

DO EDUCATION TAX CREDITS IMPROVE EQUITY?

by

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TABLE OF CONTENTS

LIST OF FIGURES	9
LIST OF TABLES	10
ABSTRACT	11
CHAPTER 1: INTRODUCTION TO STUDY	13
Background of Study	13
Professional Significance of Study	21
Problem Statement	22
Research Questions	24
CHAPTER 2: LITERATURE REVIEW	26
Neoliberalism and the Privatization Movement	26
Theory of Privatization	30
Privatization of Public Education	40
Choice & Competition Movement.....	43
Comparison of Vouchers & Education Tax Credits	50
Empirical Evidence on Education Tax Credits	56
CHAPTER 3: METHODOLOGY	73
Research Perspective	73
Unit of Analysis	74
Collection of Data	77

TABLE OF CONTENTS – *Continued*

Description of Data.....	78
Preparation of Data.....	80
Test & Measure of Data.....	82
CHAPTER 4: PRESENTATION OF RESULTS.....	89
2005 Results.....	89
2006 Results.....	92
2007 Results.....	96
Aggregate Results.....	99
CHAPTER 5: SUMMARY AND DISCUSSION.....	104
Overview of Study, Problem Statement, and Methodology.....	104
Summary of Results.....	105
Implications of Study.....	108
Recommendations for Future Research.....	111
APPENDIX A: 2005 DATA TABLE.....	115
APPENDIX B: 2005 DESCRIPTIVE STATISTICS.....	117
APPENDIX C: 2005 REGRESSION AND ANOVA STATISTIC.....	118
APPENDIX D: 2006 DATA TABLE.....	119
APPENDIX E: 2006 DESCRIPTIVE STATISTICS.....	121
APPENDIX F: 2006 REGRESSION AND ANOVA STATISTIC.....	122
APPENDIX G: 2007 DATA TABLE.....	123

TABLE OF CONTENTS - *Continued*

APPENDIX H: 2007 DESCRIPTIVE STATISTICS	125
APPENDIX I: 2007 REGRESSION AND ANOVA STATISTICS	126
APPENDIX J: AGGREGATE DATA TABLE.....	127
APPENDIX K: AGGREGATE DESCRIPTIVE STATISTICS.....	129
APPENDIX L: AGGREGATGE REGRESSION AND ANOVA STATISTICS.....	130
REFERENCES	131

LIST OF FIGURES

Figure 1, 2005 Scatter Plot.....	90
Figure 2, 2005 Linear Plot	91
Figure 3, 2006 Scatter Plot.....	93
Figure 4, 2006 Linear Plot	95
Figure 5, 2007 Scatter Plot.....	97
Figure 6, 2007 Linear Plot	98
Figure 7, Aggregate Scatter Plot.....	100
Figure 8, Aggregate Linear Plot.....	102

LIST OF TABLES

Table 1, 92 Arizona Unified School Districts.....	75
Table 2, Unit of Analysis compared to the State of Arizona.....	77

ABSTRACT

In 1997 the Arizona legislature passed a public education tax credit bill that allowed state income tax payers a dollar-for-dollar tax credit for donations to public schools for extracurricular activities and character education programs. In the haste to get the bill passed there was no time for legislative review, staff analysis, or public scrutiny on the potential impact of the proposed bill. There should have been concern raised on whether the public education tax credit bill would result in an equitable distribution funds given that it was unlikely low-income families would participate, there was no guarantee that middle and upper-income families would designate their contributions to the neediest schools, and state law prohibited any redistribution of funds by school districts.

This study quantitatively examined the distribution of education tax credit revenues in terms of student poverty/wealth among unified public school districts in Arizona over a three year time span. The relationship between per pupil education tax credit revenues and the percentage of students eligible for the free/reduced meal program was tested and measured among 92 unified public school districts using correlation and regression analysis for 2005, 2006, and 2007. By statistically examining the distribution of per pupil education tax credit revenues in terms of student poverty/wealth among unified public school districts in a time-series manner, the study aimed to determine if the public education tax credit program in Arizona had resulted in an equitable distribution of funds.

The results of the study yielded the following findings. One, there was a strong negative association between the two variables of interest ($r = -.58, p < .001$). Two, the relationship between variables could be predicated ($Y = -93.366x + 81.3$) and the linear relationship between variables was statistically reliable (.33). Three, there was a negative beta weight ($b = -93.366x$) indicating that as a school district's percentage of the free/reduced meal program increased by one percentage point, the per pupil education tax credit decreased by 93 cents. This suggested that unified school districts with higher percentages of students eligible for the free/reduced meal program received lower per pupil education tax credit revenues.

CHAPTER 1

INTRODUCTION TO STUDY

This dissertation is a quantitative study on the distribution of education tax credit revenues in terms of student poverty/wealth among unified public school districts in Arizona over a three year time span. The relationship between per pupil education tax credit revenues and the percentage of students eligible for the free/reduced meal program was tested and measured among 92 unified public school districts using correlation and regression analysis for 2005, 2006, and 2007. By statistically examining the distribution of per pupil education tax credit revenues in terms of student poverty/wealth among unified public school districts in a time-series manner, the study aimed to determine if the public education tax credit program in Arizona had resulted in an equitable distribution of funds. This first chapter of the dissertation presents the background of the study, the professional significance of the study, the problem statement, and the research questions that guided this study.

Background of Study

The background of the study will include the political genesis of the Arizona Education Tax Credit (AETC) program, a description of the private and public school tax credit, the legal standing of the AETC program, the nature of tax deductions and tax credits, the appeal of education tax credit programs to legislators, and the rationale for focusing on the Arizona public school tax credit.

Political Genesis of the Arizona Education Tax Credit

The Arizona state legislature voted down a school voucher plan for four straight years between 1993 and 1996 (Garn, 1999). Following these defeats, Republican legislators formulated an alternative school choice bill under the guise of education tax credits (Laitsch, 1998). While Republicans were able to garner support in the House, the bill was met with Democratic opposition in the Senate. Moreover, the Chairman of the Senate Education Committee refused to grant a hearing on the proposed legislation over concerns with the bill which compelled Republican supporters and Democratic opposition to negotiate a compromise.

Democrats demanded the inclusion of a public school tax credit provision and Republicans quickly acquiesced. Current Arizona School Administrators (ASA) Lobbyist Michael Smith stated that both Republicans and Democrats in the Arizona Legislature bypassed the Senate Education Committee and subsequent hearing(s) by attaching the bill to an Education ORB (Omnibus Reconciliation Budget) which was embedded and approved as part of a General Appropriation Bill (M. Smith, personal communication, August 13, 2008). As a result, in 1997 House Bill 2074 was passed and signed into law by Governor Fife Symington as Arizona Revised Statute § 43-1089. With this Arizona joined a handful of states that passed similar education tax credit laws during the 1990s. The AETC program allowed Arizona state income tax payers a dollar-for-dollar tax credit for donations to private and public schools.

Private School Tax Credit

According to Wilson (2000) with the private school tax credit, individuals were granted a full and direct credit against state income taxes for contributions up to \$500 to non-profit school tuition organizations (STOs). STOs would reallocate funds in the form of grants or scholarships to be used at K-12 private schools. The private school tax credit was only restricted by the following: (1) taxpayers claiming this credit could not earmark their donation to their own dependent, (2) STOs were to allocate at least 90% of their annual revenue for scholarships or grants, and (3) STOs were to provide scholarships or grants without limiting availability to only students of one school.

Public School Tax Credit

Wilson explains that with the public school tax credit, individuals were granted a full and direct credit against state income taxes for contributions up to \$200 to public schools to be used for extracurricular activities that required a student fee (e.g., band uniforms, equipment for athletics, and/or science lab materials) or character education programs that included instruction in the definition and application of specified character traits (e.g., truthfulness, responsibility, compassion, diligence and the like). The public school tax credit was only restricted by the following: (1) nongovernmental schools, preschools, community colleges, and universities did not qualify, (2) fees were to be paid directly to a public school or district, and (3) if schools decided to establish a central fund held by the school district, then the school district would have to separately account for

the funds from each school and would not be permitted to transfer funds from one public school to another.

Legal Standing of the Arizona Education Tax Credit

According to Moses (2000), soon after the tax credit law was enacted the Arizona Education Association (AEA) and others brought suit challenging its constitutionality on the grounds that it violated the First Amendment's requirement of separation of church and state. In 1999 (*Kotterman v. Killian*) the Arizona Supreme Court upheld by a 3 to 2 vote the constitutionality of the education tax credit law. The majority opinion maintained that a tax credit did not constitute public money because the state never gained actual possession or immediate control over the funds involved (Welner, 2000). The United States Supreme Court refused to review the case and by doing so declined to issue a ruling with direct national consequences on the question of education tax credits (Pardini, 1999).

The Nature of Tax Deductions & Tax Credits

Surrey and McDaniel (1985) were among the first researchers to critically examine tax credits and ultimately viewed provisions such as tax credits and tax deductions as tax expenditures and departures from the normative tax structure. Tax expenditures such as tax credits and tax deductions are embedded in the tax code and represent government spending for favored activities or groups. In effect, tax credits and tax deductions represent monetary assistance provided by the government through the tax

system as opposed to traditional government support through grants, loans, or other forms of assistance.

Tax credits and tax deductions differ in at least two important ways. One, while tax deductions allow taxpayers to make contributions to qualified charitable organizations, tax credits allow taxpayers to redirect funds that would otherwise go to the state treasury to private entities of their choosing. Two, while tax payers contributing to philanthropic organizations receive a deduction from their gross income, tax payers contributing to STOs or public schools receive a full reimbursement in the form of a tax credit.

Welner points out that the dissenting opinion in *Kotterman v. Killian* delineated the difference between a tax credit and tax deduction. For example, if a couple with a combined income of \$60,000 sent \$500 to an STO that couple would receive a tax credit of \$500 and save \$500 in taxes. In this scenario, the tax credit would cost the couple nothing. If the same couple contributed to a charitable organization it could take a \$500 deduction for their gross income. To reduce their taxes by \$500 that couple would need to make contributions on the order of \$13,000.

Appeal of Education Tax Credit Programs to Legislators

Fiscal instruments such as education tax credits represent the latest demand-side privatization reform mechanism to foster an educational marketplace. Education tax credits represent another way of creating private markets in education as tax credits allow

taxpayers the freedom to redirect funds that would otherwise go to the state treasury to private entities of their choosing. Welner reminds us that based on the majority opinion in the *Kotterman v. Killian* case, a tax credit does not constitute public, but rather private money because the state never gains actual possession or immediate control over the funds involved. In this regard, an education tax credit becomes an expression of direct democracy versus an education voucher which is directly allocated through representative democracy.

Education tax credit programs are attractive to legislators because they can support such programs without the same public notice and scrutiny that is typically applied to direct spending programs. Unlike voucher programs, education tax credit programs are typically presented by legislators and construed by the public as a manifestation of tax policy and not education policy. As a result, the public is generally supportive of tax credit programs as they are not seen as competing directly with education budgets nor controlled by government. In the case of the Arizona, broad support was generated for the education tax credit because not only families with children in private and public schools were permitted to designate their donations to STOs or public schools of their choice, but so could citizens with no children or citizens with children that had already matriculated through school.

The appeal of education tax credits over the more volatile alternative of vouchers is evidenced with over 40 states proposing tax credit programs and 7 states including Arizona currently operating such programs. Indeed, education tax credits could gain

traction at the national level with potentially far-reaching impact. As of 2008, the AETC program has remained largely unchanged with a two notable exceptions: (1) the tax credit amount has increased for private schools to \$1000 and \$400 for public schools (joint filers) and (2) a corporate tax credit was passed (Arizona Revised Statute § 43-1183) and instituted in 2006 allowing corporations to make donations to STOs. According to former Arizona School Boards Association (ASBA) President Panfilo Contreras, while the corporate tax credit is limited by statute to \$10 million a fiscal year, there is no transparency of which corporations make contributions and nothing to prevent one corporation from leveraging the entire annual allotted tax credit in a given year to one school (P. Contreras, personal communication, October 30, 2008). Since the passage of the AETC program the revenues generated have steadily increased and in 2007 totaled over \$100 million.

Rationale for Focusing on the Arizona Public School Tax Credit

Originally contributions to public schools did not qualify for the AETC program as the legislative bill restricted the tax credit to a nongovernmental school (secondary or primary) of the parent's choice. However, through a rushed compromise with opponents to the bill the law was finally enacted including a tax credit for contributions to K-12 public schools. According to Scott Mundell, former Marana Unified School District Administrator, despite the passage of the legislative bill, the "educational establishment" was not consulted with nor would they have approved of the public school tax credit provision (S. Mundell, personal communication, November 6, 2008).

Welner notes that while the majority opinion in *Kotterman v. Killian* argued that public schools did not need the same benefits or tax credit since public school students did not pay tuition, the dissenting opinion pointed to deficiencies of state financing of public schools and maintained that public schools like private schools needed assistance to perform their educational mission. Lisa Graham Keegan (2001), former Arizona State Superintendent of Public Instruction, would go on to claim that the inclusion of tax incentives to directly assist public schools helped sell the program not only to the legislature, but also to the public.

From the onset, the Arizona public school tax credit was an after thought. Not part of the original legislative bill and used as a broader strategy to merely sell the intended private school tax credit. According to John Wright, current Arizona Education Association (AEA) President, in the haste to pass the education tax credit bill, there was no time for legislative review, staff analysis, or public scrutiny (J. Wright, personal communication, September 17, 2008). The education tax credit was literally passed in the “Eleventh Hour” before the Arizona Legislature adjourned from session.

