratio of males to females in the population), BACH (percentage of the population over 25 years old with bachelor’s degree), and OTHER LOTTERY PURCHASES (purchases of all lottery products except the dependent variable). Table 8 and Table 9 detail the double-log regression analysis findings for Lotto games from 1992 through 2010. Table 10 and Table 11 describe the results for Pick games. Table 12 and Table 13 then describe the results for the Instant games.

The most regressive games throughout the years of this study were the Instant games. Only 1995 returned a value that was not statistically significant. All other years produced elasticity coefficients hovering close to zero with very little variability between years. Any statistically significant income elasticity coefficient less than one indicates regressivity. While the magnitude of the regressivity does not compare to that of Price
and Novak (1999), the finding that the Instant games in Ohio, according to double-log regression analysis, are the most regressive games is echoed in the findings from Texas. The least regressive games, the Lotto games, produced values indicating greater progressivity than the elasticity coefficients in Price and Novak (1999) from 1992 through 2000. From 2001 through 2012 the Lotto games appear to become more regressive over time which would seem to contradict the findings of Miyazaki et al. (1998). This study’s findings concur with the assertions of Price and Novak (1999) that the Lotto games are the least regressive lottery products. The Pick games consistently return values that indicate regressivity; however there is no clear pattern over time that emerges. When comparing various types of lottery products, the double-log regression results in this study largely conform to the findings of Price and Novak (1999). The lottery regressivity findings of this study are largely supported through four decades of lottery scholarship. Hansen (1995) also reported lottery regressivity findings with instant games in Colorado. Livernois (1987) suggested a regressive Canadian lottery based on his regression analysis. Heavey (1978) found the Pennsylvania lottery to be regressive using regression analysis as well. Clotfelter (1979) found both daily pick games and lottery games in Maryland to be regressive through regression analysis. This also fits within the findings of Spiro (1974) who found the Pennsylvania lottery to be regressive and Brinner and Clotfelter (1975) in their multi-state study of lottery tax incidence.

Age plays a statistically significant role in all three lottery games. Most glaring is the role that age plays in the sale of Instant games. In each year of the study, except 1999, an increase in the median age in a zip code is associated with an increase in Instant game
sales. This positive relationship suggests that older lottery consumers participate disproportionately in Instant games. For the Pick games, early in the study for the years 1995 and 1997-1999 increases in median age in the zip code results in significantly higher Pick games sales. In the later years of the analysis, median age continues to impact Pick games sales; however these results are only statistically significant in 2008 and 2009. The greatest impact of median age is found in the Lotto games. Age impacts Lotto sales positively with a higher coefficient than is reflected in any of the variables measured in this study. Older lottery participants contribute disproportionately to Lotto games sales. While Price and Novak (1999) reflected mixed results in the context of the impact of age on lottery sales based on game type, this study suggests that median age in a zip code positively impacts lottery sales for all three types of games. Determining what drives the differences in age is difficult to discern. Theorizing that older consumers have more disposable income than younger consumers avoids the realization that income drives lottery sales in addition to age, education, race and gender. Results of this study do not reveal specific breakdowns that show where age (specific age ranges) impacts lottery sales the most. This phenomenon certainly could be included as a focus of future research both from a qualitative and quantitative perspective. As Price and Novak (1999) suggested, referring to the work of Stranahan and Borg (1998), “older lottery participants spend more [on lottery games] than younger participants” (p. 748). The findings in Ohio are in contrast to the work of Heavey (1978) in Pennsylvania who found no statistically significant connection between education and lottery participation. Clotfelter (1987) also
found dissimilar results to the findings in Ohio when he suggested that “… expenditures on lottery products are lowest for the elderly…” (p. 541).

Race has a significant impact on lottery participation in all three categories of lottery games. African American participation in lottery activity is most significant for the Instant games. As the African American population percentage in a zip code increases, Instant sales decrease as is reflected in the negative elasticity coefficient. More research is also needed to more clearly understand minority participation in lottery play. Texas and Ohio are comprised of very different population demographics which may also account for the statistical different.\(^{19}\) This pattern presents itself in stark contrast to the findings of Price and Novak (1999) who suggested that for the Texas lottery, specifically instant games, African American populations drive increased instant game sales. The Lotto games reflect a similar pattern of negative elasticity coefficients which also suggests that as African American populations increase in zip code, Lotto game sales decrease. This finding is similar to Price and Novak (1999) with a very similar coefficient in the most recent half decade of the study. The Pick games do not return consistent statistically significant findings for African American participation. In considering the work of Mikesell (1989), Cook and Clotfelter (1993), and Hansen (1995), Price and Novak (1999) reflected that the Texas lottery games revealed “[p]ositive coefficients relating the percentage of the population that is Black to the purchase of both instant and three-digit numbers games” (p. 747). Price and Novak (1999) also suggested that the findings in Texas “are consistent with most previous findings” (p. 747). The double-log

\(^{19}\) The U.S. Census Bureau reports that while over 80% of Ohio is White, less than 50% of Texas is White (http://census-statistics.findthedata.org/). Other demographic groups have larger representation in Texas which may drive differing elasticity coefficients and regressivity findings.
regression results in this study reveal markedly different participation rates by Ohio’s African American population. Interestingly, Heavey (1978) found no statistically significant connection between race and lottery participation. Clotfelter (1987) found a different pattern of African American involvement in lottery games when he found that as African American populations increased so did lottery sales.

The findings of non-African American minority lottery participation point to less uniform results. Noteworthy are the findings for the Pick games which reveal statistically significant values in all but the most recent two years of the study. The positive elasticity coefficients through 2005 for non-African American minorities in Ohio indicate that as non-African American populations increase in a zip code, Pick sales also increase. Lotto games reflect a similar pattern as Pick games; however, fewer of the years considered in this study returned statistically significant elasticity coefficients. Instant games present a different record of lottery participation for non-African American minorities in Ohio. As the percentage of other minorities increased in a zip code, Instant games sales decreased. While the literature is noticeably scarce considering the role of non-African Americans in lottery sales, Price and Novak (1999) did find that “… Hispanic populations spend greater amounts on the more regressive games…” (p. 747). Ohio’s non-African American minorities spend more on Pick games when considered against their participation in Instant and Lotto games.

Gender plays an important role in determining lottery sales across all games. In each year where double-log regression analysis produced a statistically significant result, increased percentages of males in a zip code suggests that male participation was
positively connected to increased lottery play. Intuitively these findings seem to indicate a willingness to embrace more risk-taking on the part of males. Certainly more research is needed to build an understanding of this pattern of lottery consumer behavior. Instant games showed the most statistically significant results. In each year of this study, increased percentages of males in a zip code positively impacted Instant games sales. Lotto games increased sales were also driven in part by increased percentages of males in a zip code, although not all of the years of the study produced statistically significant results. Pick games only produced two years where the MF variable produced statistically significant results. In those years, 2000 and 2001, increased percentages of males in a zip code were shown to drive the increase of Pick games sales. These findings fit within the results of Price and Novak (1999) with respect to the Texas lottery games. Price and Novak (1999), however, found the Texas Pick 3 sales to be driven by more female lottery participation. The results in this study of Ohio lottery play also confirm the findings of Clotfelter and Cook (1987), which Price and Novak (1999) suggested. Clotfelter and Cook (1987) offered in their review of Maryland lottery activity that “[m]ales spend more than females...” (p. 541).

Both the Lotto games and the Pick games were positively impacted by increased median levels of education in zip codes. The Instant games reflected no consistent pattern of an educational impact on sales. Only in 2005 and 2006 were statistically significant results returned to suggest that increased levels of education are reflected by increases in Instant games sales. These results conflict in part with the findings of Price and Novak (1999) who suggested that higher levels of education tend to drive lower sales of Instant
and Pick games while higher levels of education conversely drives higher levels of lottery play in Texas. Intuitively, as Price and Novak (1999) directed, it would seem that higher levels of education would result in less total lottery activity. Price and Novak (1999) also relied on Clotfelter and Cook (1987 and 1990) and Stranahan and Borg (1998a) in their consideration that higher levels of education result in lower lottery participation levels. Hansen (1995) reported different findings as she offered that increased levels of education positively impacted instant game sales in Colorado. This is significant because Hansen (1995) suggested that “education… was positive and significant when it was the only educational variable included” such as is the case in this study (p. 393). Unlike the findings in Ohio, Heavey’s (1978) consideration of the Pennsylvania lottery revealed no statistically significant connection between education and lottery participation.

The purchase of other lottery products as a driver for different types of games’ sales was also examined in each double-log regression equation. Purchases of other lottery products were positively connected to each games’ sales. In addition, each year of the study produced statistically significant results. These results confirm the work of Price and Novak (1999) in Texas when they suggested that

> [o]ur results clearly indicate that the various lottery games are complementary products. Significant positive relationships between per capita purchases of each lottery game and per capita purchases of the other games appear in all equations. (p. 748)

These finds are mirrored in Ohio but to a significantly larger magnitude.
Emerging from the double-log regression analysis of Ohio lottery sales and demographic variables are the following assertions which build on the assertions that were forwarded based on Suits Index analysis:

(4) Lotto games, Instant games, and Pick games were found to be regressive to varying degrees for each year of the study. Instant games were found to be the most regressive games while Pick games were less regressive. Lotto games were the least regressive games.

(5) Age impacts lottery sales. Older lottery consumers drive increased sales of all three type of lottery games with the greatest magnitude of impact being found for Lotto games while the most statistically significant results reveal a positive connection between older lottery consumer participation and sales for Instant games.