Twelve years after the bill’s passage, the public school tax credit has gone largely unnoticed. However, the public school provision of the AETC program is difficult not to notice as public schools throughout the state reported that 211,270 people donated \$43.9 million in 2007. Despite the statewide growth in education tax credit revenues and increasing attempts by public school districts to launch marketing campaigns to tap this new stream of funds, little scholarly attention has been dedicated to the Arizona public

school tax credit program in particular or the handful of education tax credit programs currently operating at the national level in general.

Professional Significance of Study

This section will explain how this study will contribute to the literature, the important relationship between education tax credit revenues and budgetary shortfalls, and the potential implications of AETC program on public policy.

Contribution to the Literature

Based on a review of the literature, research on the AETC program is limited, outdated, and tends to focus on the private school tax credit provision. This study should contribute to the knowledge base by the mere fact that no time-series study has been done exclusively on the distribution of education tax credit revenues in terms of student poverty/wealth among unified public school districts in Arizona. Therefore, this study is timely and should prove relevant to citizens, educational administrators, and legislative member alike that are interested in understanding the true impact of the public school tax credit provision.

Budgetary Shortfalls

Revenues generated by the AETC program continue to steadily grow statewide as public school districts increasingly attempt to tap much needed funds. However, as AETC revenues increase, the state's general tax funds decrease, resulting in fewer

resources for the state to allocate to social programs. This study will shed light on the fact that the state has forgone \$100 million in tax revenue through the AETC program at a time when Arizona faces a budgetary shortfall in excess of \$1 billion dollars.

Implications for Public Policy

Privatized education reforms such as education tax credit programs seductively avoid the larger challenge facing public education in Arizona, which is that school districts are grossly underfunded. However, some school districts are more underfunded than others based on the property tax system. School districts with higher property values tend to generate more tax revenues than do school districts with lower property values. By examining the distribution of education tax credit revenues in terms of student poverty/wealth among unified public school districts in Arizona, this study will examine if the public school tax credit provision is exacerbating funding differentials between higher income school districts and lower income school districts. This study could raise serious questions concerning the appropriateness of the AETC program on public policy if it is discovered that higher income school districts get wealthier while lower income school districts get poorer as a result of the public school tax credit provision.

Problem Statement

The following section will address problems associated with low-income family's participation in a the public school tax credit provision, middle and upper-income

family's not designating tax credits to the neediest schools, and the non-redistributive nature of the Arizona education tax credit law.

Low-income Family's Participation

It would be unlikely that low-income families would participate in the public school tax credit provision. Low-income families would surely struggle to make cash contributions in advance and then wait to be reimbursed. In reality, many low-income families would have little discretionary income and would likely have little if any tax liability, serving as a further financial disincentive to participate. In the end, any cash on hand for low-income families would likely be used on the essentials in life such as food, clothes, and/or shelter as opposed to education tax credits. As such, there should be concern over how low-income families could realistically partake in the public school tax credit provision.

Middle and Upper-Income Family's Designation

It would be expected that middle and upper-income families would participate in the public school tax credit provision. Middle and upper-income families would have more discretionary income and tax liability that could be offset by the public school tax credit. However, there is no guarantee that middle and upper-income families would earmark their contributions to the neediest public schools. Middle and upper-income families would likely designate contributions to their children's schools to enhance their

educational experience. As such, there should be concern over whether middle and upper-income families would designate their contributions to the neediest schools.

Non-redistribution Constraint

Arizona state law requires school districts to use funds as prescribed by donors. Put differently, donors dictate which schools are to receive their contributions and what specifically the money is to be used on. For school districts to stay in compliance with state law it is imperative that they use education tax credit funds as prescribed by donors. While school districts could encourage donors to contribute to schools in greatest need, ultimately it is the donor that decides. In the event some schools receive significant public school tax revenues while other schools receive few, state law would prohibit the redistribution of public school tax revenues by the school district to the neediest schools.

Research Questions

Given that low-income families would likely struggle to participate in the public school tax credit program, there is no guarantee that middle and upper-income families would designate their contributions to the neediest schools, and state law prohibits the redistribution of funds to the neediest schools, there should be concern whether the public education tax credit program in Arizona has resulted in an equitable distribution funds. An equitable distribution of public school tax credit revenues would be evidenced in the per pupil education tax credit revenues received in terms of student poverty/wealth and could be tested and measured among Arizona's unified public school districts using

correlation and regression analysis in a time-series manner. As such, the following research questions guided this study:

1. What is the relationship between per pupil education tax credit revenues and the percentage of students eligible for the free/reduced meal program?
2. To what extent can the relationship between these two variables be predicted and how reliable is the linear relationship?
3. Do education tax credits improve equity?

Before moving into the methodology that will be utilized in this study, it is important to review the literature on the intellectual underpinnings of education tax credits. Ultimately, education tax credits are steeped in the philosophical tradition of privatization which has served as the rationale for the choice and competition movement in public education worldwide. To stimulate market-based reform, demand side mechanisms such as education tax credits in theory expand educational choice of consumers and have been advanced as a strategy to enhance the educational opportunities of families. Attention will now be turned to a thorough review of the literature.

CHAPTER 2

REVIEW OF LITERATURE

This chapter will discuss the influence of neoliberalism on the privatization movement, review the literature on the theory of privatization, apply the theory of privatization to public education, examine the choice and competition movement in public education, compare vouchers and education tax credits, and analyze the history of and empirical evidence on education tax credits.

Neoliberalism and the Privatization Movement

The following section will define neoliberalism, explain the interlocking neoliberal agendas of a few developed western nations, describe how neoliberals planned to reform public education, and link neoliberalism with educational reform and privatization.

Definition of Neoliberalism

The privatization of public education is part of a larger global movement of the last few decades known as “neoliberalism.” Neoliberalism has been likened to market fundamentalism and functions as a regulative force, political rationale, and mode of governmentality (Giroux, 2008a, 2008b). Overall, neoliberalism is an economic doctrine that sees the market as the most effective way of determining production and satisfying people’s needs (Arenas, 2005).

According to Stromquist (2002), neoliberalism resulted in government policies that reduced state spending on social programs, deregulation, and the privatization of the public sector. Within the educational context, neoliberalism led to the general push for choice, competition, and greater efficiencies from the educational establishment. Neoliberal ideology did not only marketise education programs that were once provided by government and supported by taxes, it also agitated trade liberalisation to the benefit of transnational corporations' penetration of local markets (Apple, 2002).

Interlocking Agendas of Developed Nations

Berman (1999) examined the strikingly similar ideological underpinnings of neoliberalism in England, Australia, and the United States. The neoliberal agendas of the Thatcher, Hawke, and Reagan administrations called for minimal governments and advocated for market forces. All three countries implemented the neoliberal agenda of reducing government spending on welfare/entitlement programs, deregulating various sectors of the economy such as utilities, and engaging in different forms of privatization including increased government contracting with the private sector.

With regard to educational reform, these regimes attempted to weaken public control over education while simultaneously encouraging the privatization of public education. All three countries relied on heavy government intervention and mandate to bring about educational reform such as “national standards” despite the apparent contradiction of neoliberal ideology which called for a minimalist government. All three

countries sought to privatize public education on the services side through contracting with private sector vendors and on the delivery side by encouraging for-profit providers to both own and operate schools.

Reform of Public Education

Neoliberals called for reform of public education both worldwide and of particular interest to this paper, within the United States.

Reform of Public Education Worldwide

At the heart of neoliberal discourse were calls for parental choice among public and private schools, subjecting schools to market forces, allowing schools to flourish if they met consumer demands while allowing those that failed to meet consumer demands to wither and die (Guthrie, 1994). According to Ball (1990), neoliberals would encourage the development of private schools, introduce market criteria to the educational establishment, encourage competition among schools, and demand accountability. In all three countries neoliberals exhibited a general distrust of the educational establishment (e.g., teachers and unions) and a general disdain for the public sector ethos.

The public sector was viewed as inefficient and ineffective when compared to the private sector. In order to reform education new private sector principles would need to be infused into the bureaucracy known as public education. Arnove (1999) put the neoliberal agendas into perspective by explaining the dual goals that all three countries

sought: (1) reforming educational institutions for fears of lost competitive advantage in the global markets by aligning education to national economic needs and (2) producing financial savings through refocusing epistemological bases, methods, and procedures of schooling.

Reform of Public Education in the United States

In the United States, the neoliberal agenda for school reform was driven by noneducators that professed the virtues of the market (Emery & Ohanian, 2004). “Managerialism” imported business models and tighter systems of accountability into education to make schools more efficient and akin to business enterprises. By placing more emphasis on rational choice and efficient organization, the education sector was expected to transform and become dynamic, efficient, productive, entrepreneurial, and generally, “lean and mean” (Apple, 2001).

In a similar manner, Tyack and Cuban (2004) described how powerful corporate leaders in the United States advocated for business management principles and attempted to reinvent schools by employing management techniques such as TQM and private sector budgets such as management by objective (MBO), but by also contracting with outside organizations for the purposes of improving performance, using technology to improve education, and restructuring the salary schedule to motivate teachers.

Neoliberalism, Educational Reform, and Privatization

Overall, the neoliberal movement of the twentieth century was concerned with the preservation of authority, traditional institutions, values, and a convergence of interest between neoliberal policies and conservative populism in the form of religious fundamentalism (Apple, 2000). The neoliberal movement consisted of an amalgam of different sets of interests that promoted competition, self-reliance, unbridled freedom, the acquisition of power and wealth, and a return to the halcyon days. For neoliberals worldwide, the lack of consumer choice, lack of market reference, and lack of incentive for performance within public education sector served as ample justification for the privatization.

Theory of Privatization

The theory of privatization will be unpacked by reviewing the epistemology of the privatization, definition(s) of privatization, types of privatization at various levels of government, the theoretical work of the leading privatization scholar, and various privatization mechanisms.

Epistemology of Privatization

Peter F. Drucker was the first to use the term “reprivatization” in 1968. Robert W. Poole would shorten “reprivatization” to “privatization” in 1976. The term “privatization” would first appear in the Webster’s New Collegiate Dictionary (9th ed.) in 1983. The confluence of American enthusiasm with private enterprise and the imperative to limit government spending expressed through “taxpayer revolts” during the late

twentieth century provided a propitious environment for privatization (Kent, 1997).

However, privatization fell short of lofty expectations due to unrealistic comparisons of privatization efforts undertaken in the international arena.

Donahue (1989) points out that in the 1980s Britain, France, Spain, Italy, Japan, and a whole host of other countries began to privatize airlines, auto manufactures, banks, steel and telephone companies and the like. However, the United States never had such extensive state-owned enterprises. Donahue goes on to explain that the United States was the only country with an entirely private telecommunications industry, and one of few countries to have largely private rail, electricity, oil, coal, or steel industries. As such, privatization in the United States would not follow the privatization path of other countries, but rather enlisting the private sector to improve the performance of tasks that would remain in some sense public (Letwin, 1988).

According to Hodge (2000) the enlisting of the private sector to improve efficiency in the government sector in the United States was primed by a wave of efficiency studies which found that the private sector could produce the same services as the public sector at significantly lower cost. These studies were produced largely by economists and welcomed by conservative politicians. However, these studies were also hotly contested by public sector academicians and unions who viewed privatization as deep and real threat. There continues to be significant ideological difference surrounding privatization pitting liberal merits of positive government action and responsibility

against conservative virtues of capitalism and free markets as the best means for achieving public goals (Greene, 2005).

Definition(s) of Privatization

Ramanadham (1993) defined privatization as the marketization of enterprise operations. Ramanadham explained that privatization could be sought through three options: ownership changes, organizational changes, and operational changes. Kolderie (1986) defined privatization as removing the government completely from the provision and delivery of services. Kolderie explained provisions to mean that government made policies, decided on purchases, regulated, franchised, financed, and/or subsidized a service whereas production meant government produced a service and operated, delivered, ran, performed, sold, and/or administered services. Savas (1982) defined privatization as the act of reducing government or increasing the role of the private sector. Savas created a rank of arrangements by degree of privatization with the market on one end of the spectrum and government on the opposite end of the spectrum. For Savas, to privatize meant to move from government towards market (e.g., denationalization, demunicipalization, destatification, and deregulation) whereas to deprivatize meant to move from market towards government (e.g., nationalization, municipalization, statification, and regulation).

Types of Privatization

To illustrate the various types of privatization at the local, state, and federal levels of government Greene provides a few helpful examples.

Local Government Privatization

Local governments might contract with a private company to collect and dispose of residential garbage, sell a municipal golf course to a private company, and/or lease a public hospital to a private hospital management corporation.

State Government Privatization

State governments might transfer the operation of utilities such as electricity to private providers, contract with private firms to run prisons, and/or privatize education by

Federal Government Privatization

At the federal level, the government might allow firms to provide food service on a military base, the postal service might contract with airlines to carry mail across the country, and/or the government's most recent attempt to privatize port security to private, international firms.

Theoretical Work of Emanuel Savas

Based on a review of the literature, Savas was one of the first to engage in a privatization study. While working under New York City Mayor John Lindsay in 1969, Savas learned that the city department responsible for clearing the snow was working only 50 percent of the time during emergencies as a result of various breaks (e.g., warm-

up, coffee, fuel, and wash-up). Savas (1979) would prove through a large-scale study that the true cost of a particular municipal service was 30% greater on average than the amounts reported in the cities' budgets. Savas would later compare the New York City Department of Sanitation with the private sector in and around the New York City area. Savas found that it cost private contractors \$17 per ton to collect refuse whereas it cost the city agency \$49 a ton; nearly three times as much (Savas, 1982). Subsequent studies from Savas found that on average public service delivery is 35 to 95 percent more expensive than contracting even when the cost of administering the contracts is included (Savas, 1987).

Savas (1987) developed indicators of poor performance by government and objectives for privatizing government. Indicators of poor performance included inefficiency, overstaffing, and low productivity; poor quality of goods and services; continuing losses and rising debts of for-profit government enterprises; lack of managerial skills and sufficient managerial authority; unresponsiveness to the public; undermaintenance of facilities and equipment; insufficient funds for capital investment; vertical integration; and obsolete practices or services and little marketing capability. Objectives for privatization included reducing the cost of government; generating revenues by both selling assets and then by collecting taxes on them; reducing government debt; supplying infrastructure or other facilities the government could not otherwise provide; incorporating specialized skills for technologically advanced activities; initiating or expanding services quickly; lessening government interference and

direct presence in the economy; and decentralizing the economy and broadening the ownership of economic assets.

Dissatisfaction and recurrent problems with government agencies, activities, enterprises, and assets led to the demand for privatization by four forces: pragmatic, ideological, commercial, and populist (Savas, 1987).

Pragmatists

For pragmatist the goal was better government with privatization leading to more cost-effective public services. As the cost of government activities rose and the public's resistance to higher taxes rise, privatization became an important tool for better public management and greater productivity.

Ideologue

For an ideologue the goal was less government as big government was viewed as being too powerful and intrusive to people's lives and therefore a danger to society. Government was viewed as a tool to strike a balance between freedom, justice, and efficiency however, excessive government could threaten all three goals.

Commercial Interests

For commercial interests the goal was to redirect government spending towards private firms. Work performed by government employees was not unique for government and capital projects could and should be financed, built, and operated by private firms.

Populists

For populist the goal was to empower people to satisfy their common needs by diminishing the power and influence of bureaucratic structures. Privatization was endorsed because it enhanced choice and strengthened traditional institutions such as neighborhoods, church, and/or voluntary organizations.

According to Savas, several institutions had evolved in society to satisfy human needs including the family, voluntary groups, the market, and government. Human needs were defined as goods that people wanted which could be classified as: private, common-pool, toll, and collective.

Private Goods

Private goods (e.g., clothing) posed no conceptual problem of supply as the marketplace provided them. Consumers demanded goods, entrepreneurs recognized the demand, produced the goods, and sold them to willing buyers at a mutually satisfactory price. Collective action with respect to private goods was confined to assuring safety.

Common-Pool Goods

Common-pool goods (e.g., fish in the ocean) did pose a supply problem as with no need to pay for such a good and with no means to prevent their consumption such goods could be consumed to the point of exhaustion. Ultimately, common-pool goods belong to whoever takes them. Market mechanisms do not supply common-pool goods.

Collective action could be taken to conserve common-pool goods through voluntary agreements among consumers to limit their consumption or by banning the sale of common-pool goods.

Toll Goods

Toll goods (e.g., electric power) could be supplied by the marketplace or government to paying users. Often toll goods are provided by a single supplier or monopoly. For this reason collective action is necessary to create monopolies and then regulate them so owners do not exploit their monopolistic privileges unfairly.

Collective Goods

Collective goods (e.g., public education) present challenges to society. By their very nature, collective goods can be consumed simultaneously by many people and are difficult to exclude users from partaking in. Individuals tend to make full use of such goods without paying for them and without contributing a fair share of the effort required to supply them. As such, if no one volunteers to pay for such goods, surely no one will volunteer to supply them therefore, collective contributions (e.g., taxes) are utilized to obtain such goods.

Savas (1987) also identified two important properties to classify goods: exclusion and consumption. Exclusion implied that a potential supplier could deny a potential user of a good if conditions were not met. Put differently, goods would not “change hands” unless the seller and buyer agreed on the terms. Consumption implied that some goods

could be consumed jointly and simultaneously by many while not diminishing quality or quantity. However, some goods were only available to individuals for consumption meaning that once consumed the good was not available to another.

Private goods were characterized by exclusion and individual consumption. Common-pool goods were characterized by non-exclusion and individual consumption. Toll goods were characterized by exclusion and joint consumption. Collective goods were characterized as by non-exclusion and joint consumption. Private goods and toll goods could be supplied by the marketplace. With private and tolls goods, collective action led to grounds rules for market transactions, safety of goods, and regulation of monopolies. Collective action was necessary to assure the continued supply of common-pool and collective goods, but collective action could also dictate which private and toll goods were to be subsidized and supplied as though they were collective goods.

As noted earlier, collective goods present challenges to society as they hold non-exclusionary characteristics and can be jointly consumed. Again, the marketplace will not provide a good if no one pays for the good. For this reason government is compelled to lead in the production of collective goods. Hence, collective contributions (e.g., taxes) are utilized to obtain such a good. The predominant role of the government providing collective goods leads to a number problems including lack of consumer choice, lack of market reference, and lack of incentive for performance.

Collective goods offer little choice to the consumer and are unrelated to demand or consumption. With a collective good an individual has little choice with regard to consuming the good and generally speaking, has to accept its quality and quantity. Since it was impossible to charge directly for collective goods, payment is unrelated to demand or consumption. Rather than relying on markets for collective goods, the political process determines how much a consumer pays and how the collective good is to be distributed (Tullock, 1965). The lack of competition and lack of reference to the market produces no incentives for the government to measure the performance of an organization charged with providing a collective good. According to Savas, the overall lack of consumer choice, lack of market reference, and lack of incentive for performance made government provided collective goods ideal candidates for privatization mechanisms.

Privatization Mechanisms

Savas (2000) maintained that governments should utilize the following privatization mechanisms with government provided collective goods: (1) contracting, (2) abandonment, and (3) divestment. Contracting, abandonment, and divestment are best understood through the following examples.

Contracting

Contracting to private firms could lead to greater efficiency, productivity, and savings to taxpayers. Contracting with the private sector could be for direct or support services. An example of government contracting for direct services could involve solid-

waste collection whereas government contracting for support services could involve data processing.

Abandonment

Abandonment or turning over many of government functions to the private sector could allow for quick initiating and expanding of services by the private sector.

Abandonment implied a gradual withering of the state and the emergence of the private sector to satisfy people's needs. For example, citizens might avoid or desert public transportation out of dissatisfaction giving way to private transportation such as cabs, vans, or minibus systems.

Divestment

Divestment or selling off public assets could reduce the cost and debt of government. Divestment of public assets was typically a one-time affair and the rarest of the three privatization mechanisms. An example could be the government selling land, buildings or equipment which may no longer be needed.

Privatization of Public Education

The following section will include the rationale for privatizing public education and a review of the various types of contracting that have manifested in public education.

Rationale for Privatizing Public Education

Government financing and delivery of collective goods such as education and the ensuing problems including lack of consumer choice, lack of market reference, and lack of incentive for performance have been echoed by education reformers as a justification for privatization. Of the three privatization mechanisms suggested by Savas (contracting, abandonment, and divestment) the most common manifestation of privatization in public education has been contracting to private firms. This transfer of activities conducted by public employees to the private sector is typically viewed as not only an ideological argument to reduce the role of government, but also a practical management tool to avoid inefficient government activities (Lieberman, 1989).

Types of Contracting in Public Education

In public schools privatization through contracting has occurred with food services, transportation, and maintenance. The outsourcing of food services and contracting with private sector providers to operate buses and maintain school grounds has been commonplace. In such instances the use of non-district and union personnel has been undertaken to reduce costs and enhance efficiency. Nonetheless, Lieberman points out that while contracting out may require fewer government employees to provide a service it might also require an increase in regulatory personnel. While regulation may be presented by educational reformers as an impediment to change, regulation reflects a sincere concern on the part of policymakers that private sector contractors be held accountable to parents and the state for providing a core governmental service. In this context regulation is protecting the interest of citizen stakeholders.

Recently there has been the emergence of educational management organizations (EMOs) that have contracted with public schools to offer educational materials, consulting, and operational services (Buckley, 2005). Public schools have long purchased educational materials from private firms (e.g., text books, assessment tools, and testing materials) however, the recent national push towards common curricula, the continual measurement of student performance, and the rise in demand for tutoring has resulted in educational materials constituting over a \$100 billion market (Brandon, 2002). Educational consulting often takes the form of professional development services for public school staff through EMOs such as Catapult Learning or when an EMO such as Alvarez and Marshall provides services ranging from bookkeeping to report writing to managing virtually every aspect of a public school. In rare instances the contracting out of the whole operation of a school including instruction has occurred, most notably in Philadelphia through the EMO Edison Schools.

While the number of EMOs are on the rise there are questions concerning the efficiency of EMOs operating schools and efficacy of EMOs consulting services. Boyd (2007) found that student achievement results of the schools operated by EMO Edison Schools generally appeared to be no better than those produced by non-profit schools or district schools despite Edison Schools receiving substantially greater funding. Wells and Scott (2001) reported that while EMOs were very attractive to public schools in under resourced areas that were limited in management expertise and in the ability to raise and maintain resources for capital expenses, district offices were often petitioned to end

disputes dealing with control and decision-making with EMOs. Ascher, Fruchter, and Berne (1996) discovered that many schools systems that had contracted out with EMOs for consulting services had become victims of fraud, overcharging, and other forms of corruption. Overall, under resourced public schools in high poverty areas were found to have the weakest bargaining position with EMOs and even worse, lacked the time or resources to oversee their activities.

While a common manifestation of privatization has involved public education contracting with private firms for a whole host of activities including food services, transportation, maintenance, and educational materials, consulting, and operational services provided by EMOs, interpretations of privatization of public education still vary and stretch the very definition of contracting. As it turns out, there is no single privatization, but rather a whole gamut of activities including not only contracting, but also demand side mechanisms such as vouchers plans and education tax credit programs. In short, voucher plans and education tax credit programs are designed to expand educational choice of consumers, enhance the educational opportunities of families, and ultimately generate choice and competition with public education (Levin, 2001). Public education reformers have long argued that to move the educational monopoly to an educational market would require choice for educational consumers and competition among public schools.

Choice & Competition Movement

Attention will now be dedicated to the impetus behind the choice and competition movement in public education, the theoretical contributions of scholars that advocated for choice, competition, and vouchers, and criticisms of the arguments used by advocates of choice, competition, and vouchers.

Impetus of Choice & Competition

Early critics of public education likened public schools to nonmarket-orientated utilities with self-perpetuating bureaucracies due in large part to their tax supported status, certification process for teachers and administrators, and custom of promotion from within (Pincus, 1974). Such fiery rhetoric was then and still is common among public education reformers. More recently the attraction for educational reform has derived from the following shortcomings in the educational system: perceived failure to deliver a quality product, seeming inability of education to heal itself, and a growing disconnect between the public and public education (Murphy, 1999). To break up the educational monopoly, educational reformers have called for deregulation, privatization, and business like management practices that endorsed competition which would result in an array of choices for families (Lubienski, 2006). It is in this environment that the choice and competition movement in public education was born.

Theoretical Work of Milton Friedman

Friedman (1962, 1990) long distinguished between government financing and administering of education. The proper role of government was to finance and not

administer education. Administering of education led to inefficiencies (e.g., the lion's share of budgets going to bureaucrats and not classrooms). Financing would be best under a system of vouchers where all parents could send their children to a school of their choice. Put differently, choice would stimulate competition.

Friedman observed that the better schools were in wealthier communities as the existing school funding system was partly predicated on the valuation of homes which allowed wealthier communities to allocate more resources per pupil than in poorer communities. Poorer families seeking better public schooling had no options since moving to wealthier communities was not possible. As a result, the educational opportunities of poorer children were compromised under the existing system in two respects. One, low-income parents had no choice in the existing system. Two, the denial of intermingling of children of different socioeconomic backgrounds undermined the democratic tradition of our society. It was for these reasons that Friedman proposed the choice-plan.

Friedman advanced the idea of a voucher system and touted such a system as the answer to the inequity in public schools. Through vouchers low-income families would have the option to send their children to private institutions and enjoy the benefits of a superior education. While the public benefits of education justified government funding of education, this did not mean government administering the educational institutions.

Vouchers would provide a specified dollar amount per student per year to both low and high-income families. These vouchers could be used at private schools which would be regulated by the government for quality control. To Friedman, vouchers held the promise of providing choice and opportunity to low-income families. High-income parents that sent their children to private schools had long made arguments that they were being “double-taxed.” Such parents would argue that they contributed to public schools through property tax, but didn’t send their children to public schools, while they paid for private schooling by going out-of-pocket. In the end, both low and high-income families would benefit from vouchers.

Theoretical Work of John Chubb & Terry Moe

Chubb and Moe (1990, 2005) would continue the choice and competition movement 30 years later and be instrumental in the formation of the most prominent and longest-running public school voucher program in the United States, which began in Wisconsin in 1990. Chubb and Moe would argue that the bureaucratic nature of government did not permit autonomy and innovation, and ultimately stifled student achievement. The politics and bureaucracy of government run education would need to be replaced with markets and parental choice. By eliminating student assignment in public schools and allowing each school to operate under the same competitive rules as a private school, students/parents would have choice, thereby creating demand for quality schools, and schools would respond by providing quality education their customer’s desired since the money needed to run schools would follow students to the school of

their choice. If parents and students did not like the services rendered by their current school they could exit and find another school that better met their curricular or environmental needs.