(6) Race has a significant impact on lottery purchases. Contrary to much of the existing literature in lottery scholarship, increased populations of African Americans in Ohio do not drive increases in lottery games sales. Increases in percentages of non-African American minorities in Ohio were found to have a positive relationship to increased Lotto sales in most of the years studied.

(7) Gender (increased percentage of males) was shown to lead to increased Instant games’ sales and there is some evidence in a few of the years that the same phenomenon occurs in Lotto games. No connection between gender and Pick games was found.
(8) The connection between levels of education and lottery sales suggested that higher educated lottery consumers drove increases in Lotto games and Pick games sales. This finding is not mirrored in most of the existing lottery scholarship.

(9) Purchases of lottery products are found to drive the additional purchase of other lottery products. This complementary relationship is most significant with Lotto games and Pick games in Ohio.
Table 8.

*Lotto Games Double-Log Regression Analysis Results*

<table>
<thead>
<tr>
<th></th>
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<td>0.005</td>
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*Italicized* coefficients significant at 0.05 level.

*Bold* coefficients significant at 0.01 level.

Standard errors are immediately below the corresponding elasticity coefficient.
Table 9.

Lotto Games Double-Log Regression Analysis Results

<table>
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<th>Demographic Variable</th>
<th>2001</th>
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**Italicized coefficients** significant at 0.05 level.
**Bold coefficients** significant at 0.01 level.
Standard errors are immediately below the corresponding elasticity coefficient.
Table 10.

*Pick Games Double-Log Regression Analysis Results*

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*Italicized indicates significant at 0.05 level*

*Bold indicates significant at 0.01 level*

*Standard errors are immediately below the corresponding elasticity coefficient.*
Table 11.

*Pick Games Double-Log Regression Analysis*

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*Adjusted R2*  

|          | 0.414 | 0.401 | 0.328 | 0.356 | 0.463 | 0.384 | 0.632 | 0.841 | 0.808 | 0.693 |

*F-statistic*  

|          | 99.550| 94.160| 67.770| 77.420| 120.100| 86.180| 235.500| 721.000| 575.400| 307.000|

*Number of cases*  

|          | 977   | 975   | 960   | 968   | 962   | 959   | 956   | 955   | 958   | 950   |

*Italicized indicates significant at 0.05 level*  
*Bold indicates significant at 0.01 level*  
*Standard errors are immediately below the corresponding elasticity coefficient.*
Table 12.

*Instant Games Double-Log Regression Analysis Results*

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Italicized indicates significant at 0.05 level
Bold indicates significant at 0.01 level
Standard errors are immediately below the corresponding elasticity coefficient.
Table 13.

*Instant Games Double-Log Regression Analysis*

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Adjusted R2 0.981 0.987 0.983 0.984 0.982 0.836 0.905 0.895 0.880 0.798

F-statistic 7207 10530 7700 8720 7576 699 1298 1163 1006 535

Number of cases 977 975 960 968 962 959 956 955 958 950

Italicized indicates significant at 0.05 level
Bold indicates significant at 0.01 level
Standard errors are immediately below the corresponding elasticity coefficient
Qualitative Consideration of Lottery Play

Understanding which economic groups participate in the lottery and how various demographic characteristics impact lottery participation builds to a qualitative analysis of lottery involvement focusing on the perceptions and understandings of lottery participants. The qualitative examination focuses on participants involved in the study being connected within a specific retail establishment that provides lottery products.

Before describing the interview data collected from lottery participants in this study, it is important to describe the specific methodological and theoretical constructions that emerged as the qualitative component of this study unfolded. As detailed in Chapter 3 the sample of respondents was to be constructed purposefully from typical lottery participants. Lottery scholarship has historically detailed the characteristics of lottery participants (Price & Novak, 1999). At the outset of the interviews, however, the participants not only fulfilled these sampling criteria, but also comprised an informative cohort that provided a depth of information rich interview data that would likely not have been available if the respondents were simply “only” lottery players. The evolution of this cohort began after a significant time frame filled with unsuccessful attempts to gather interview data. Most lottery participants approached in this study initially were not willing to discuss their perspectives. These participants were not socially connected to the lottery retail location that became the center of the interviews. Bogdan and Biklen (2007) described this obstacle early in their explanation of the difficulties of gaining access. They suggested a way to gain “low-profile entry” that was useful in this study (p. 86). To gain access to my first interview (and location) I relied on snowball sampling. Patton
(2002) described snowball sampling as “an approach for locating information-rich key informants…” (p. 237). My first respondent for this study was introduced to me by the respondent of an earlier pilot study in lottery participation.

Initially I envisioned the first respondent to be a lottery consumer who would be able to provide her perceptions and understandings of lottery participation. Instead the respondent became the gatekeeper for access to all of the other respondents in this study. My first respondent fulfilled the role of gatekeeper as she authorized and arranged for all of the interviews subsequent to our first conversation. The only criterion that I required was that the respondents she recommended be lottery consumers. The result was a series of interviews with respondents that were connected socially to each other around the physical location of the specific lottery retail establishment. Five respondents agreed to be interviewed and were approved by the gatekeeper to discuss their lottery perspectives with me. All participants were White. Only one of the respondents was not a paid employee of the retail establishment, however, he did execute many quasi-job related functions that have, over time, essentially allowed him to be considered as an “insider.” This emic perspective was reinforced through all of the interviews. Four of the respondents were female and one was male. Many of the interviews overlapped as respondents would move in and out of conversational interviews with each other. These were not group interviews, but rather since interviews were held with all respondents at the same location, respondents present during other interviews would occasionally offer their perspective of the conversational interview. The specific job-related roles maintained included store clerks and shift managers.
The specific names and the location of the establishment are not provided to maintain the anonymity of the participants. It was of great ethical concern to me that the interviews were conducted during a time when retail lottery employees were “on the clock.” The interviews were conducted with the approval of both the manager of the retail location and the owner. If there would have been any hesitation on the part of either stakeholder, I would have endeavored to conduct the interviews outside of the employees’ work schedule. The only caveat to the interview arrangement was that if required by customer traffic, the interview would need to be paused. We also scheduled all interviews early in the day when customer traffic was traditionally very slow. For security reasons, two employees were scheduled to work at all times. For the purposes of this interview, the employment of the respondents allowed the respondents to offer a depth of understanding and experience concerning qualitative aspects of lottery play.

The location of the interviews was a retail establishment that sold lottery tickets. The site for the interviews was selected because of its familiarity to the initial interview respondent. My initial effort was to conduct the interviews in a private break room, but the manager was unwilling, again, because of security issues. The location was on a main thoroughfare through an impoverished area of one of Ohio’s major urban centers. Businesses around the lottery retailer included pawn shops, adult dance clubs, fast food restaurants and other retail establishments. Local crime statistics revealed this part of town to be plagued by crime. From August, 2011 through February, 2012, over 450 incidents of crime ranging from assault to weapons offenses were registered within two miles of the retail establishment that was the center of the interviews. The local Sex
Offender Registry lists 60 offenders residing within two miles of the retail location. The notion of this part of the city as a hub for drugs and crime was offered in the interviews. Two of the closest schools had a student body represented by over 80% economically disadvantaged students.

The physical layout of the building can be described as an “L.” Walking in the front door of the location the customers’ eyes are met with the staples of the location – tobacco, alcohol, and lottery sales. Two separate counters were immediately in front of the store. To the back and right are found less profitable grocery items. There was also a drive through window in the back corner furthest from the front counters. The interviews were conducted at the counter on the left side of the entrance. The right counter was used for lottery purchases. The left side was used for tobacco purchases. Occasionally pay-per-minute cell phone accounts were supported at this counter as well. To avoid having my back completely to the front door of the lottery retailer, I was also turned slightly away from the counter so I could see who was approaching the front door. All of the interviews occurred at this front counter.

All of the interviews, as described in Chapter 3, were based on the interview schedule as attached in Appendix A. The interviews focused on collecting background information, consumer behavior perspectives, understandings of lottery revenue distributions, and general lottery perceptions. The interviews tended to what Patton (2002) described as an “informal conversational interview” (p. 342). Patton (2002) continued by describing the benefit of this type of interview as “… offer[ing] maximum flexibility to pursue information in whatever direction appears to be appropriate,
depending on what emerges… from talking with one or more individuals in that setting. Most of the questions will flow from the immediate context” (p. 342). The goal of the interviews was to gather the perceptions and understandings of lottery consumers in the context of the lottery as a funding mechanism for public schools. The format of the interview was conversational with the interview schedule playing the role of a guide to navigate through the conversation.

**Respondents’ Background.** In an effort to maintain the anonymity of the respondents while still offering valuable description the respondents demographic characteristics are provided. All five of the respondents were Caucasian living within a five mile radius of the lottery retail establishment. Four of the respondents were female and one was male. All five reported have completed at least their GED requirements. Only one respondent indicated attending college although she did not complete the requirements for a degree. Two of the respondents were over sixty years old while three of the respondents were in their late 20’s and early 30’s. Two of the respondents indicated that they were married. All of the respondents indicated that they primarily played Pick 3 and Pick 4 games in addition to Instant games.

One important facet of the respondents that I discovered was their connection both culturally and geographically to an Appalachian heritage. Nearly half of the respondents suggested that they were born in Appalachia while the other respondents implicitly made this connection. Background data was collected during the initial phase of the interview. Two of the respondents provided insightful data detailing the experiences of their families that brought them to urban centers during post-World War II
economic expansion. Obermiller et al. (2000) described this migration in great detail suggesting that “[a]fter World War II the expanding job market caused by the postwar economic boom created a ‘pull’ toward metropolitan areas” (p. xiii).