For Chubb and Moe the problems with educational choice were that it meant different things to different people, it focused on the demand and not supply side, and most choice plans were co-opted so as not to threaten the vested interest of the educational establishment which ultimately led to little structural change. The reasons why markets worked to ensure student/parent involvement in private education were that school administrators and teachers had strong incentives to please students/parents, the freedom of students/parents to switch from one school to another when they thought it would be beneficial to do so, and the whole process of natural selection whereby schools that failed to satisfy their clientele would go out of business. Calls for choice and competition from Friedman, Chubb, and Moe are inextricably linked to the launch of voucher plans and relied on a number of assumptions which have drawn sharp criticism.

Criticisms of Choice, Competition, & Vouchers

The following section will include five criticisms of the arguments used by advocates of choice, competition, and vouchers: threat to national interest, greater stratification, flight from public schools, questionable competitive pressures, and dubious efficiency arguments on private schools.

Threat to National Interest

If in fact consumer preferences drive the design of schools and the content of programs then there is the real possibility of the establishment of alternative schools that are not in the national interest (Natriello, 2001). Such a movement would run counter to the Deweyan (1916) concept of a common school. For Hill, Lawrence, and Guthrie (1997) it is the common school that embraces the public interest in schooling by instilling democratic values and imparting basic skills not private and/or charter schools. More often than not, choice leaves out and leaves behind many students and families while allowing the chosen families and students a narrow education (Rud, 2000). As Howe (1997) points out, school choice schemes are actually incompatible with educational opportunity and democracy.

Greater Stratification

While choice plans increasingly make the family the agent of a child's education, choice plans end up serving the interests of the privileged and allowing for a greater divide between those that know how to navigate the system and those who do not (Moore & Davenport, 1990). Put differently, choice plans expect consumers to be informed which is predicated on two assumptions (1) that information is available and (2) that consumers seek out and understand the information provided (Witte, 2000). Schneider (2001) focused on the decision-making process of families in educational choice environments and found that with out careful design and sensitivity to consumers of lower socio-economic status (e.g., lack of access to the internet which is where

information is typically housed or lack of bilingual materials etc.) increased stratification and segregation of schools would likely follow.

Flight from Public Schools

With advantaged students leaving poorer and weaker districts in search of stronger programs in more affluent communities, low-income students are often left behind in increasingly disadvantaged school systems. This is what Whitty (1997) referred to as the phenomena of “cream skimming.” Compounding the flight from public school systems is the fact that discriminatory practices seem to be more prevalent among private and charter schools as they were found to enroll fewer students with complicated disabilities compared to neighboring public district schools (Kane & Lauricella, 2001). Choice and competition proponents failed to acknowledge that it was government run education that accounted for bureaucratic measures that protect the rights of minorities and the poor which often fall victim of private school and charter school admission selectivity. In short, it was bureaucratic regulation, engendered by the Civil Rights Movement that gave way to desegregation, bilingual education, and education of the handicapped (Lowe, 2002).

Questionable Competitive Pressures

While charter schools have held the promise of introducing the forces of market competition there are questions as to how much pressure public schools districts feel from charter schools to change their operations. Hoxby (1996) predicated that a school

district would have to lose anywhere between 6-9 percent of its enrollments to feel competitive pressures which almost never happens. Educational reformers anticipated competitive pressures to drive public schools to act entrepreneurially by seeking innovation and responding to consumer preferences. However, public schools have been found to monolithically differentiate their services on a vertical basis by innovating administratively to help improve their position in the local market as opposed to differentiating their services on a horizontal basis by offering different curriculum options to families. This resulted in what Lubienski referred to as “second-best markets.”

Dubious Efficiency Arguments of Private Schools

While proponents of private schooling have argued that because tuition of most private schools is significantly lower than the average per-pupil spending of public schools, private schools are more efficient, studies have discovered important reasons for this. Levin (1998) found that most sectarian private schools received subsidies from the church with which they were affiliated, required students to pay for fees for extracurricular activities, held various fundraising events, and often utilized instructional clergy whose salaries understated the true market value of their services. Furthermore, most private schools keep their cost down by not providing special education or vocational training programs.

Comparison of Vouchers & Education Tax Credits

The focus of the next section of this paper will center on the ideological similarities between vouchers and education tax credits, differences between vouchers and education tax credits, and potential advantages of education tax credits over vouchers.

Similarities Between Vouchers and Education Tax Credits

Proponents of the choice and competition movement are interested in stimulating market-based reform on both the supply and demand side. On the supply side alternative schools which can be public (e.g., charter schools) or private (e.g., religious or sectarian) in theory expand educational competition among providers. On the demand side mechanisms such as vouchers and education tax credits in theory expand educational choice of consumers. In this regard, choice and competition promote privatization of choice among families and the freedom to choose while also encouraging greater expansion of private schooling.

Demand side educational reforms such as vouchers and education tax credits derive from a similar philosophical rationale. Historically, vouchers and education tax credits have been advanced as strategies to enhance the educational opportunities available to poor children in the United States (Hill, 1996). According to Lieberman, vouchers and education tax credits are widely regarded as family choice proposals and distinct forms of privatization. With vouchers and education tax credits there is an underlying property rights assumption which holds that the best way to strengthen

parental choice of schools is to strengthen parental ability to pay for education whether in a private or public school (Demsetz, 1967). Moreover, vouchers and education tax credits are viewed as vehicles to restore consumer sovereignty by enabling educational consumers (instead of producers) to control the kind and quality of services. In this regard, vouchers and education tax credits exemplify for educational consumers what Hirschman (1970) referred to as an “economic exit strategy” over the “political voice strategy” with the latter being common in the absence of competition and choice.

Differences Between Vouchers and Education Tax Credits

While vouchers and education tax credits share a similar philosophical rationale, they differ in practical application. Vouchers are typically administered by state departments of education whereas education tax credits are typically administered by state or federal agencies responsible for tax matters. With vouchers funding allocation decisions are made by government officials as opposed to donating taxpayers with education tax credits. While both voucher plans and education tax credits programs can be regulated with regard to who is eligible and the types of educational services that can be consumed, vouchers plans tend to be much more highly regulated than are education tax credit programs. In the current climate, education tax credits seem to have distinct advantages in gaining traction as a privatization mechanism over voucher plans. For a table that outlines the differences between vouchers and the education tax credits see Welner’s work.

Advantages of Education Tax Credits over Vouchers

Education tax credit programs hold potential legal, political, and policy advantages over voucher plans (Huerta & d'Entremont, 2007). The following section will review the potential legal, political, and policy advantages of tax credits over vouchers.

Legal Perspective

From the legal perspective, education tax credit programs have avoided religious entanglement issues associated with state Blaine Amendments that restrict the use of public funds for religious schools. Legal precedent has been established in the following states:

- (a). Minnesota (*Mueller v. Allen*, 1983)
- (b). Iowa (*Luthens v. Blair*, 1992)
- (c). Arizona (*Kotterman v. Killian*, 1999)
- (d). Illinois (*Griffith v. Bower*, 2001).

In the Minnesota case of *Mueller v. Allen*, the U.S. Supreme Court upheld the Minnesota education tax deduction for educational expenses including tuition for private schools. Wilson explains that the Statute was challenged as violating the federal Establishment Clause because deductions could be used for tuition paid to religious schools as well as non-religious schools. The majority opinion explained that the law allowed aid to religious schools as a result of individual decisions and not state decisions

and that the law was neutral as parents could deduct educational expenses whether children attended private or public schools. The precedent established by the *Mueller v. Allen* case that would deem indirect aid through parents rather than direct aid to religious institutions constitutionally permissible would bode well for other states that would implement education tax credit programs and be legally challenged.

In the Iowa case of *Luthens v. Blair*, a U.S. District Court ruled that the Iowa tax credit was constitutional because tax benefits flowed indirectly to parents rather than to schools. The *Luthens v. Blair* case mirrored the rationale taken by the court in the Minnesota *Mueller v. Allen* case. The Iowa tax credit program provided parents with a non-refundable tax credit up to \$100 (10% of the first \$1,000 of expenses) for private school tuition and textbook expenses. The Iowa state court upheld the tax credit program even though the state constitution contained a Blaine Amendment.

In the Arizona case of *Kotterman v. Killian*, the Arizona Supreme Court upheld the tuition tax credit program that granted tuition grant scholarships through STOs. The claimants brought suit challenging the constitutionality of the Statute on the grounds that it violated the First Amendment's requirement of separation of church and state. The court upheld by a 3 to 2 vote the constitutionality of the education tax credit law. The majority opinion maintained that a tax credit did not constitute public money because the state never gained actual possession or immediate control over the funds involved. The *Kotterman v. Killian* case once again echoed the philosophical underpinnings of the court in the Minnesota *Mueller v. Allen* case. While the claimants asked the U.S. Supreme

Court to review the decision on the grounds that it violated the Establishment Clause of the First Amendment, the court refused and let stand the state court's decision.

In the Illinois case of *Griffith v. Bower*, two different panels of the Illinois court of appeals upheld the constitutionality of the Illinois state income tax credit for private school tuition and public school educational expenses. According to School Choice Wisconsin (<http://www.schoolchoiceinfo.org/>) the claimants challenged the Statute as violating the federal Establishment Clause and the state constitution's Blaine Amendment prohibiting appropriations to religious schools as well as its language prohibiting compelled support for churches and religious institutions. The court ruled the Illinois tax credit program to be constitutional given that it was fiscally and religiously neutral since it was available to all parents of public and private school children. Moreover, the court maintained that taxes unpaid by taxpayers did not rightfully belong to the state so any such money spent on private education was not public therefore, public support did not exist. The Illinois Supreme Court declined to review the decisions of the state's lower courts.

Political Perspective

From the political perspective, education tax credit programs are not politically charged as vouchers. Debate on vouchers has been covered by the media extensively and often pit vouchers as a market-based reform against democratic notions of public schooling. As a result, vouchers are typically associated in the public's mind with efforts

to undermine public education. Vouchers are also associated with greater cost to public education as a result of increased record keeping, monitoring of students and the like (Levin and Driver, 1997). Lastly, education tax credits have not evoked the same political resistance from the school establishment (e.g., teachers unions) as with vouchers. This is largely because education tax credits are not viewed as being funded by education budgets rather drawn from general state revenues which are less of a threat to the material interests of teachers unions.

Policy Perspective

From the policy perspective, vouchers are often seen as educational policy that attempt to redistribute public resources whereas education tax credits are seen as tax policy allowing subsidies for individuals from all income levels. Put differently, tax credits are seen by the public as an opportunity for family-controlled resources whereas vouchers are seen as a reallocation of public resources to targeted groups. Tax credits also provide the most indirect path of public money to private schools which makes policy makers feel less inclined to impose state regulation on private schools that enroll tax credit beneficiaries than on voucher recipients. As such, policy makers may find tax credit programs easier to authorize and implement.

Empirical Evidence on Education Tax Credits

The following section will outline the historical evolution of education tax credits, the assumptions made by proponents of education tax credits, empirical evidence on

education tax credits in general, and existing empirical evidence on the AETC program in particular.

Historical Evolution of Tax Credits

Federal and state education tax credit proposals began to emerge late in the 1960s and 1970s, but with little success. In the 1970s, 13 states passed various education tax credit plans but only 2 had them overturned by the courts citing violations of the Establishment Clause of the Constitution (Walch, 1984). During this same time, 6 federal education tax credit proposals would pass the U.S. Senate yet fail in the House as a result on not including a K-12 provision (Augenblink & McGuire, 1982). In the 1980s the Reagan administration would propose several education tax credit programs aimed at K-12, but would be voted down by the Congress. In the 1990s the Clinton administration would pass the Tax Payer Relief Act however, this would be limited to college expenses and not K-12 expenses (Fuller, Burr, Huerta, Puryear, & Wexler, 1999). Not until 2001 would the Education IRA component be expanded to include K-12 expenses. It is important to note that the most recent federal education tax credit proposal did not include tuition, but only expenses.

At present, 40 states have proposed education tax credit programs and 7 programs are operational in Arizona, Florida, Illinois, Iowa, Minnesota, Pennsylvania, and Rhode Island (National Center for Education Statistics, 2006). The structure of education tax credit programs varies. Some states (Illinois, Iowa, and Minnesota) allow an education

tax credit to parents for their child's educational expenses. Other states (Arizona, Florida, Pennsylvania, and Rhode Island) allow a corporate tax credit for contributions to organizations that distribute student scholarships or grants to public schools. Only two states (Arizona and Iowa) allow individual tax credits for contributions to organizations that distribute scholarships or tuition grants. Only one state (Arizona) allows an individual tax credit for contributions made to public schools for extracurricular or character education programs.

Overall, education tax credit program mechanisms differ significantly in terms of the types of educational expenses that may or may not qualify (e.g., tutoring, books, computers, or tuition), if education tax credits are refundable or nonrefundable, if education tax credits can apply to private or public schools, if there is means testing for participation on the contribution side (e.g., tax bracket limits) or receipt side (e.g., percent of income below the federal poverty line), and if there are caps on the monetary amount of tax credits a state will allow annually. Given this rich variety, each of the 7 states that currently operate education tax credit programs will now be reviewed. For a table with a full description of existing tax programs currently in operation see Huerta and d'Entremont's work.

Arizona

In 1997, Arizona Revised Statute § 43-1089 was passed which allowed Arizona state income tax payers a dollar-for-dollar non-refundable tax credit for donations to

private and public schools. According to Wilson, with the private school tax credit, individuals were granted a full and direct credit against state income taxes for contributions up to \$500 (\$1,000 for joint filers) to non-profit school tuition organizations (STOs). The private school tax credit was only restricted by the following: (1) taxpayers claiming this credit could not earmark their donation to their own dependent, (2) STOs were to allocate at least 90% of their annual revenue for scholarships or grants, and (3) STOs were to provide scholarships or grants without limiting availability to only students of one school.

STOs reallocate funds in the form of grants or scholarships to be used at K-12 private schools. STOs use contributions to provide educational scholarships or tuition grants to children whose family income does not exceed 185% of the income limit required to qualify for the free/reduced meal program. According to the National Conference of State Legislatures (<http://www.ncsl.org/>) Arizona law prohibits STOs from issuing a scholarship or tuition grant in excess of \$4,200 for grades K-8 and \$5,500 for grades 9-12. Moreover, the law requires a qualified school to annually administer and make available to the public aggregate test scores on a nationally standardized norm-referenced test such as the Arizona Instrument to Measure Standards (AIMS).

With the public school tax credit, individuals were granted a full and direct credit against state income taxes for contributions up to \$200 (\$400 for joint filers) to public schools to be used for extracurricular activities that required a student fee (e.g., band uniforms, equipment for athletics, and/or science lab materials) or character education

programs that included instruction in the definition and application of specified character traits (e.g., truthfulness, responsibility, compassion, diligence and the like). In short, such activities are school sponsored in nature and require students to pay a fee to the school in order to participate. The public school tax credit was only restricted by the following: (1) nongovernmental schools, preschools, community colleges, and universities did not qualify, (2) fees were to be paid directly to a public school or district, and (3) if schools decided to establish a central fund held by the school district, then the school district would have to separately account for the funds from each school and would not be permitted to transfer funds from one public school to another.

In 2006, Arizona Revised Statute § 43-1183 was passed which allowed corporations to make donations to STOs. The law allows corporations to claim a non-refundable income tax credit for contributions made to an STO that in turn provide educational scholarships or tuition grants to children whose family income does not exceed 185% of the income limit required to qualify for the free/reduced meal program. The corporate tax credit is limited by statute to \$10 million a fiscal year, but provides that the aggregate amount of the tax credit cap from the previous fiscal year to be annually increased by 20% until 2011.

Florida

In 2001, Florida Statute § 220.187 was passed which allowed corporations to be eligible for a non-refundable income tax credit for contributions made to scholarship-

funding organizations (SFOs) which granted scholarships to low-income students. SFOs are required by law to use 100% of contributions to cover tuition, books, or transportation for children whose family does not exceed 200% of the income limit required to qualify for the free/reduced meal program. According to the National Conference of State Legislatures the amount of scholarship issued by an SFO can not exceed \$3,500 for a student enrolling in an eligible nonpublic school and \$500 for a scholarship awarded to a student enrolling in a public school outside the student's residential district. Corporations may contribute up to 75% of the amount of their tax due. Contributions are capped to \$5 million to any single SFO and there is a fiscal cap of \$88 million dollars.

Illinois

In 1999, Illinois Statute (Chapter 35, Article 2, Section 201 (m)) was passed which allowed families a non-refundable income tax credit to cover educational expenses including tuition, books, and lab or activity fees from any public, private, or parochial school. According to the People for The American Way (<http://site.pfaw.org/>) families receive a tax credit of 25% for educational expenses they incur over and above \$250, up to a maximum credit of \$500 per family. In order for families to get the maximum \$500 credit, parents would have to spend \$2,250 in educational expenses. To claim a \$100 credit, families would have to spend \$650 on qualified educational expenses. Tax credits can be claimed for any full-time student enrolled in a K-12 school that is a resident of Illinois and is under the age of 21.

Iowa

In 1987, Iowa Code § 422.12 was passed and allowed families a tax deduction up to \$1,000 spent on each dependent's elementary and secondary education expenses including tuition and textbooks, but excluding the costs of religious materials and extracurricular activities. According to the National Conference of State Legislatures families whose net income was more than \$45,000 were ineligible to receive the deduction. However, policymakers eventually eliminated the tax deduction, removed the \$45,000 ceiling, and revised the code to include a tax credit provision.

Currently there are two non-refundable income tax credit options available to families. First, the state provides a \$250 tax credit on educational expenses including private school tuition. Under this option, parents can take a 25% tax credit for educational expenses up to \$1,000 per child on state income taxes. Two, the state provides a scholarship tax credit option whereby parents can take a 65% tax credit for contributions made to school tuition organizations (STOs) which grant scholarships to low-income students to attend qualified nonpublic school of a parent's choice. STOs are required by law to use 90% of contributions for tuition grants to families with incomes below 300% of the poverty line. The Iowa Legislature in 2007 revised the scholarship tax credit by expanding the cap on income tax credits that could be distributed by STOs to a total of \$7.5 million and by allowing donors to contribute stock to STOs while also receiving the 65% income tax credit.

Minnesota

In 1955, Minnesota Statute § 290.0674 was passed and allowed families to claim a tax deduction for tuition and other school related expenses. According to the National Conference of State Legislatures the tax deduction allows parents earning more than \$37,500 to subtract from their taxable income up to \$1,625 per qualifying child for elementary school expenses and \$2,500 per qualifying child for secondary school expenses. The tax deduction covers tuition, textbooks, transportation, academic summer camps, summer school, and up to \$200 of the cost of a personal computer and education software. Parents that do not itemize on their federal income tax forms are eligible for this tax deduction.

In 1998, the Minnesota Legislature enacted a refundable tax credit that gave families a tax credit equal to 75% of the amount paid for educational related expenses for qualifying children in elementary and secondary schools. Education related expenses includes fees, textbooks, transportation, tutoring, and up to \$200 of the cost of a personal computer and education software. The tax credit does not cover the cost of tuition. The tax credit is worth \$1,000 per student and \$2,000 per families whose income is below \$37,500. No tax credit is available for families whose income is greater than \$37,500. Minnesota's income tax features both an education tax deduction and tax credit programs. While the tax deduction lowers taxable income the tax credit reduces state income tax liability or increases a taxpayer's refund.

Pennsylvania

In 2001, 24 Pennsylvania Code § 20-2002-B was passed which allowed corporations to be eligible for a non-refundable income tax credit for contributions made to scholarship organizations or education improvement organizations (EIOs) in public schools. According to the National Conference of State Legislatures scholarship organizations must contribute at least 80% of their annual receipts for distribution in the form of scholarships to public or non-public school children to attend a school of their choice. EIOs must distribute at least 80% of their annual receipts as grants to public schools for innovative educational programs (e.g., art or technology).

An income tax credit is available for 75% of a corporation's contribution up to \$100,000 or 90% of its contributions if a corporation contributes for more than one year. In 2006, the Pennsylvania General Assembly expanded the tax credit program to allow corporations to donate up to \$54 million annually to scholarship organizations (\$18 million) and education improvement organizations (\$36 million). According to School Choice Wisconsin tax credits are awarded to participating corporations on a first come, first served basis until the cap is reached.

Rhode Island

In 2006, Rhode Island Statute § 44-62-2 was passed which allowed corporations to be eligible for a non-refundable income tax credit for contributions made to scholarship organizations that provide tuition assistance grants to low-income students.

According to the National Conference of State Legislatures qualified families household income can not be more than 250% of the federal poverty limit. Corporations are eligible to contribute up to \$100,000 to a scholarship organization annually. Contributions are made on a first come, first served basis and the total amount of tax credits shall not exceed \$1 million in a fiscal year.

Overall, tax credits allow individuals, families, or businesses to spend money on educational services and allow parties to offset all or a portion of that expenditure against their tax liability. Tax credits not unlike other market-based educational reforms are predicated on a number of economic assumptions which will be discussed in the following section.

Assumptions Made by Proponents of Education Tax Credits

Four assumptions made by proponents of education tax credits will now be taken up. One, it is assumed that education tax credits will reduce the price of private education services and thereby encourage private demand and consumption, and ultimately switch students from public to private schools. In this regard, education tax credits serve as a mechanism to create private markets in education (Godwin & Kemerer, 2002). Two, it is assumed that education tax credit programs will stimulate the supply of private education services and generate competition among educational providers since individuals are not expected to give (via their tax credits) should a worthwhile supply not exist (Belfield, 2001). Three, it is assumed that education tax credits will not effect

general education budgets or result in a net cost to the government (Coulson, 2004).

Four, it is assumed that families of all income levels will equally partake in education tax credit programs (Lips & Jacoby, 2001).

Empirical Evidence on Education Tax Credits

All four of these assumptions associated with education tax credits can be framed into the following research questions to help determine the impact of such a market-based reform:

1. How do education tax credits impact the elasticity of demand for private schooling?
2. Do education tax credits impact the elasticity of supply of private schooling?
3. Do education tax credits result in a net cost to government?
4. How do education tax credits promote equity among educational consumers?

A comprehensive review of the literature greatly informs these questions, but it should be noted that while there has been some research on the equity and costs of education tax credits, research on the elasticity of the demand and supply-side of education tax credits has been sparse. Even so, interest in education tax credits has

continued to grow and outpace research on the effects of this latest market-based reform. Each research question will now be answered by the existing literature.

Elasticity of Demand for Private Schooling?

There is an assumption that education tax credits impact the elasticity of demand for private schooling by providing sufficient monetary incentives for families to consume educational services and more specifically, encourage educational consumers to switch from public to private schools. So, the research question is: how do education tax credits impact the elasticity of demand for private schooling? Current education tax credit programs do not appear to offer tax credits large enough to compel educational consumers in public schools to switch to private schools (Chiswick & Koutroumanes, 1996). If the amount of education tax credits were increased, projections suggest that private schools would simply raise their tuition and it would be families already in private education that would benefit (Catterall & Levin, 1982).

Elasticity of Supply for Private Schooling?

There is an assumption that education tax credits impact the elasticity of supply of private schooling by private schools increasing their capacity in response to increased demand. So, the research question is: do education tax credits impact the elasticity of supply of private schooling? The limited evidence on the elasticity of supply of private schooling suggests it is very low (Belfield & Levin, 2001a). What seems more likely is that private schools will not increase their capacity, but rather increase their tuition in

response to education tax credits. Whether private schools have the capacity (e.g., seats, teachers, facilities and the like) to increase their supply may not be the most important consideration. Independent of fiscal issues, private schools might decide to not increase capacity based on self-imposed policies concerning growth and the overall mission of the school (Belfield & Levin, 2001b).

Net Cost to Government?

Studies have been undertaken to project the impact of education tax credits on state revenues. So, the research question is: do education tax credits result in a net cost to government? At the federal level, with an education tax credit of \$500, Frey (1983) projected a net loss in revenue of \$0.77 billion, Olsen, Lips, and Lips (2001) projected a net loss in revenue of \$0.62 billion, and Longanecker (1983) predicted a net loss of \$1 billion. Overall, for the net cost to the government, the literature would point to a reduction in government revenues as a result of education tax credit programs. According to Huerta and d'Entremont, while education budgets may not be directly affected by education tax credits, all state programs may have to compete for limited state resources that are drawn from state treasuries.

Promotion of Equity Among Educational Consumers?

It is assumed that families of all income levels will equally partake in education tax credit programs. So, the research question is: to what extent do education tax credits promote equity among educational consumers? To determine if education tax credits are

equitable the analytic tool of target efficiency has been utilized. Ultimately, target efficiency helps to determine if education tax credits result in a transfer in resources to intended beneficiaries as opposed to gains to those already enrolled in private schools. The following research findings are based on projections of proposed federal education tax credit programs. Frey (1991) estimated the target efficiency of those that would switch to private schools as a result of education tax credits to be 12-13%. West (1985) and Olsen et al. found a similar target efficiency at no more than 15%. Longanecker estimated that 60% of benefits derived from education tax credits going to families above the median income. The literature would suggest that since low-income families do not pay net taxes, benefits of education tax credits tend to go to those of high-income and serve as a tax loophole for those that already send their children to private schools (Catterall, 1983). Attention will now be dedicated to how these research findings apply to the AETC program.

Empirical Evidence on the AETC Program

The broad research findings on the elasticity of demand and supply as a result of education tax credits and the costs to government and the distribution of benefits have been generally consistent with the limited research findings on the Arizona Education Tax Credit (AETC) program. Wilson (2000, 2002) examined the initial impact of the AETC program in the first three years of the program (1998-2000) by specifically addressing the elasticity of demand and supply as a result of the AETC, costs to the government, and distribution of benefits. A point of clarification, rather than examine the

elasticity of supply of private schools, Wilson examined the supply of Student Tuition Organizations (STOs) which disbursed scholarships funded by the private school education tax credit. Wilson's research findings will now be taken up.

Elasticity of Demand for Private Schooling with the AETC Program?

With regard to the elasticity of demand for private schooling with the AETC, Wilson found that only 2.1 percent of lower-income families were able to move their children from public to private schools as a result of the private school tuition tax credit program. While the economic assumption of price effect would suggest that reduced price of private schooling would increase demand, there are other barriers beyond the cost of private schooling that might preclude lower-income families from switching from private to public schools. Additional barriers include added costs associated with various supplies needed for schooling not provided by private schools, transportation costs, and selectivity of admissions.

Elasticity of Supply for Private Schooling with the AETC Program?