One respondent described her family’s migration from Kentucky to northern urban centers in the earliest years following World War II. She also portrayed the specific area where she lives as being a destination for Appalachian migration for the past half century. In describing the motivation for the movement of her family she suggested that

… it [the migration] was because of the coal mines shutting down. There was no work for the men that had families. My dad come up here and found a job and come home and got us. Appalachia, if you know anything… there is no jobs. Obermiller et al. (2000) continued by describing that “the collapse of the coal industry and declining employment opportunities in agriculture and timber forced millions of workers out of the mountains in the 1950’s and 1960s” (p. xiii).

She continued by recalling that

… my dad come out of Kentucky in 1950 and went to Michigan and didn’t like that and came here… and got a job and he liked it and stayed with it until he retired.

In connecting her father’s work experiences to the current economic climate in her area of the city she lamented the loss of nearly half a dozen major manufacturers. One of those manufacturers was her first place of employment after completing high school. When this company closed she went to work at a retail store for a short time before settling into her current position.
Another respondent echoed these experiences. Although born in Detroit, his family eventually returned closer to his roots by moving to Ohio. His family settled into the same geographic location where he attended schools that traditionally have been comprised of mostly students with Appalachian heritage (Calestro & Hill, 1976). He commented that he was

… originally from Detroit. I was too young to realize and not rebellious enough to stay up in Michigan. Not that I would stay in Detroit. I hate that town. I do like Battle Creek and places like that.

Obermiller et al. (2000) provided a detailed description of the formation of Urban Appalachian identity, specifically in Detroit. Obermiller et al. (2000) made an important distinction between middle class Detroit residents and urban Appalachian residents. They suggested that even in Detroit, a city that has come to symbolize the problems of the ‘black underclass,’ urban Appalachians are present in the most devastated areas in the city; they too, are disadvantaged by the debilitating effects of inner-city living. The ‘fact’ of their whiteness did not provide them with a privileged inroad to success in the past, nor does their whiteness mitigate their present economic plight (p. 154).

Other respondents did not detail a specific family connection to Kentucky or West Virginia, but did intimate their cultural connection to Appalachian culture in a number of ways including their social connections through work, where they lived, and where they attended school.
All of the respondents reported that they had completed high school. All reported working either at the specific retail location where the interviews were conducted or were in the service related industries. In addition the respondents reported living in blended family arrangements with step-children living in their homes. Each respondent indicated that they played the lottery and provided great detail of their own personal purchasing behavior in addition to their experiences with their customers.

Before moving to a consideration of consumer behavior and their perspectives of the lottery and its connection to education, it is important to note that the cultural frame of reference suggested by the respondents as they provided background information offers important insight into the lens through which lottery experiences can be interpreted. Quantitative data enables a discussion of the differing effects that various demographic characteristics may have on lottery participation. Suits Index analysis suggested the pervasive impact of economic class on lottery participation. Double-log regression analysis pointed to the impact that race has on lottery play in Ohio. Interestingly, African American participation was not shown to drive increased lottery sales (in contrast to existing lottery scholarship; most recently Price and Novak, 1999), however participation by non-African American minorities was shown to positively impact increases in lottery participation. It is within this context that we find the qualitative experiences detailed in this study, that is, the experiences of working-class urban Appalachian lottery players.
Respondents’ Perspective of Lottery Consumer Behavior.

Independence from External Regulation and Control.

The respondents offered valuable and insightful perspectives of lottery consumers’ behavior. Despite the notion presented in some lottery scholarship that the lottery takes advantage of less-educated lottery consumers (Borg & Stranahan, 2005), the respondents revealed a different perspective.

The first theme that emerged from the data in the category of consumer behavior was a commitment by the respondents to the independent nature of the decision making process to engage in lottery play. Whether their perspective was positive or decidedly negative about the lottery in general they all seemed to indicate that lottery consumers should be permitted to decide their own levels of lottery play activity. One respondent strongly declared that

… I don’t think that everyone is financially secure enough to play some of the things that they play but that’s not my business, it’s your money. If you want to spend it, I’m here to take it. That’s an attitude that you have to have. When you see someone come in and play the lottery and won’t feed their children a sucker or something like that it gets to you. You know. By looks, dress, actions. I’ve been with this a long time. When somebody walks in and they count quarters, come on.

The conversation continued as she moved from describing the importance she placed on separating her judgments about lottery consumers to her understanding of how lottery winners should handle their winnings. She suggested that
They [lottery winners] let the money go to their head. They think that when they get all that money it is always gonna be there and it’s not… I think they ought to do an investment. It’s not paying anything now when you get down to it, but it is still there for later. Get it away from you. Spend what you want to spend but don’t overspend… Some people don’t have 30 years. You know if someone is 70 years old and hits that thing. I can buy body parts? No. It don’t work that way. You can leave some things in money to your family and to an estate but you have to have that pacifically [sic] in a will prior to you winning. You know it’s not like, OK it hit three million ok I put that in there. The lottery has a ruling that they are never wrong. You have to do their rules and that is some of their rules. Before you ever… The lottery is an easy way… The lottery is a way of winning money but it is also a way of losing money if you don’t watch what you are doing.

Another respondent added a decidedly more acerbic perspective of lottery consumers and their ability to decide to play. He included his own participation in his comments. He strongly declared that

I have seen them take everything they got. I’ve seen one man lose his whole business with the lottery. I have seen him write checks and checks and checks. I have seen him sell his trucks. He owned trucks for hauling. He lost everything just to get on the Cash Explosion show as a matter of fact. He was sending in 20 or 30 tickets a week entry tickets trying to get on the show. And after losing hundreds of thousands of dollars he wound up winning $7500 on the Cash Explosion show. That’s all he won when he went on.
He continued by suggesting that

The sad part is they say, “play the lottery and you will have fun.” I have seen so many miserable … people playing the lottery it’s not funny because they are so addicted to it and I am probably one of ‘em. It’s really pathetic…. But you know they always say that no one forces you to play and that is very true. We play it out of our own stupidity because the odds are much greater than they try to impress in your mind that they are. It’s rare. Sometimes you hit. If you play sometimes you play heavy numbers you might hit 3, 4, 5 thousand dollars. Then you are on a high. So you go back and spend $15,000 to try to hit again…. What will make you sick … Say you just won $300 … and you stand here and you screw around and you think your luck is running for you and all of the sudden you walk out of the door and think. “Damn I just blew that $300…."

… [But] [y]ou are afraid to get off of them [playing the same numbers].

Even with those comments he would still suggest that consumers be allowed to determine their own levels of lottery play. All of the comments about addiction and the anecdotal stories of abuse were in the context of lottery consumers being allowed to determine their own participation frequency.

In discussing the behavior of consumers that do not purchase winning tickets, one respondent suggested that, “… [m]ost of them know what is going on, they know what they are doing.” She was suggesting that the consumers that do not win understand the unwritten rules of lottery culture which seemed to dictate that losing comes with the
territory. She continued by suggesting that “You never get anyone upset over losing on a ticket. You get maybe ‘I never win!’”

Another respondent built on that perspective which suggested that lottery consumers should be left to determine their own levels of lottery participation when she shared that

I mean they are gonna do with whatever they are gonna do. But everybody is talking about the casino coming in but really it’s the same thing as the lottery. Basically you get addicted to it. You can get addicted to the lottery. It’s the same thing. We have customers that will stand for hours at a time playing instants. So I mean if they are gonna play they are gonna play, that’s the way I look at it. If they got it, they’re going to. If they don’t have to [?] they still do it!

Her rationale was that lottery consumers, despite the additive nature of the games from her perspective, are going to find ways to gamble. Her implicit suggestion corresponded with the other respondents.

Another respondent built on the suggestion of the lottery as addictive when she suggested that

[t]hey [lottery consumers] don’t never quit, they are addicted. I mean it’s an addiction! It’s just as bad as drugs if you ask me. Sometime they spend more money on lottery than they do on [illegal] drugs.

When asked why some consumers seem to get addicted to lottery play while others do not, she suggested that they become addicted “because they have hit it big.” She continued by reasoning that it is “[k]ind of like a slot machine. Once you hear them bells
and whistles going off it’s like… The bigger hits is what sucks them in.” In describing
the specific purchasing behavior of lottery consumers she offered that

[t]hey leave a mess. They just hang out at the front counter and scratch away. We
have a couple of people that picks spots in the store. Got some people that will
buy ‘em and go back out to their car scratch ‘em and then come right back in and
they will do that all day. Just in and out in and out.

All of the respondents seemed to strongly suggest that, despite the addictive
nature of the lottery, lottery consumers should be left alone to make their own purchasing
decisions. None of the respondents suggested that there should be limitations or any type
of restrictions on lottery participation. The theme of independence from regulation is the
first theme the respondents suggested about lottery consumer behavior.

**Personal Connection to the Social Process of Number Selection.** The second
theme that emerged from the interview data of lottery participants was a strong personal
connection to what was clearly a social process of selecting lottery numbers - “lucky
numbers” - in addition to a very clearly defined perspective on their own degree of
fortune in the context of the lottery and life in general. Lottery participants suggested
various mechanisms to increase their luck or fortune in their attempt to secure winning
numbers. In discussing the selection of numbers for the Pick 3 game, one respondent
suggested that the issue of control over the numbers for lottery participants allows players
to impose their “own numbers” rather than a set of numbers that the lottery picks. By
selecting their own numbers to be used for their tickets before the drawing, lottery
participants are not simply hoping to select winning numbers, but rather by selecting
numbers that have some social significance (birthdays, anniversaries, children’s
birthdays, etc.), participants believe that they have control over the process and are able
to turn the drawing in their favor because of that control. Lottery players are then allowed
to play “their numbers.” The ownership of the numbers allows them an advantage in the
lottery winning numbers selection process, from their perspective.