As noted earlier, rather than specifically examine the elasticity of supply of private schools, Wilson examined the supply of Student Tuition Organizations (STOs) that emerged following the passage of the AETC program. STOs were responsible for disbursing scholarships funded by the private school education tax credit. In the first three years of the AETC program, there were 15 STOs (predominately religiously

affiliated) that solicited and received \$1.8 million in donations for private school scholarships from 4,246 donors.

Wilson hypothesized that the low scholarship award amounts served as evidence that the private school tax credit was functioning more as a middle class subsidy rather than offering increased access to lower-income families in the state. Moreover, while the AETC private school tax credit prohibits taxpayers from claiming their dependents, taxpayers are permitted to designate their tax credit funds for a specific student. This has resulted in the practice of “cross-designation” where families designate their tax credits for an acquaintance’s child with the understanding that the acquaintance will reciprocate.

Net Cost to Government as a Result of the AETC Program?

The cost of the AETC program to the state of Arizona was found to be been significant. Wilson calculated that the combined private and public school education tax credit for the first three years of the program (1998-2000) cost the state of Arizona \$74.3 million. In each of the first three years with both the private and public education tax credit, the amount of tax dollar donations steadily increased. The AETC program resulted in a loss of tax revenue. Diverting tax revenue away from the state treasury results in fewer resources the state can draw upon for other public provisions. Put differently, while the AETC program may generate revenues for private and public schools it diminishes the ability of the state to provide other much needed public provisions.

Beneficiaries of the AETC Program?

In terms of the beneficiaries of the AETC private school tuition tax credit program, Wilson's findings would suggest an inequitable distribution. Families earning above \$50,000 took 84.1 percent of the private school tuition tax credits whereas families earning below \$50,000 took only 19.2 percent of private school tuition tax credits. The findings were consistent with Wilson's findings with the AETC public school tax credit and would suggest again an inequitable distribution. Families earning above \$50,000 took 76.1 percent of the public school tax credit whereas families earning below \$50,000 took only 23.9 percent of the public school tax credit. These findings would suggest that with the AETC private and public tax credit, higher-income families were much more inclined to claim tax credits than lower-income families raising serious questions about the equity and access.

To be sure, Wilson's research on the AETC program is the most current and comprehensive. Nonetheless, Wilson's research was done on the first three year's of the AETC program (1998-2000) and there has been no follow up study since. Wilson's research was comprehensive and included both the private and public school education tax credit programs, yet no study has since focused exclusively on the public education tax credit program despite its meteoric growth over the past decade. This study will follow the empirical inquiry pursued by previous scholars and make a timely contribution to the literature by quantitatively determining if the public education tax credit program in Arizona has resulted in an equitable distribution funds. Attention will now be turned to the methodology that will be utilized in this study.

CHAPTER 3

METHODOLOGY

This chapter explains the methods used in this study. Emphasis will be placed on the research perspective, unit of analysis, collection of data, description of data, preparation of data, and the test and measure of data.

Research Perspective

This dissertation quantitatively examined the relationship between per pupil education tax credit revenues and the percentage of students eligible for the free/reduced meal program among 92 unified public school districts using correlation and regression analysis for the years 2005, 2006, and 2007. By statistically examining the distribution of per pupil education tax credit revenues in terms of student poverty/wealth among unified public school districts in a time-series manner, the study aimed to determine if the public education tax credit program in Arizona had resulted in an equitable distribution funds.

As such, the following research questions guided this study:

1. What is the relationship between per pupil education tax credit revenues and the percentage of students eligible for the free/reduced meal program?
2. To what extent can the relationship between these two variables be predicted and how reliable is the linear relationship?
3. Do education tax credits improve equity?

Unit of Analysis

The unit of analysis for this study was 92 unified school districts ($N = 92$). For a list of all 92 unified school districts used in the study and unified school districts excluded see Table 1.

Table 1

92 Unified School Districts

Ajo	Fountain Hills	Mayer	Santa Cruz Valley
Amphitheater	Fredonia-Moccasin	Mesa	Scottsdale
Apache Junction	Ft Thomas	Miami	Sedona-Oak Creek Joint
Ash Fork Joint	Ganado	Morenci	Seligman
Benson	Gila Bend	Nogales	Show Low
Bisbee	Gilbert	Page	Sierra Vista
Blue Ridge	Globe	Paradise Valley	Snowflake
Camp Verde	Grand Canyon	Parker	St David
Cave Creek	Hayden-Winkelman	Payson	St Johns
Cedar	Heber-Overgaard	Peach Springs	Sunnyside
Chandler	Higley	Peoria	Superior
Chinle	Holbrook	Pima	Tanque Verde
Chino Valley	Humboldt	Pinon	Thatcher
Clifton	Indian Oasis-Baboquivari	Queen Creek	Tombstone
Colorado City	J O Combs	Ray	Tuba City
Coolidge	Joseph City	Red Mesa	Tucson
Deer Valley	Kayenta	Round Valley	Vail
Douglas	Kingman	Saddle Mountain	Whiteriver
Duncan	Lake Havasu	Safford	Wickenburg
Dysart	Littlefield	Sahuarita	Willcox
Flagstaff	Mammoth-San Manuel	San Carlos	Williams
Florence	Marana	San Simon	Window Rock
Flowing Wells	Maricopa	Sanders	Winslow

Note. While there are 97 active and fundable unified school districts in Arizona, 5 unified school districts were not included in the study for either lacking essential data or as a result of being an outlier. Baghdad, Bowie, and Catalina Foothills Unified School Districts lacked free/reduced meal program claim data whereas Nadaburg and Prescott Unified School Districts were 10 standard deviations from the mean. As a result, these 5 unified school districts were not included in the study.

The rationale for selecting unified school districts as the unit of analysis was to enhance comparability and to acquire a large sample size that would be reflective of the socio-economic diversity in the state. Unified school districts typically embody K-12 schools however, public districts often do not and charter schools are just that, standalone schools with a charter status. As such, a comparison between public districts and charters to unified school districts would prove difficult. Therefore, public districts and charters were excluded from this study. A large sample size was acquired as a result of selecting unified school districts as the unit of analysis. In fact, the study's unit of analysis captured roughly half the schools and students within the state. Moreover, as the X variable would illustrate in the visual scatter plots and descriptive statistics on the mean and standard deviation on the X variable would indicate later in the study, the unit of analysis did represent broad socio-economic diversity found within the state in general and unified public school districts in particular. To see a comparison between the unit of analysis and the overall state see Table 2.

Table 2

Unit of Analysis compared to the State of Arizona

	Unit of Analysis	State of Arizona
School Districts	92 unified school districts	618 school districts & charters
Schools	831 schools	1,626 schools
Students	593,136 students	1,180,579 students

Note. The number of school districts in the State of Arizona was obtained from the National Center for Educational Statistics whereas the number of schools and students was obtained from the National School Lunch Program & School Breakfast Program.

Collection of Data

The method for collection of data in this study was unobtrusive. Webb, Campbell, Schwartz, and Sechrest (1966) described unobtrusive measures as “invisible” and “nonreactive.” Unobtrusive measures are “invisible” since such measures do not interfere in the ongoing flow of everyday events. Unobtrusive measures are “nonreactive” in nature as the researcher does not require the cooperation of subjects. Data collected in an unobtrusive manner have various categories including archival records (Marshall and Rossman, 1999). It should be noted that virtually any running record provides an “archive” per se. Denizen (1978) divided archival records into two types: private and public. Public archival records are often prepared by government agencies for the expressed purposes of examination by others (Berg, 2004). Such data are typically straightforward statistical analysis and/or reports in standard formats in print and

electronic forms. The two data sets that were used for this study derived from public archival records. The data sets were collected on-line from the Arizona Department of Education and the Arizona Department of Revenue websites.

Description of Data

The two data sets that were used in this study constitute public archival records. The Arizona Department of Education data related to the percentage of students eligible for the free/reduced meal program whereas the Arizona Department of Revenue data related to the per student education tax credit revenues received. Both data sets will now be described in greater detail.

Arizona Department of Education Data

The Arizona Department of Education collects and publishes claim data on-line on their website for the National School Lunch Program & School Breakfast Program. This federal program is also known as the free/reduced meal program. According to Katrina Klatt, Program Director of the National School Lunch Program & School Breakfast Program with the Arizona Department of Education, in order for children to receive a free meal that family must earn an income that is 185% of the federal poverty level whereas for children to receive a reduced meal that family must earn an income that is 130% of the federal poverty level (K. Klatt, personal communication, April 18, 2008).

The free/reduced meal program claim data for 2005, 2006, and 2007 is available on-line in a portable document format (PDF) and Excel format through the Arizona

Department of Education website. The free/reduced meal program claim data is presented in one table by individual school. For example, individual school claim data are presented in table format listing the number of children that are eligible for the free meal program, reduced meal program, paid eligible, total eligible, and the total free/reduced percentage. Given that the free/reduced meal program claim data is available in an Excel format, modifying the data to accommodate the unit of analysis for this study will be possible.

Arizona Department of Revenue Data

Arizona Revised Statute § 43-1089 allows a non-refundable credit up to \$400 (joint filers) for fees or cash contributions paid to public school (including charter schools) for extracurricular activities or character education programs. Public schools are required to file by no later than February 28th a report to the Arizona Department of Revenue each year disclosing the following data: (1) the number of donors, (2) total donor contributions and/or fees paid, and (3) the amount of contributions and/or fees spent. The Arizona Department of Revenue gathers and publishes data from the AETC program for the private school tax credit, public school tax credit, and the corporate tax credit.

The public school tax credit data for 2005, 2006, and 2007 is available on-line in a portable document format (PDF) through the Arizona Department of Revenue website. The public school tax credit data is presented in various and broad tables. For example, aggregate data by county and school districts are presented in table format listing the

number of donors and dollars received. The most detailed level of data provided is at the district level and lists the number of donors, contributions/fees received, and contributions/fees spent in a given year.

While the Arizona Department of Revenue does provide public school tax credit data on-line in a PDF format, it would be difficult to modify the data in this format. In order to sort and modify the public school tax credit data for unified public school districts for 2005, 2006, and 2007, the data will need to be in an Excel format. As a result, Jorge Frank with the Arizona Department of Revenue, Office of Economic Research and Analysis was contacted and asked if the public school tax credit data for all years of interest could be sent to me via e-mail in an Excel format which he cordially agreed to do (J. Frank, personal communication, March 10, 2008).

Preparation of Data

For this study it was necessary to prepare mass raw data sets from the Arizona Department of Education and the Arizona Department of Revenue for test and measure by minimizing, modifying, and merging the data.

Minimization of Data

Both data sets of interest included various data for all school districts and individual schools in Arizona. The free/reduced meal program claim data and public school tax credit data therefore needed to be minimized and some additional claim data eliminated for all unified school districts in the state to accommodate the design of the

study. Arizona Department of Education claim data for the free/reduced meal program was minimized to meet the study's unit of analysis ($N = 92$). All district claim data listing the number of children that were eligible for the free meal program, reduced meal program, paid eligible, total eligible, and the total free/reduced percentage were retained. Arizona Department of Revenue claim data for the public school tax credit program were minimized to meet the study's unit of analysis in the state as well. Only district claim data listing contributions/fees received were retained. All district claim data listing the number of donors and contributions/fees spent in a given year were eliminated. While claim data listing the number of donors and contributions/fees spent in a given year was valuable and illuminating, the data was not used in the testing and measurement of the study.

Modification of Data

With both data sets minimized to the unified school districts of interest, data for both measures was then modified to allow for the merger of data. Arizona Department of Education claim data was modified to yield the mean percentage of students eligible for the free/reduced meal program for each unified school district. This calculation was done independently for 2005, 2006, and 2007, in addition to an aggregate mean calculation for all three years. Arizona Department of Revenue claim data was modified to yield the per pupil education tax credit revenue for each unified school district. This figure was arrived at by (1) taking the mean contributions/fees received by each unified school district and (2) by dividing that revenue amount by each unified school district's mean student

enrollment. The student enrollment for each unified school district was provided in the Arizona Department of Education claim data of students eligible for the free/reduced meal program under the “total eligible” category. This calculation was done independently for 2005, 2006, and 2007, in addition to an aggregate mean calculation for all three years.

Merging of Data

With both data sets minimized and modified to the unified school districts of interest, both data sets were then merged for test and measurement. The merger of both modified data sets yielded four tables for 2005, 2006, 2007, and an aggregate for all three years. A full list of tabled values for each year can be seen in Appendix A (2005), Appendix D (2006), Appendix G (2007), and Appendix J (Aggregate). Each table lists the 92 unified school districts in alpha order and provides each unified school district’s mean percentage of students eligible for the free/reduced meal program (represented as the *X* variable) and per pupil education tax credit revenue (represented as the *Y* variable). Tabled values for the *X* and *Y* variables were necessary to statistically test and measure the data using correlation and regression analysis.

Test and Measure of Data

The following section will review the statistical concepts of correlation and regression that were used to test and measure the variables of this study, explain the

procedures that were used in the correlation and regression analysis, and describe how the results will be presented.

Review of Statistical Concepts

Correlation and regression are related as they both involve the relationship between two or more variables and utilize the same set of data. In short, correlation determines the direction and degree of the relationship between variables whereas regression involves using the relationship for prediction (Pagano, 2004). Both correlation and regression will now be reviewed in greater detail.

Correlation

According to Pagano, correlation determines if the direction of relationship between two variables is positive or negative. If the relationship is positive, the slope of the line runs upward from left to right. In this instance, as X increases, Y increases and there is said to be a direct relationship between the two variables. If the relationship is negative, the slope of the line runs downward from left to right. In this instance, as X increases, Y decreases and there is said to be an inverse relationship between the two variables.

Correlation also determines the degree of relationship between two variables which is expressed by the correlation coefficient. When there is a linear relationship between variables and data are measured in intervals as with this study, it is best to adopt the Pearson r correlation coefficient (Kachigan, 1986). The Pearson r correlation

coefficient can vary from +1 to -1. The sign of the Pearson r correlation coefficient indicates if the direction of the relationship is positive or negative whereas the numerical part of the Pearson r correlation coefficient indicates the degree of correlation. A Pearson r correlation coefficient of +1 indicates that the correlation is positive and perfect whereas a Pearson r correlation coefficient of -1 indicates that the correlation is negative and perfect. In the event a Pearson r correlation coefficient is 0 a relationship between variables is said to be nonexistent. Perfect relationships between variables are rare so imperfect relationships have Pearson r correlation coefficients ranging in degree between 0 and 1.

Regression

Pagano notes that when imperfect relationships between variables are displayed on a scatter plot and a linear pattern emerges, but not all points fall on a straight line, a straight line can be drawn that most accurately fits data. In such a case, the best-fitting line that is used for prediction is referred to as a regression line. The main goal of linear regression is to model the relationship between two variables and fit a straight line through the data that predicts Y based on X .

A linear regression line has an equation of the form $Y = \beta x + \alpha$. In this equation, the regression parameter β or beta weight represents the slope of the line and the regression parameter α or alpha weight represents the intercept on the Y axis. Given that a straight line won't fit the data exactly, there will be an error at each data point. To find an

optimal intercept and slope that minimizes the total errors for prediction, an ordinary least-squares (OLS) criterion is used to construct a regression line (Neter, Kutner, Nachtsheim, & Wasserman, 1996). The OLS regression line gives the greatest overall accuracy in predicting Y values from X values. According to Abrami, Cholmsky, and Gordon (2001) to measure the reliability of the linear relationship between the X and Y values, an R-squared (R^2) value is used which is the square of the Pearson r correlation coefficient. An R^2 value close to 1 indicates an excellent linear reliability.

Procedures for Correlation and Regression Analysis

Correlation and OLS regression analysis of data was done using Microsoft Office Excel 2007 software, specifically the Analysis ToolPak add-in. This computer based statistical software computed and generated a variety of outputs that yielded: (1) descriptive data on the X and Y variables, (2) a Pearson r correlation coefficient, (3) an OLS regression line equation, (4) R^2 value, and (5) analysis of variance (ANOVA) data.

With tabled values for the X and Y variables for unified school districts, correlation and OLS regression analysis followed with the development of a series of scatter plot and linear model graphs using Microsoft Office software that pictorially displayed data for all years of interest. Each scatter plot and linear model graph included a Y vertical axis and an X horizontal axis. The intersection of the two axes was set at zero for both scales. The most suitable units for plotting values for the Y axis were \$50.00 intervals and included a range from \$0.00 to \$250.00. The units for plotting values for the

X axis were in intervals of 10% and included a range from 0.00% to 100.00%. The development of scatter plot and linear model graphs were expected to answer the research questions that guided this study in the following manner.

Research Question 1

What is the relationship between per pupil education tax credit revenues and the percentage of students eligible for the free/reduced meal program?

By plotting graphs with paired X and Y values, the scatter plots were expected to reveal if the direction of the relationship between the X and Y variables was positively or negatively associated. While scatter plots may indicate the direction of relationship between variables, the degree of relationship can only be determined through linear modeling. As such, linear modeling generated the Pearson r correlation coefficient to ascertain the degree of relationship between the X and Y variables.

Research Question 2

To what extent can the relationship between these two variables be predicted and how reliable is the linear relationship?

Given that it was unlikely that all plotted points will fall on a straight line, an OLS regression line was modeled to determine the optimal slope and Y intercept that minimized the total errors for the prediction of Y given X . In addition, the Pearson r correlation coefficient was squared to measure the reliability of the linear relationship

between the X and Y values. Put differently, the R^2 measured the proportion of the total variability of Y that is accounted for or explained by X .

Research Question 3

Do education tax credits improve equity?

Statistical outputs from the correlation and OLS regression analysis would yield data on the Pearson r correlation coefficient, the OLS regression line, and the R^2 value, but also analysis of variance (ANOVA) data. By combining the statistical outputs of the Pearson r correlation coefficient, the beta weight from the OLS regression model, and ANOVA data on significance and probability, the study was expected to determine if the public education tax credit program in Arizona had resulted in an equitable distribution funds.

Presentation of Results

These statistical outputs will be presented for 2005, 2006, and 2007, in addition to an aggregate output for all three years. For example, for each year and for the aggregate of all three years, descriptive data on the X and Y variables will be provided such as their mean values and their standard deviation, a scatter plot, an OLS regression line with pertinent equations and R^2 values, and ANOVA data. These results will be presented in a pictorial manner with a variety of tables and figures. Large data sets such as tabled values for the X and Y variables for all years of interest used to generate the correlation and OLS

regression analysis and statistical results have been provided in the Appendix. Attention will now be turned to the presentation of results.

CHAPTER 4

PRESENTATION OF RESULTS

The purpose of this study was to statistically examine the distribution of per pupil education tax credit revenues in terms of student poverty/wealth among unified public school districts in a time-series manner to determine if the public education tax credit program in Arizona had resulted in an equitable distribution funds. As such, this chapter is organized in terms of asking each research question and presenting the results for 2005, 2006, and 2007, in addition to an aggregate output for all three years. Results for each year of interest will include descriptive data on the X and Y variables such as their mean values and their standard deviation, a scatter plot, an OLS regression line with pertinent equations and R^2 values, and ANOVA data on significance and probability.

2005 Results

Research Question 1

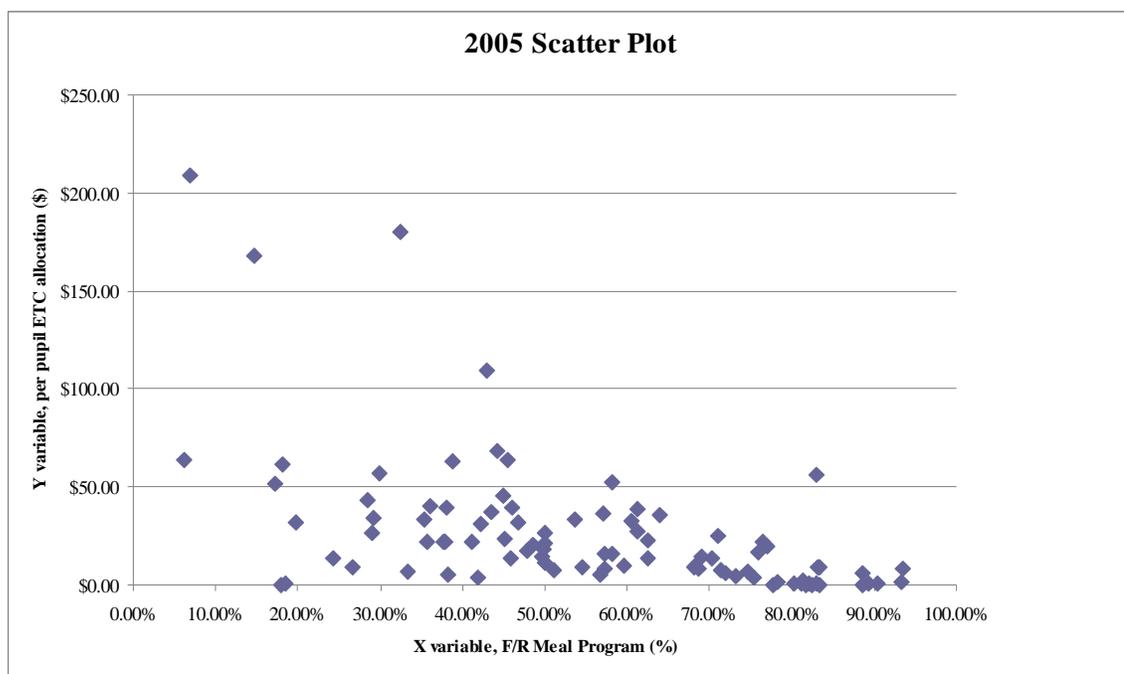
What is the relationship between per pupil education tax credit revenues and the percentage of students eligible for the free/reduced meal program?

Statistical software generated values for the X variable ($M = 55.17\%$, $SD = 22.04\%$) and Y variable ($M = \$26.70$, $SD = \$35.76$). See Appendix B for a full view of 2005 descriptive statistics. When the X and Y variables were plotted on a graph the direction of relationship between the variables emerged. The slope of the line ran

downward from left to right suggesting a negative association. In short, as the X value increased, the Y value decreased (see Figure 1).

Figure 1

2005 Scatter Plot



The negative association between variables was reinforced by the Pearson r correlation coefficient ($r = -.52, p < .001$) which proved statistically significant.

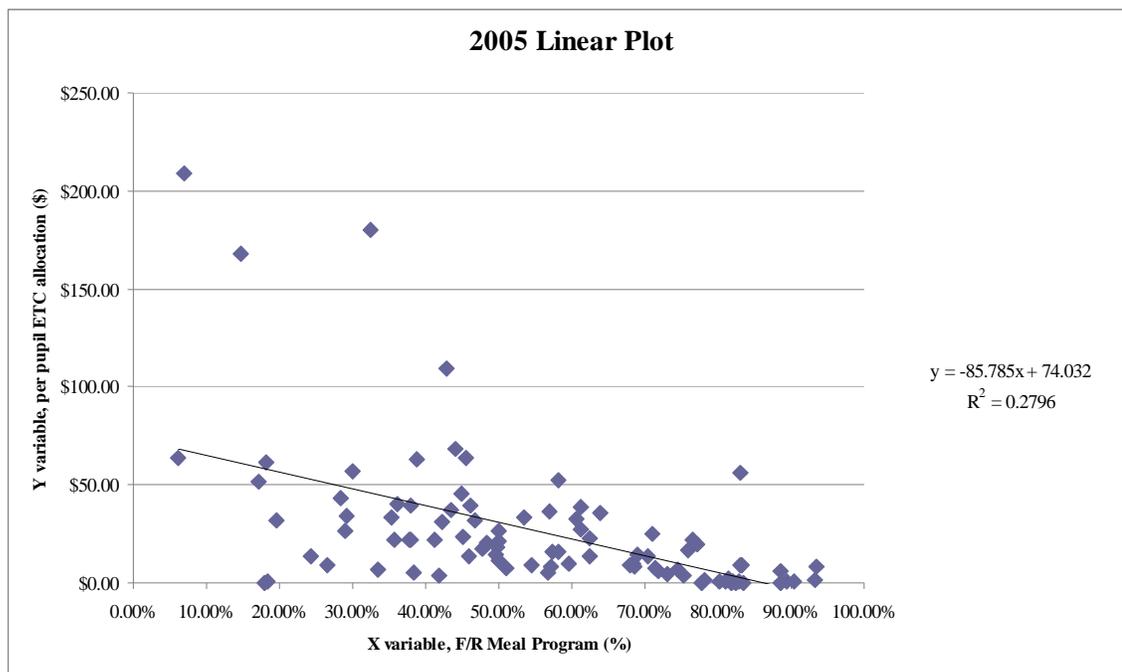
Research Question 2

To what extent can the relationship between these two variables be predicted and how reliable is the linear relationship?

Not all data points fell on a straight line based on the results of the scatter plot as seen in Figure 1. As such, an OLS regression model was generated which yielded a best-fit line (see Figure 2).

Figure 2

2005 Linear Plot



The OLS regression model generated values for the slope ($b = -85.784x$) and intercept ($a = 74.032$) and allowing for prediction of Y given X . To measure the reliability of the linear relationship between the X and Y values an R^2 value was generated (.27) suggesting that 27% of the variability in the Y variable could be explained by the X variable.

Research Question 3

Do education tax credits improve equity?

Combining the statistical outputs from the correlation, OLS regression analysis, and including ANOVA data on significance and probability provided the best fit between the X and Y variables: $r = -.52$, $R^2 = .27$, Adjusted $R^2 = .27$, $F(1,90) = 34.93$, $p < .001$. The beta weight was negative suggesting that unified school districts with higher percentages of students eligible for the free/reduced meal program received lower per pupil education tax credit revenues. See Appendix C for a full view of 2005 regression and ANOVA statistics.