Control as a theme for Pick 3 and Pick 4 games manifests itself as players select
numbers associated to socially significant dates, times, etc. Control of the lottery play
process was also revealed in the way in which lottery players purchased Instant game
tickets. It is important to note that the quantitative analysis suggested that Pick games and
Instant games were the most regressive games. Interview data strongly suggests that
those two types of games offer players the strongest and most pervasive conception of
control.

Interview data revealed an extensive strategy employed when playing Instant
games. The respondents suggested that the rules that are implicitly agreed to by Instant
game players and are regulated by lottery retail employees. One lottery player and retail
employee described the process called “Dirty Hustling.” She explained that

[m]ost of our customers are our regulars and they don’t get like that. They just get
[that] hurt worried look on their face [when they lose]. At the same time after
putting all that money they don’t want to leave and then someone buys one ticket
and gets their money. They look at it like that was my ticket [emphasis in the
interview]. And if you notice on our tickets we have several rolls of each kind.
Because if you have someone coming in and they are buying and buying and they
are playing on that roll you don’t want give the next person off of that roll. Say if you come in and want the same kind of ticket that I have already been standing here playing, I’m going to try to pull it off of the other roll, not the same roll that this person is playing on. … [O]nce someone starts playing on that roll and they haven’t hit nothing and they have put $50, $60 in it, if someone else comes in and wants that same ticket, it’s hard to be like, OK, even though I have seen you lose $70. Especially if they are in here playing. If they walk out the door and they are done, no big deal, buy the ticket. We don’t care. But we try to prevent that. That way that customer has that roll if they want it.

The notion of “Dirty Hustling” comes into play if a customer violates the implicit rules which suggest that a player should not purchase a ticket from a roll another customer has lost on over time. The overarching idea is that the Instant game customer believes that they can increase their odds by controlling which roll is selected to supply their ticket. Other routines that were suggested that indicate an effort to control the lottery process include scratching off tickets with a certain coin or in a specific routinized manner or location.

No comments were offered by respondents in the context of how players endeavor to control high jackpot games like the Powerball game. The only comment that could be construed as a control mechanism for this game is when lottery players select their own numbers, although these numbers do not easily fit into a framework found in the Pick 3 and Pick 4 games for social significance (numbers relating to birthdates, anniversaries, etc.) as reported by the respondents. In addition to lottery players selecting their own
numbers, one respondent suggested that some players prefer to pencil in their number selections instead of either having them selected by the lottery terminal and entered into the lottery system by an employee. These were the only comments about large jackpot games. It is important to note that despite much of the research on these types of high jackpot / low odds games, there was little that the informants provided about these games outside of brief comments that seemed to indicate the prevailing trend of syndicate play in these types of games. (The comment on syndicate play expanded the understanding beyond family and work connections to include institutional purchasing arrangements (nursing home residents, for example).

**Perceptions of Lottery Profits Distributions.** Interview data revealed informative perspectives about the distribution of lottery revenues in addition to general lottery perceptions. All of the participants viewed the lottery with great suspicion, both as a state-run institution and as a mechanism to fund public schools. The respondents disclosed a general sense that there was an advertised connection between lottery profits and financial resources directed to schools, but the specifics of those perceptions varied greatly. One respondent suggested that

… since the lottery has started [schools have] … gotten $17 billion, that’s with a “b” to the school districts, to the state of Ohio. Unless it’s gone up since I heard the last time it’s probably the first of the year. It’s $17 billion. … Whatever we sell we get a percentage and then anything else goes to the lottery commission. Whatever the district gets is what they get and it’s not set up the same. Like Columbus City, Cleveland, Cincinnati, the larger cities get a better share of it
because there is more schools. But when you get to the smaller schools or districts probably like Steubenville some places like that they’re not going to get as much.

… It’s for the children’s education. It’s not for extra-curricular activities. It has to be for the school itself and the students, more teachers, better salaries; probably some of the districts will buy new supplies, desks ya know.

Another respondent suggested great suspicion of lottery finance as it connected to public education. He claimed that

… [the lottery] pay[s] out a lot of money to the schools. And I really believe… but I think the schools have such a heavy waste program going the money is wasted. The schools are run very inefficiently and no one really knows what is going on and how the money is wasted or they don’t bring it to the attention of the tax payers. It’s wasted… I think they give them a certain percentage of their overall take. That’s how it figures out. I think it is way up into the billions now that the lottery has supported the schools. The more money the schools got the more they waste… I think there’s a lot of people, high executives, that have gotten very wealthy with the lottery. I don’t think… I think the lottery has paid out so much to the schools just to gratify and satisfy people. And said that the lottery is really doing something but any one you ask will ask where is all this money going to that schools are getting. Because the schools got some fairly well educated people there that know how to screw everybody out of their money.

Another less acerbic response about how the lottery and education finance are connected suggested that
I guess they are supposed to give so much of a percentage to schools and then I have no clue… As far as I know they pay the retailer so much of a percentage than [?] they pay for the schools which I guess they do pretty good things with the money… [I guess lottery money can] [h]elp build new schools, books, computers, whatever, you know what I mean? … [Y]ou would think [it is a good deal for schools] … except for our school systems that seem to be crappy. If people are going to gamble one of the good places to stick it would be in education. I’m sure they pay out a lot. If someone wins the mega you are talking about millions of dollars. I’m not saying the lottery doesn’t make money but they sure do put out a lot of money too. Prizes… The tickets themselves are thousands of dollars in winners. I don’t know how much they actually make for themselves, but I know they pay out a lot.

Another respondent wondered

[t]hey say some of it goes to schools but I don’t know… I really don’t care actually. I mean they are gonna do with whatever they are gonna do. But everybody is talking about the casino coming in but really it’s the same thing as the lottery.

Finally another respondent was equally as cynical when she suggested

They say it is for the schools? … I don’t know. Maybe it is, but I don’t see the direct benefit of it. I don’t see it.

The third theme that emerged from the interview data is that the respondents certainly make a connection between lottery profits and money to schools in a general sense. The
respondents also indicated that the amount of money forwarded to schools reflects, in their understanding, a percentage of the lottery profits. A number of the respondents equated their distrust of the local school system with their perception of the lottery finance process in general.

Emerging from the qualitative analysis are the following assertions:

(10) Respondents strongly voiced a perspective that regardless of individual consequences, lottery players should be allowed to participate in lottery games as they choose.

(11) Respondents revealed that they feel a strong ability to control the lottery process when they are able to select the numbers they play or the tickets they purchase based on socially constructed or situationally applicable rules and values.

(12) Respondents indicated that they are aware that lottery profits are intended to benefit schools, however this awareness is tempered by a strong suspicion of large institutions like the lottery or school districts.

In conjunction with this awareness was a strong anti-lottery and anti-large school district sentiment.

**Significance of the Findings in the Context of the Sociology of Education**

The findings of both the quantitative and qualitative components of this study are significant because of their impact on issues of equity within the social context of education. In addition the findings are significant within existing sociological theory as Houck (2011) suggested
[w]hen considering finite fiscal resources related to instruction, consensus in the field is that vertical equity should be a dominant concept; students who are poor or in similarly disadvantaged social states should receive the benefits of greater-than-average resource allocation. (p. 272).

This is the standard from which issues of equity can be weighed and measured in the context of the sociology of education as it intersects with school finance and economics. This standard builds on the definitional equity distinctions detailed in Chapter 1 applied within the context of sociological theory.

The qualitative findings of this study inform and extend the scholarship presented in this study represented by the work of Garvía (2007). Garvía (2007) suggested a perspective of lottery play based on the notion that “it has been reckoned that social bonds can partially account for both participation and level of [lottery] play” (p. 607). Lottery participation, as Garvía (2007) suggests, is built on the principle that economic action, as any kind of social action, is not carried out by isolated, wealth-maximizing individuals, but within networks of social relations that facilitate trust and cooperation, define actors’ preferences, and, eventually, have an impact on economic decisions and outcomes. (p. 608)

While Garvía (2007) focused on a European model of syndicate lottery play, his assertions have relevance to the qualitative findings in this study which help to build a sociological understanding of lottery play.

Garvía (2007) limited his discussion to European syndicate play. Connecting the findings of this study to Garvía’s (2007) claims that social relationships drive lottery
participation involves an understanding of the combined findings of this study. The quantitative findings suggest that the “actors’ preferences” (Garvía, 2007, p. 608) are driven by socially constructed categories of race, education, and economic class. The qualitative findings, focusing on lottery participation among working-class less affluent participants, were devoid of conversation considering syndicate play for high jackpot games. The interview data did, however, point to the understandings of participants of instant games and Pick 3 and Pick 4 games. These games are supported more by than other lottery games by those with less economic resources. Extending his work, Garvía (2007) seemed to imply that the “social action” (p. 608) in the context of social network explains lottery participation. While the findings in this study reify Garvía’s (2007) sociological theory of lottery play, the specific elements of that decision making process were not evident. The findings in the present study suggest that while lottery play is a “social action” (p. 608) as Garvía (2007) described, the process of selecting numbers for Pick games and cards for Instant games was an individual decision. Principles of syndicate play do not completely transfer from Garvía’s (2007) analysis to the findings of the present study.

In addition, the findings of the qualitative findings of the study suggest that the explanation of lottery play may not be uniformly experienced for all participants. While rational choice theory may explain some levels of participation (either financial gain or some other realized experience based on cultural capital), the data also suggested other explanations. More research is needed to understand lottery participation from a qualitative perspective in the context of sociological theory.
In Chapter 1, in the context of the consideration of the social context of educational inequity, Condon and Roscigno (2003) suggested that spending patterns in Columbus City Schools impacts academic achievement. Suits Index analysis overwhelmingly suggests that all lottery games in each year studied were regressive. Lower income lottery players participate to a greater degree than do their wealthier contemporaries. Double-log regression analysis affirmed the impact of income on lottery participation, but also revealed that education and race (non-African American minorities) contribute disproportionately to increased lottery activity. These findings indicate that the lottery contributes to a redistribution of financial resources. The lottery is then acting as an implicit regressive tax on Ohio’s poor. In the context of Condon and Roscigno (2003), the Ohio lottery acts to perpetuate, because of the longitudinal nature of these findings, financial inequity and by extension the academic achievement between more affluent and less affluent students. As suggested in Chapter 1, Condon and Roscigno et al. (2006) posited that

[r]esource disparities at both family and school levels translate into inequities in potentially influential investments, most notably household educational items, cultural capital, parental involvement, teacher encouragement and the availability of advanced placement classes. (p. 2135)

The findings of this study - represented by the assertions detailed throughout this chapter -strongly suggest that the lottery acts as an institutional mechanism that perpetuates “foundations of inequality” (Roscigno et al., 2006, p. 2139). Addressing this revenue inequality is the focus of suggestions in Chapter 5.
Chapter 5 addresses the recommendations and suggestions both from a policy perspective and future research that could be employed to measure the impact of the lottery on academic achievement.
Chapter Five: Conclusions

Research suggestions and policy recommendations developed in Chapter 5 are built on the quantitative and qualitative findings outlined in Chapter 4. These assertions forwarded in Chapter 4 suggest that:

(1) The Ohio lottery as a whole has been a regressive means for collecting funds for Ohio schools for all of the years covered in this study (1992-2010) as measured by the Suits Index.

(2) The least regressive games as measured by the Suits Index have been the lottery games that offer the largest payout with the lowest odds of winning.

(3) The most regressive games as measured by the Suits Index have been the lottery games that offer lower prize payout values with higher odds of participants owning a winning games ticket.

(4) Double-log regression analysis shows Lotto games, Instant games, and Pick games to be regressive to varying degrees for each year of the study. Instant games were found to be the most regressive games while Pick games were less regressive with Lotto games being the least regressive games.

(5) Age impacts lottery sales. Double-log regression analysis reveals that older lottery consumers drive increased sales of all three types of lottery games with the greatest magnitude of impact being found for Lotto games while the most statistically significant results revealing a positive connection between older lottery consumers and sales was found for Instant games.
Race has a significant impact on lottery purchases. Contrary to much of the existing literature in lottery scholarship, increased populations of African Americans in Ohio do not drive increases in lottery games sales according to the double-log regression analysis completed in this study. Increases in percentages of Non-African American minorities in Ohio were found to have a positive relationship to increased Lotto sales in most of the years studied.

Gender (increased percentage of males) was shown to lead to increased Instant games’ sales and there is some evidence in a few of the years that the same phenomenon occurs in Lotto games. No connection between gender and Pick games was found.

When regressing levels of education against lottery sales the results suggest that higher educated lottery consumers drove increases in Lotto games and Pick games sales. This finding is not mirrored in most of the existing lottery scholarship.

Double-log regression analysis suggests that purchases of lottery products are found to drive the additional purchase of other lottery products. This complimentary relationship is most significant with Lotto games and Pick games.

Respondents strongly voiced a perspective that regardless of individual consequences, lottery players should be allowed to participate in lottery games as they choose.

Respondents revealed that they feel a strong ability to control the lottery
process when they are able to select the numbers they play or the tickets they purchase based on socially constructed or situationally applicable rules and values.

(12) Respondents indicated that they are aware that lottery profits are intended to benefit schools, however this awareness is tempered by a strong suspicion of large institutions like the lottery or school districts.

Building on the findings in Chapter 4 that the Ohio lottery acts as a redistributive mechanism diverting financial resources away from less affluent areas which impacts academic achievement, budgetary or benefit incidence modeling focuses on the endeavor to provide a commensurate benefit to the most specific sources of lottery revenues. Research recommendations focus on developing school and district level benefit models that allow for lottery profits to be returned to their origins in poorer areas that disproportionately support the lottery. Policy suggestions focus on dispositions (in the context of fungibility and earmarking) that will allow for lottery profits to impact student achievement by increasing the state’s commitment to Pre-K and full-day Kindergarten educational services, class size reduction strategies, and higher education lottery scholarships.

All three policy recommendations build on the findings in this study that the Ohio lottery collects revenues from less affluent zip codes. With fungibility established, revenues collected from less affluent zip codes do not positively impact educational opportunities for Ohio’s poorest students. The policy recommendations offered are built on the foundation that revenues collected from poor zip codes are returned to schools
through Pre-K and full-day Kindergarten opportunities, class size reduction strategies and higher education lottery scholarships.

Before moving to a consideration of research suggestions, it is reasonable to consider why, if the lottery draws disproportionately from the least affluent, the research and policy suggestions accept as an assumption the existence of the lottery? A number of factors weigh into this assumption. As the willingness to accept a state-sponsored lottery reflected a shift in social mores, nearly seven decades later there is no indication that lottery play has fallen out of favor in either a political or social context. On the contrary, nearly every state has some sort of state-sponsored lottery. When the notion of eliminating the lottery in Ohio was discussed by one respondent during an interview, she simply suggested that if people do not play in Ohio they will travel to gamble or they could also play illegal numbers. While a normative perspective built on vertical equity and economic efficiency may challenge the existence of the lottery, the social reality is that the lottery as a form of public finance will continue into the foreseeable future across the country.

**Research Suggestions**

**Benefit Incidence Analysis.** In the second wave of lottery scholarship, Borg and Mason (1988) outlined theoretical arguments and a practical methodology to consider both the revenue and expenditure implications of the lottery in the context of equity. They argued that “[r]egardless of the stated equity implications of the [lottery] tax… they fail to analyze
the states' uses of the funds, and, thus, the demography of the beneficiaries” (p. 75). They argued that despite the previous nearly two decades of lottery research at that time, lottery scholarship had largely ignored who receives the benefit of lottery expenditures.

Developing a regression equation to examine benefit incidence, Borg and Mason (1988) suggested that increases in age, decreases in education, and decreases in income all drive increased lottery sales. They concluded that the Illinois lottery was a regressive means to raise funds for public education. Turning to the expenditure side of the lottery finance equation, Borg and Mason utilized regression analysis to support their conclusion that “those people who play the lottery most receive very little direct benefit from the education that the lottery funds” (1988, p. 78). Important in the development of their model is their estimation of the amount of lottery contribution based on a per-student value. While Borg and Mason (1988) estimated these values in their model, contemporary data allow for a more precise measurement of per-student contributions at the zip code (and by extension the school and district) level of analysis. Their conclusion offers promise for developing a model to address tax incidence regressivity when they suggested that “[a]nalysis of this question depends on the costs of the funds raised and the degree to which the funds find their way to their designated recipient” (p. 81). While Borg and Mason (1988) also focused on efficiency, their contribution for this study is their emphasis on the ability of joint revenue and expenditure analysis to build towards more equitable mechanisms to negotiate lottery finance.

Building on the work of Borg and Mason (1988), Daberkow (2009a) suggested a model of benefit incidence measurement based on zip code level analysis of per-student
losses of lottery dollars. The model in Daberkow (2009a) is built on estimates offered by the Ohio Department of Education that suggest that lottery profit distributions are supplemental to the existing Ohio school funding formula (Lottery Calculations, n.d.; F2008 Lottery Report for School Districts, Ohio Department of Education, n.d.).

Table 3 of Daberkow (2009a, p. 21) summarized a “Calculated Per Student Benefit Incidence” for an urban zip code on the Southside of Columbus (2008 lottery sales). The table is reproduced below as Table 14. The table reveals that the total sales for the zip code were over $15,000,000.

Table 14.

Calculated Per Student Benefit Incidence – Zip Code 43207

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Lottery Sales</td>
<td>$15,306,160</td>
</tr>
<tr>
<td>Per Student Lottery Sales</td>
<td>$1,833</td>
</tr>
<tr>
<td>% of Lottery Sales Allocated to ODE</td>
<td>31.5%</td>
</tr>
<tr>
<td>Calculated Per Student Benefit (based on lottery sales)</td>
<td>$577</td>
</tr>
<tr>
<td>ODE Estimated Per Student Benefit (based on ODE district allocation)</td>
<td>$253</td>
</tr>
<tr>
<td>Per Student Benefit Gain / Loss</td>
<td>-$324</td>
</tr>
<tr>
<td>Total Student Loss (Zip Code)</td>
<td>-$2,709,023</td>
</tr>
</tbody>
</table>

There are approximately 8,300 school-aged children residing in the zip code which equal a calculated benefit of $577 per student per year. This value is arrived at by dividing the total lottery sales in the zip code by the total number of school-aged children in the zip code. These are values provided by the Ohio Lottery sales report and the U.S. Census Bureau.
The estimated per student benefit based on the Ohio Department of Education lottery resources (Ohio Department of Education, 2008a; Ohio Department of Education, 2008b) suggests that ODE only calculates a per student benefit of $253 for students in that zip code based on their attendance in Columbus City Schools. This is assuming that the lottery profits actually do catalyze a dollar-for-dollar increase in education spending which is called into question in the work of Garrett (2001). Garrett (2001) will be considered more fully later in Chapter 5 as policy recommendations are presented.

The net loss per student realized in the zip code is $324. The total loss of dollars through the lottery is over $2.7 million. These values represent the total dollars that are collected by the Ohio Lottery minus the amount of money the Ohio Department of Education estimates is returned to education through the state funding formula. Not only is this an inefficient mechanism of school finance (as suggested by Borg & Mason, 1998) the end result is that an examination of benefit incidence points to greater regressivity than would be considered with simply a revenue or tax incidence assessment. When this preliminary model (Daberkow, 2009a) is considered in conjunction with the comprehensive findings in this study, the impetus for further research into the tax and benefit incidence of the Ohio Lottery seems clear.

In sharp contrast to the data from the 43207 zip code, for illustration purposes, the results of 43207 zip code are considered against 43054 zip code. Per student lottery sales are calculated at $6.20.\textsuperscript{20} Ohio Department of Education (2008b) suggested that zip code 43054 (predominantly represented the New Albany-Plain Local School District), received

\begin{footnote}
\textsuperscript{20} $29,369 in lottery sales FY 2010 divided by approximately 4,736 school-aged children in zip code 43054 provides an estimate of $6.20 per student lottery sales.
\end{footnote}
$50,331 in lottery allocations which equaled $10.63 in lottery distributions. The comparison between the net loss from 43207 zip code and the net gain from 43054 zip suggests that more research is needed to exactly determine how lottery revenues are collected and distributed. Both zip codes were selected because they reflect two extremes of median incomes in Ohio. For illustration purposes they reveal a relationship between sales and distributions that challenges the framework of vertical equity in taxation. While these calculations reflect estimates, more research is needed to evaluation how lottery finance fits within the context of vertical equity.

Whether considered at the zip code, student, school, or district levels of analysis, concerns with the redistribution of financial resources away from poor families and the impact that redistribution has on academic achievement of those most impacted by the regressive nature of the lottery strongly press for the investigation into models that more completely reveal the relationship between lottery revenue and lottery expenditures. The research recommendation to investigate in greater detail the actual tax and benefit incidence loss to less affluent families follows the work of Condron and Roscigno (2003) and Roscigno et al. (2006). While these sociological studies focused on different levels of analysis they concentrated the importance of their work on the role that “institutional resource differentials play a significant role in patterning achievement and attainment differences” (Roscigno et al., 2006, p. 2135). By emphasizing a research priority that includes benefit incidence, an understanding can be developed that describes the specific nature of the redistribution of lottery profits.
Addressing Fungibility of Ohio Lottery Revenues

If the lottery revenue that has historically been collected from Ohio’s least affluent lottery consumers were to result in increased educational expenditures (revealed through benefit analysis suggested in the previous section), the claims of the lottery as an equitable mechanism to raise funds for public education could be substantiated. However, still remaining would be concerns represented in Houck (2011) surrounding vertical equity. Understanding the fungibility of Ohio lottery revenues is crucial to determining how lottery funds should be distributed in order to realize the goal of vertically equitable school finance policy. Considering lottery fungibility takes up the question of whether or not increased lottery revenues drive increased educational expenditures.

Erekson, DeShano, Platt, and Ziegert (2002) differentiated their study of fungibility from previous scholarship by clearly describing the importance of considering the issue of lottery fungibility drawing from a wide spectrum of lottery states. They framed the question of fungibility by suggesting that

[t]he fundamental question becomes whether lottery funds, earmarked or not, enhance the financial support for public education, or merely serve as a substitute for financing from the general fund, freeing these funds to be spent elsewhere.

This latter phenomenon is defined as fungibility. (Erekson et al., 2002, p. 303)

They continued to preface their study by describing the existing fungibility scholarship that strongly suggests the pervasive phenomenon of supplanting education dollars with lottery revenues (Borg & Mason, 1990; Jones & Amalfitano, 1994). In addition, they
briefly described the contribution of Garrett (2001) which will be considered in greater
detail because of its relevance to vertical equity concerns in Ohio.

Erekson et al.’s (2002) contribution to the policy suggestions here do not focus on
the methodology, but rather the results of their analysis. They found that

… regardless of a state’s relative wealth, population, debt pressures, or tax
burden, increases in lottery revenues negatively affect support for public
education. Clearly, lottery revenues are fungible, and general fund revenues
that otherwise would be devoted to education are diverted to other uses….

…I]t must be concluded that voters are not concerned with fungibility or that
they are insufficiently aware of it. (2002, p. 311)

In the context of the qualitative assertions offered in this study, clearly it is a lack of
awareness rather than a lack of concern that drives the continued belief that the lottery
supports educational efforts. While Erekson et al. (2002) forwarded a general
understanding of lottery fungibility, Garrett (2001) offered an important perspective of
lottery fungibility that drives the remaining policy recommendations offered in this study.

Garrett’s (2001) study considering the fungibility of Ohio lottery revenues
strongly suggested that despite the claims of the Ohio lottery in its initial political
promises and throughout its marketing campaigns, Ohio lottery revenues do not
positively impact educational spending. Early in his study Garrett (2001) considered the
claim that earmarking allows for lotteries to increase funds provided to school districts’
revenue streams. It is within this context of the idea that Ohio allegedly earmarks its
lottery profits to increase educational expenditures that Garrett (2001) selects Ohio to measure lottery revenue fungibility.

Using educational expenditure data for the state of Ohio from 1958 through 1996, Garrett (2001) determined how, lottery profits have made an impact, if any on the financial commitment to education at the state level. In addition, Garrett’s (2001) model allows [for] a more precise estimation of the impact of lottery revenues on education spending - do earmarked lottery revenues partially supplant education expenditures, totally supplant education expenditures, or does no supplantation occur at all? The exact degree of fungibility will be measured. (p. 227)

It is important to note before describing Garrett’s results that if any level of fungibility is shown, then the use of the lottery as a mechanism to fund public schools is largely a public finance illusion. Fungibility of lottery revenues would suggest that lottery funds ostensibly collected under the guise of the benefit to public schools are actually used to replace funds diverted from public education made possible by lottery profits.

Garrett (2001) presented two sets of results that frame the policy recommendations of this study. By offering a graphical representation of educational expenditures before and after the introduction of the lottery it is visually apparent that the introduction of lottery funds into the school finance mix in the state of Ohio has not increased the overall commitment of the state to increase financial resources distributed to schools. While Garrett (2001) sufficiently suggested that visual inspection does not close the case on fungibility, certainly the graphical representation does have impact. In
presenting the results of his statistically sophisticated fungibility test, Garrett (2001) concluded

that education expenditures are completely fungible. Since the first full year of lottery operation it appears that net lottery revenues to education have not increased education expenditures. Initial education expenditures have been fully supplanted by net lottery revenues, with existing expenditures in an amount equal to lottery revenues diverted to other uses. (p. 236)

These results significantly contradict the initial funding expectations and political promises of the Ohio lottery. Instead of improving the financial resources that are available to Ohio’s schools, the findings that the Ohio lottery’s revenues are completely fungible, tied with findings in this study that the lottery collects its revenues from the least affluent lottery consumers requires that policy recommendations address not only who funds lottery sales, but also how lottery revenues are distributed. This will be addressed in the final section of this chapter.

Garrett (2001) continued his assessment of the findings of his study by suggesting that

[t]he empirical findings here provide evidence that earmarked net lottery revenues for education in Ohio have not led to an increase in education expenditures. Educational expenditures appear to be offset by the full amount of net lottery revenues, thus suggesting that earmarking of lottery revenues provides no guarantee that expenditures on the targeted source will in fact increase.
Garrett (2001) continued, offering a foundation for the specific policy recommendations of this study. He argues that

[t]he fungibility of education revenues also has implications for the budgetary incidence of the lottery tax. Although lotteries are generally accepted as regressive, if poorer individuals receive some benefit from lottery dollars, then the incidence of lottery financing would tend to be less regressive. However, for the budgetary incidence of a lottery to be less regressive requires that lottery revenues are indeed allocated to their intended source. As shown here, if lottery revenues do not improve education expenditures (from which poorer individuals receive a greater benefit from state provision), then there is no change in the distributional burden of lottery expenditures. The distributional burden of lottery expenditures remains the same after lottery introduction. (p. 237)

The goal of the policy recommendations that follow is to address the findings of regressivity in the context of issues of vertical equity. In order to accomplish this goal, with a clear view of how the issue of fungibility has negated the professed impact of lottery profits, specific remedies must address both tax incidence regressivity and lottery revenue fungibility.

**Policy Recommendations**

The school finance policy recommendations follow from a disposition that endeavors to distribute lottery revenues in such a manner as to address the findings of regressivity of tax incidence and the fungibility of lottery revenues.
The policy recommendations begin at the state level with a recommendation to reconsider the cuts in Pre-k and Kindergarten allocations of the past two state budgets. This recommendation would benefit all students in that age demographic across the state irrespective of economic status.

The second policy recommendation is focused on reducing the class sizes of the poorest schools and districts in Ohio. With decades of lottery revenues disappearing from these districts, class size reduction as a policy goal aims to address the achievement gap that this study suggests is widening with the lottery as a mechanism of redistribution.

The third policy recommendation is directed at individual students with educational origins from schools and districts that disproportionately drive lottery sales. This policy recommendation is modeled after the early versions of the Georgia’s Help Outstanding Pupils Educationally (H.O.P.E.)\textsuperscript{21} scholarship and the South Carolina Legislative Incentive for Future Excellence (LIFE) and South Carolina Hope\textsuperscript{22} scholarships that provide college tuition subsidies. Figure 5 shown below suggests the proposed lottery distribution recommendation mix in graphical form.

All three policy recommendations are presented with the realization that lottery fungibility needs to be addressed before any new programming to address regressivity.

\textsuperscript{21} For more information see the Georgia lottery outline of the H.O.P.E. scholarship at http://www.gacollege411.org/Financial_Aid_Planning/HOPE_Program/_default.aspx

\textsuperscript{22} For more information see the South Carolina Commission on Higher education at http://www.che.sc.gov/New_Web/GoingToCollege/HOPE_Hm.htm
can be implemented. Garrett suggested one possible option to address the problem of the fungibility of lottery revenues. He offered that

[0]ne strategy is to earmark lottery revenue to a scholarship fund or some other expenditure category which, in the absence of the lottery, did not exist… All lottery revenues [then] go into a scholarship fund. Because the scholarship fund did not exist prior to the lottery, it is very easy to track (match) lottery revenues in the scholarship fund because there are no other state monies going into the scholarship fund – lottery revenues are quite visible. [In summary,] [o]ne legislative fix for the fungibility of lottery revenue is for legislators to enact laws

*Figure 5. Proposed Ohio Lottery Distributions*
that earmark all lottery revenue to a previously unfunded program.

(T.A. Garrett, personal communication, March, 7, 2012)

Once fungibility is addressed, specific initiatives can be implemented to address regressivity.

**Extended Commitment to Full-Time Pre-K and Kindergarten.** Certainly it is convenient to allow the issue of Pre-K and Kindergarten programming to become politically charged. It is important to note that in the past two years Pre-K programs have received less state funding and the full-day Kindergarten mandate has been eliminated. While the administration of Gov. Strickland (2007-2011) approved cuts to Pre-K funding, the administration of Gov. Kasich (2011-present) has encouraged the removal of the full-day Kindergarten mandate. Funding Pre-K opportunities and full-day Kindergarten classrooms for Ohio’s young students can be elevated beyond the political arena when considered in the context of the promise of an educational return on investment provided by the focused input of early childhood education dollars. Duncan and Murnane (2011) provided an insightful and powerful description of the importance and benefit of addressing the poverty-driven achievement gap early in the academic career of less-affluent students. Drawing from the work of Deming (2009), they suggested that “the benefit-cost ratios are favorable” (p. 16). This policy suggestion is connected to lottery revenue and distribution because of the impact of Pre-K funding opportunities for Ohio’s poorest students. Richards (2012) suggested that “[t]his year’s report [from the National Institute for Early Education Research, 2011] says that Ohio spends a little more than half per child what it did 10 years ago: $3,942 per pre-kindergarten child. Only 2 percent of
the children who are eligible — they live in poverty — are enrolled in a state-funded preschool” (http://www.dispatch.com/content/stories/local/2012/04/11/drop-in-public-preschoolers-in-ohio-is-biggest-in-nation.html).

Estimates to fund the Ohio Evidence-Based Model [EBM] requirement of full-day Kindergarten for each school district in the state suggest that the cost would rise to nearly $200 million (Starzyk, 2009a). The findings of the present study strongly suggest the importance and relevance of this policy recommendation. This is the only policy recommendation that does not rely on a prioritized distribution of lottery funds (in contrast with class size reduction and higher education scholarships) because of the importance of full-time Kindergarten and associated benefits to all students. Students that would not benefit immediately from the first policy recommendation could potentially benefit from the class-size reduction found in the second policy recommendation or the higher education lottery scholarship presented in the third policy recommendation. As one Ohio superintendent lamented, “a lot of research shows full-day Kindergarten is very beneficial to kids… But there are a lot of districts like us that are going to have to find ways to make it happen” (Starzyk, 2009b, para. 7). My policy recommendation is to direct the required financial resources to Ohio’s schools to facilitate the realization of full-time Kindergarten in all of Ohio’s school districts.

In addition to fully funding the Ohio EBM mandate of full-time Kindergarten, the findings of this study suggest an extended commitment to fund Pre-K programs

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23 See Odden, Goetz, Picus (2007) for a more detailed explanation of the framework developed for the Ohio Evidence-Based Model.

24 See Cohen (2005) for a more detailed examination of the scholarship associated with the benefits of full-time Kindergarten.
throughout the state that were cut in the most recent economic down-turn reflected in the most recent biennial 2010-2011 state budget. Estimates to fully fund the pre-financial crisis commitment of the state of Ohio to its Pre-K programs places this commitment at $150 million (Guernsey, 2009).

**Class Size Reduction in Economically Disadvantaged Schools.** The political debate over class size reduction and its ability to improve academic achievement is beyond the scope of this study. However, Daberkow (2007) suggests a framework for considering the class size debate which helps to inform the academic benefits of this policy recommendation.

Daberkow (2007) has suggested the scientific management movement has had an impact on the class size debate as expressed by Callahan (1962). Pressure exerted by the business community endeavored to apply a manufacturing model to the education process. From this perspective, maximizing outputs while minimizing inputs in order to optimize profits is the prescribed mode of business analysis. In the educational experience this has translated in pressure to maximize class sizes.

Daberkow (2007) also highlighted three major class size reduction initiatives in Tennessee, California, and Wisconsin. One of the key findings from the Tennessee STAR (Student Teacher Achievement Ratio) initiative points to the potential benefit of class size reduction driven by lottery profits. Offering her evaluation of the Tennessee initiative, Boyd-Zaharias (1999) presented the following analysis that suggested that smaller classes made the biggest difference for inner city, low-income minority children. However, *all* students benefited from the experience,
regardless of their ethnicity, gender, socioeconomic status, or the location of their school. (p. 3)

Research in Tennessee suggests that Ohio’s poor, who drive lottery sales, would potentially stand to benefit the most from smaller class sizes. It is for this reason that this policy recommendation is directed towards schools and districts that reflect the lowest financial resources. Lottery revenues are collected from Ohio’s poorest geographic areas. The class size findings from Tennessee STAR strongly suggest that targeted class size reduction in Ohio’s poorest classrooms would address issues of vertical equity driven by how lottery revenues are collected.

The California CSR (Class Size Reduction) initiative also offers important lessons for the policy recommendation forwarded in this study to reduce class sizes. California struggled to recognize achievement gains enjoyed in Tennessee largely due to the inexperience of the teachers brought in to implement California’s class size reduction initiative. California applied its initiative on a larger scale and did not take into account the limitations of drawing from an inexperienced pool of teachers. This lesson helps to substantiate the limited investment of lottery profits (25%) in class size reduction strategies in Ohio. There is a danger that by implementing a large scale class-size reduction strategy in Ohio (including all districts), the more experienced teachers would move towards newly created teaching positions in wealthier districts with smaller class sizes. In other words, if all of the school districts in Ohio were to have vacancies in

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25 Driscoll and Fleeter (2005) may seem, on the surface, to contradict this claim. It should be remembered that mobility data described by Driscoll and Fleeter does not compare to the institutional shift that a large-scale class reduction initiative would generate (as in California for example). Even with their claim that
primary grades, the wealthier districts would attract more experienced teachers from less-affluent districts. This is the lesson from the California CSR initiative. This would leave less-affluent student populations to be taught by inexperienced teachers in poorer schools and districts. My policy suggestion with class size reduction in Ohio is to limit the investment of lottery dollars to reduce class sizes to less wealthy school districts.

The Wisconsin SAGE (Student Achievement Guarantee in Education) initiative offers important lessons for the policy recommendation in Ohio. Implemented on a smaller scale, as suggested by Daberkow (2007), achievement gains were realized in Wisconsin in similar fashion in Tennessee. An important distinction as Daberkow (2007) suggested, was that in/under

- a rigorous academic curriculum to improve academic achievement…[.,] [schools were required to] stay open from early in the morning to late in the day [in order to] collaborate with community organizations to provide educational, recreational, community, and social services… [in addition to] staff development and accountability mechanisms. (Smith, Molnar, & Zahorik, 2003, p. 1)

This is another key element to be implemented in the class size reduction in Ohio funded by lottery profits.

The second policy recommendation is to implement a class size reduction initiative approaching the goals of the Ohio EBM. To fund these class size goals, the poorest schools and districts would receive a distribution of the financial resources equivalent to a quarter of lottery profits. This commitment would extend beyond the

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urban teachers tend to stay in urban districts, they also found that urban districts experience “the highest rate of attrition… when compared to all other district typologies” (p.9).
current accounting for poverty in the state funding formula. Scarce lottery resources impose significant financial limitations to the implementation of the Ohio EBM class size reduction initiative. Lessons from Tennessee, California, and Wisconsin strongly suggest that the class size reduction initiative be implemented to maximize academic achievement in Ohio’s poorest schools on such a scale as to avoid the large mobility problems caused by the California initiative. In addition, a rigorous curriculum, as offered in Wisconsin should be employed in Ohio.

This study strongly argues that the regressive tax incidence combined with revenue fungibility draws money out of poorer schools and districts. The second policy recommendation aims to direct lottery profits to the schools and districts that disproportionately support lottery sales in an effort to close the achievement gap between poorer and wealthier students. Reardon (2011) described the growing gap between the academic achievement of wealthy and less affluent students. The Ohio lottery has contributed to the reproduction of the gap by removing financial resources from those schools and districts in greatest need. Class size reduction strategies address this educational equity need.

Ohio’s Higher Education Lottery Scholarship. The third policy recommendation built on the findings of this study includes a commitment to offer a higher education lottery scholarship to students coming from schools and districts that represent disproportionate contributions to lottery profits. Not coincidentally these areas also reflect student populations that under-achieve when compared to their wealthier contemporaries. Bailey and Dynarski (2011) described how the gap in higher education
achievement between wealthy students and less affluent students has grown during the past seven decades.

The lottery scholarship is developed from the model offered in response to the profits from the South Carolina lottery and the Georgia lottery. In sharp contrast to the eligibility requirements of the scholarships offered in South Carolina, the Ohio lottery scholarship would not be based on merit exclusively, but would also be awarded based on need, that is, a student’s connection to a district or a school that disproportionately has contributed to lottery profits. This policy recommendation is directed at addressing issues of vertical equity in higher education. Admittedly, this policy recommendation may be under-funded considering the expenditures that South Carolina reports for its scholarships (South Carolina Budget and Control Board, 2011).

All three policy recommendations are based on the premise that the lottery removes financial resources from less affluent schools and districts and the lottery profits then disappear into the state education budget supplanting educational expenditures that would have otherwise been made. This assumption is further developed in the context of sociology theory of stratification. Roscigno et al. (2006) framed the significance of these

\(^{26}\) The form of the association between the student and the less-affluent district or school necessary to qualify for an Ohio lottery higher education scholarship is certainly an important point to consider. Mechanisms currently in-place determine the assignment of a student for Ohio Achievement Assessment or Ohio Graduation Test purposes that could have important contributions to determining a student’s home school or home district for the purposes of lottery scholarship eligibility. For example, it is conceivable that a student’s home school (for lottery scholarship purposes) could be determined by where the student is attending high school when they pass the Ohio Graduation Test. Other states also offer insight in the way that they determine state eligibility for scholarships. South Carolina, for example, requires that students be residents of the state of South Carolina only at the time of high school graduation and college enrollment to meet the state residency requirement. Further eligibility requirements are detailed at: http://www.gacollege411.org/Financial_Aid_Planning/HOPE_Program/_default.aspx.
proposals in the context of the “analyses of stratification… [and] for theory pertaining to
the institutional foundations of inequality” (p. 2139).

**Summary and Conclusions**

In Ohio, the findings of this study strongly suggest that the past two decades of
lottery sales have been disproportionately collected from the least affluent lottery
consumers. The games that offer lower odds and larger payout have been shown to be
less regressive than games which provide comparatively more immediate results. The
findings of this study also point to the demographic groups which drive increases in
lottery sales which include age, non-African American minorities, and gender (more male
participation than female). In addition, lottery consumers provided qualitative evidence
that, despite the impact on the personal financial lives of participants, lottery consumers
should not be regulated in their consumption habits. Respondents also suggested that they
feel control over certain games, most specifically the Pick games and the Instant games.
Finally respondents suggested that they have some notion that lottery profits benefit
schools, but they also voice a suspicion of the system in place to both administer lottery
operations and the school districts that they believe receive lottery revenues.

In order to move towards a more equitable distribution of lottery revenues, the
issue of the fungibility of lottery revenues must be addressed. The research
recommendation that proceeds from this study suggests that benefit incidence should be
considered at the school and district level. To accomplish addressing the benefit
incidence of the lottery, policy recommendations include restoring the full-day
Kindergarten mandate that would be funded by lottery profits in addition to funding
Pre-K programming in the state of Ohio. In addition, the policy recommendation is forwarded to address class size reduction in the most economically disadvantaged districts and schools in the state. The final policy recommendation is to create a higher education scholarship in the state for students that come from Ohio’s poorest schools and districts. While the promise of the lottery to positively impact education funding in the state of Ohio has largely been unrealized, the opportunity still exists to frame the Ohio lottery as a mechanism to address issues of vertical inequality and reverse the reproduction of social inequity in public education.
References


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Appendix A: Interview Schedule for Ohio Lottery Qualitative Pilot Study

INTERVIEW SCHEDULE

Background Information

1) Age
2) Gender
3) Race
4) Education
5) Geography
6) Work history
7) Living arrangements (members of household)…

Consumer Behavior

8) What is your experience playing Ohio lottery games?
9) What do you think about the lottery?
10) What type of games do you play?
11) How often do you play?
12) How much do you wager when you play?
13) Have you ever won?
14) What did that feel like?
15) Why do you play Ohio lottery games?
16) Have your lottery purchases changed overtime or have you always played with the same frequency and quantity of money as you do now?
17) How often do you think about the lottery when you are not directly engaged in buying lottery products?

18) Do you think you will win enough money to someday retire and not work again?

19) What would you do with all of the money if you won?

20) Do know anyone that has ever won the lottery?

21) How do you think your family and friends perceive the lottery?

22) If you asked them the same questions we are talking about, what do you think they would say?

23) Where do you buy your lottery tickets?

24) Do you ever watch television shows or news shows about the lottery?

25) If you won, would you take a lump sum payoff or would you want to get a little bit each year?

26) Do you engage in other forms of gambling, i.e. Riverboats, Las Vegas, friendly card games, sports betting, online gambling?

27) Have you ever regretted spending money on lottery games?

28) What would you do with your money if lottery tickets were not available to be purchased?

29) What else do you usually buy when you purchased your lottery products?

**Distribution of Lottery Revenue Perceptions**

30) What do they do with all of the money that they get from lottery sales?

31) How much goes to (administration, prizes, education)?

32) How much of the prize money do winners eventually get?
33) Do you think that the money is fairly distributed?

General Lottery Perceptions

34) Is the lottery fair to both winners and losers?

35) What could be done to make the lottery better?

36) Do you plan to continue to play the lottery?

37) What would you teach your children about the lottery?

38) Do you think a private company should run the lottery or should the State of Ohio operate the lottery?

39) If Ohio did not have a lottery, would you go to other states to play the lottery?
   Under what circumstances would you travel out of your way to buy a lottery ticket?

40) Do you think that the lottery is morally right?

41) Are there any differences in the games when you think about the questions we have talked about?

42) What do you think about people that win the lottery but eventually end up with no money?

43) Who usually plays the lottery?

44) Do you consider yourself a “lucky” person in life?

45) What else do you think about the lottery in general that you would want to talk about or that is important that we know?
Appendix B: Interview Informed Consent

Ohio University Consent Form
Title of Research: Qualitative Dimensions of the Ohio Lottery
Principal Investigator: Kevin S. Daberkow
Co-Investigator: 
Department: Educational Studies

Federal and university regulations require signed consent for participation in research involving human subjects. After reading the statements below, please indicate your consent by signing this form.

Explanation of Study
The purpose of our research is to gather interview data that help to explain the perspectives of those who play Ohio Lottery games. By understanding these perspectives we are able to construct policy recommendations for the Ohio Lottery that will allow for the equitably and fair collection of lottery revenue and distribution of lottery funds.

To collect these perspectives we will be interviewing adults who represent both typical and deviant lottery players. We will utilize convenience sampling to interview participants from zip codes that historically play lottery games in large concentrations, in addition to zip codes that have tended to not contribute to lottery sales.

The interview will last no longer than 60 minutes.

Risks and Discomforts
It is possible that certain subject matter may be discussed that could be uncomfortable or distressful. These subjects could include, but are not limited to concerns of gambling addiction, corresponding results on family, and financial concerns.

Benefits
Benefits to the respondent include an opportunity to have their voice heard in such a way that may contribute to re-alignment of policy that focuses on equitable and fair treatment of both the lottery revenue and expenditures in addition to the business practices employed in each endeavor.

Confidentiality and Records
Both the transcript of the actual interview and the audio of the interview will remain in the exclusive control of the primary investigator until the research is complete. Once the data has been analyzed, the original interview transcripts will be kept in a locked file cabinet for future reference only to be accessed by the principal investigator.

Compensation
There is no compensation provided for participation in the research.

Contact Information
If you have any questions regarding this study, please contact (Frans Doppen, Ph.D., Ohio University, 740-593-0254 email doppen@ohio.edu).

If you have any questions regarding your rights as a research participant, please contact Jo Ellen Sherow, Director of Research Compliance, Ohio University, (740)593-0664.

I certify that I have read and understand this consent form and agree to participate as a subject in the research described. I agree that known risks to me have been explained to my satisfaction and I understand that no compensation is available from Ohio University and its employees for any injury resulting from my participation in this research. I certify that I am 18 years of age or older. My participation in this research is given voluntarily. I understand that I may discontinue participation at any time without penalty or loss of any benefits to which I may otherwise be entitled. I certify that I have been given a copy of this consent form to take with me.

Signature________________________ Date________________

Printed Name____________
Appendix C: Between Games Tax Incidence Difference by Year

Table 15.

1992 Between Games Tax Incidence Difference

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Super Lotto
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1993 Between Games Tax Incidence Difference

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1995 *Between Games Tax Incidence Difference*

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1997 Between Games Tax Incidence Difference

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*Table 21.*
Table 22.

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2001 Between Games Tax Incidence Difference

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**2006 Between Games Tax Incidence Difference**

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2009 Between Games Tax Incidence Difference

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#### 2010 Between Games Tax Incidence Difference

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