2006 Results

Research Question 1

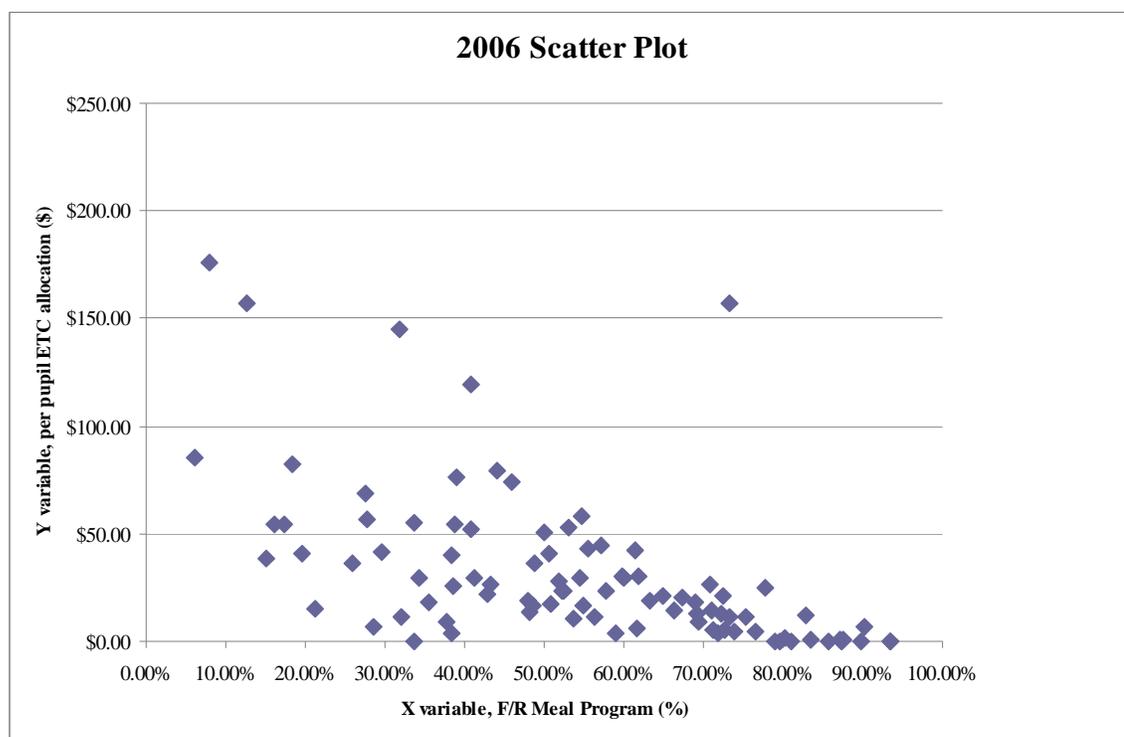
What is the relationship between per pupil education tax credit revenues and the percentage of students eligible for the free/reduced meal program?

Statistical software generated values for the X variable ($M = 54.23\%$, $SD = 21.80\%$) and Y variable ($M = \$31.80$, $SD = \$36.10$). See Appendix E for a full view of

2006 descriptive statistics. When the X and Y variables were plotted on a graph the direction of relationship between the variables clearly emerged. The slope of the line ran downward from left to right suggesting a negative association. Put differently, as the X value increased, the Y value decreased (see Figure 3).

Figure 3

2006 Scatter Plot



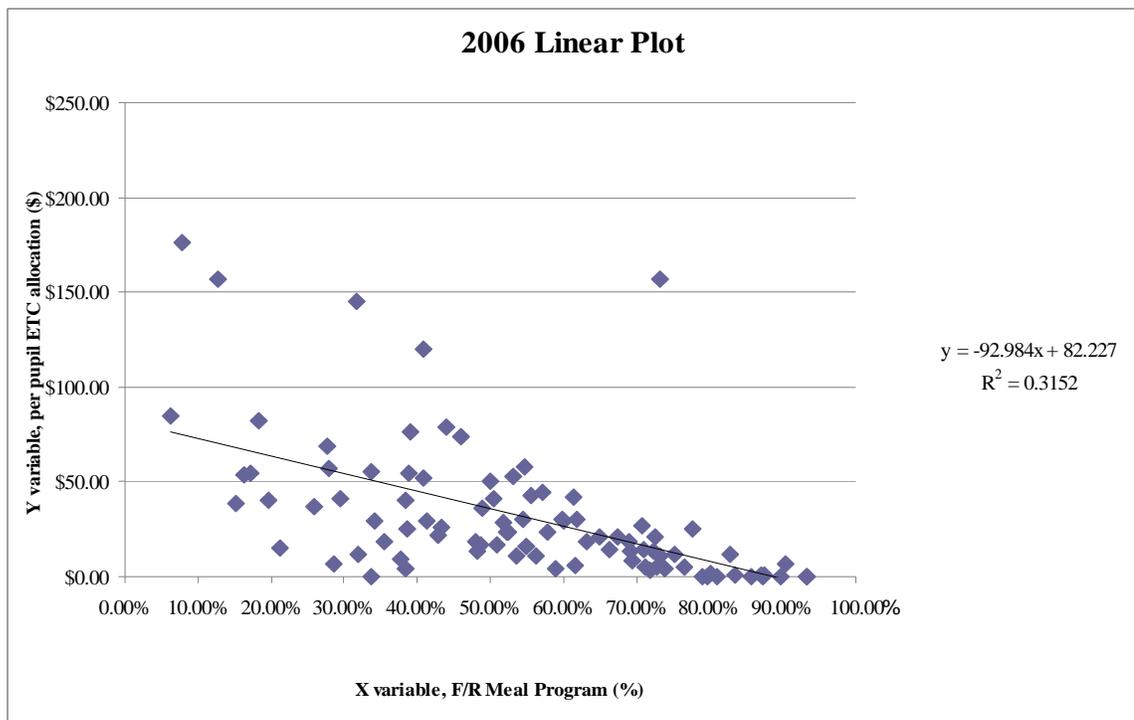
The negative association between variables was reinforced by the Pearson r correlation coefficient ($r = -.56, p < .001$) which proved statistically significant.

Research Question 2

To what extent can the relationship between these two variables be predicted and how reliable is the linear relationship?

Not all data points fell on a straight line based on the results of the scatter plot as seen in Figure 3. As such, an OLS regression model was generated which yielded a best-fit line (see Figure 4).

Figure 4

2006 Linear Plot

The OLS regression model generated values for the slope ($b = -92.984x$) and intercept ($a = 82.227$) and allowing for prediction of Y given X . To measure the reliability of the linear relationship between the X and Y values an R^2 value was generated (.31) suggesting that 31% of the variability in the Y variable could be explained by the X variable.

Research Question 3

Do education tax credits improve equity?

Combining the statistical outputs from the correlation, OLS regression analysis, and including ANOVA data on significance and probability provided the best fit between the X and Y variables: $r = -.56$, $R^2 = .31$, Adjusted $R^2 = .30$, $F(1,90) = 41.43$, $p < .001$. The beta weight was negative suggesting that unified school districts with higher percentages of students eligible for the free/reduced meal program received lower per pupil education tax credit revenues. See Appendix F for a full view of 2006 regression and ANOVA statistics.

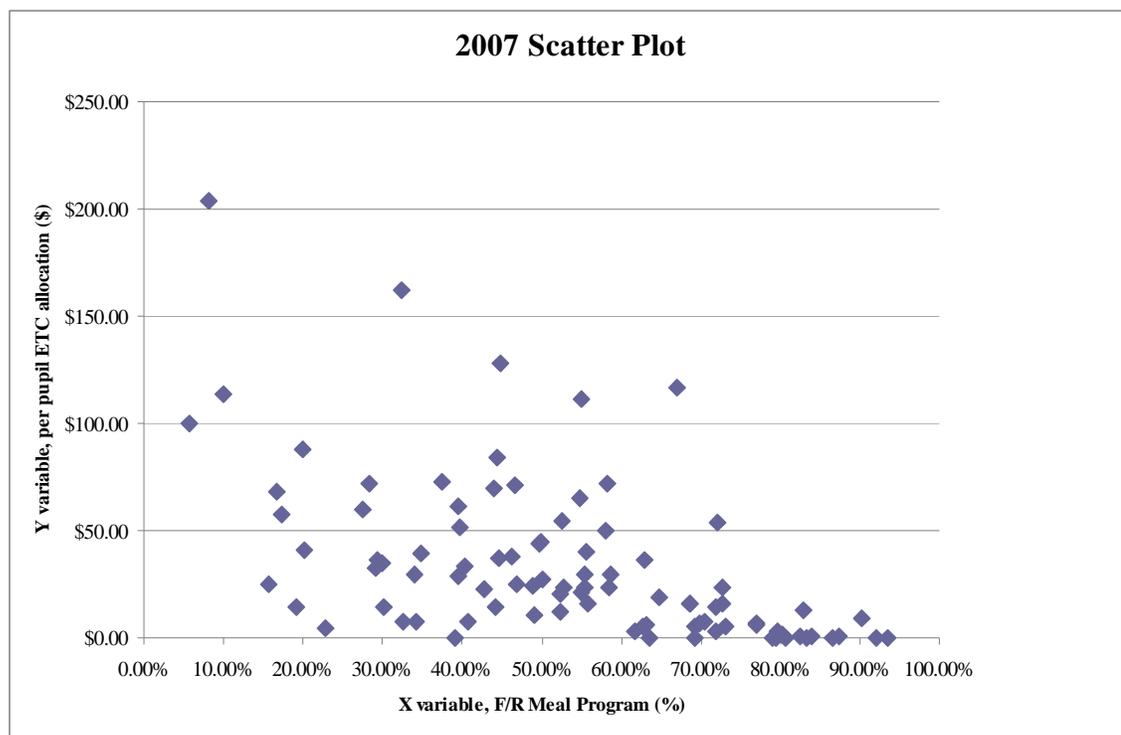
2007 Results

Research Question 1

What is the relationship between per pupil education tax credit revenues and the percentage of students eligible for the free/reduced meal program?

Statistical software generated values for the X variable ($M = 53.13\%$, $SD = 21.40\%$) and Y variable ($M = \$33.65$, $SD = \$37.84$). See Appendix H for a full view of 2007 descriptive statistics. When the X and Y variables were plotted on a graph the direction of relationship between the variables clearly emerged. The slope of the line ran downward from left to right suggesting a negative association. Put differently, as the X value increased, the Y value decreased (see Figure 5).

Figure 5

2007 Scatter Plot

The negative association between variables was reinforced by the Pearson r correlation coefficient ($r = -.54, p < .001$) which proved statistically significant.

Research Question 2

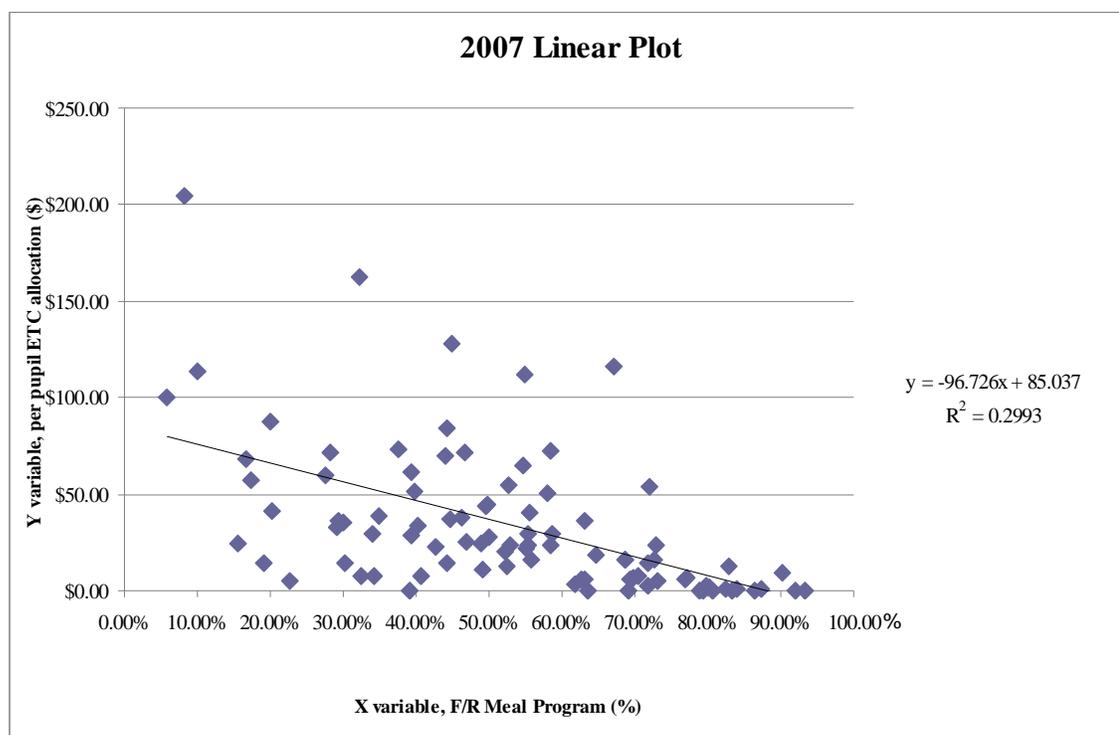
To what extent can the relationship between these two variables be predicted and

how reliable is the linear relationship?

Not all data points fell on a straight line based on the results of the scatter plot as seen in Figure 5. As such, an OLS regression model was generated which yielded a best-fit line (see Figure 6).

Figure 6

2007 Linear Plot



The OLS regression model generated values for the slope ($b = -96.726x$) and intercept ($a = 85.037$) and allowing for prediction of Y given X . To measure the reliability of the linear relationship between the X and Y values an R^2 value was generated (.29) suggesting that 29% of the variability in the Y variable could be explained by the X variable.

Research Question 3

Do education tax credits improve equity?

Combining the statistical outputs from the correlation, OLS regression analysis, and including ANOVA data on significance and probability provided the best fit between the X and Y variables: $r = -.54$, $R^2 = .29$, Adjusted $R^2 = .29$, $F(1,90) = 38.44$, $p < .001$. The beta weight was negative suggesting that unified school districts with higher percentages of students eligible for the free/reduced meal program received lower per pupil education tax credit revenues. See Appendix I for a full view of 2007 regression and ANOVA statistics.

Aggregate Results

Research Question 1

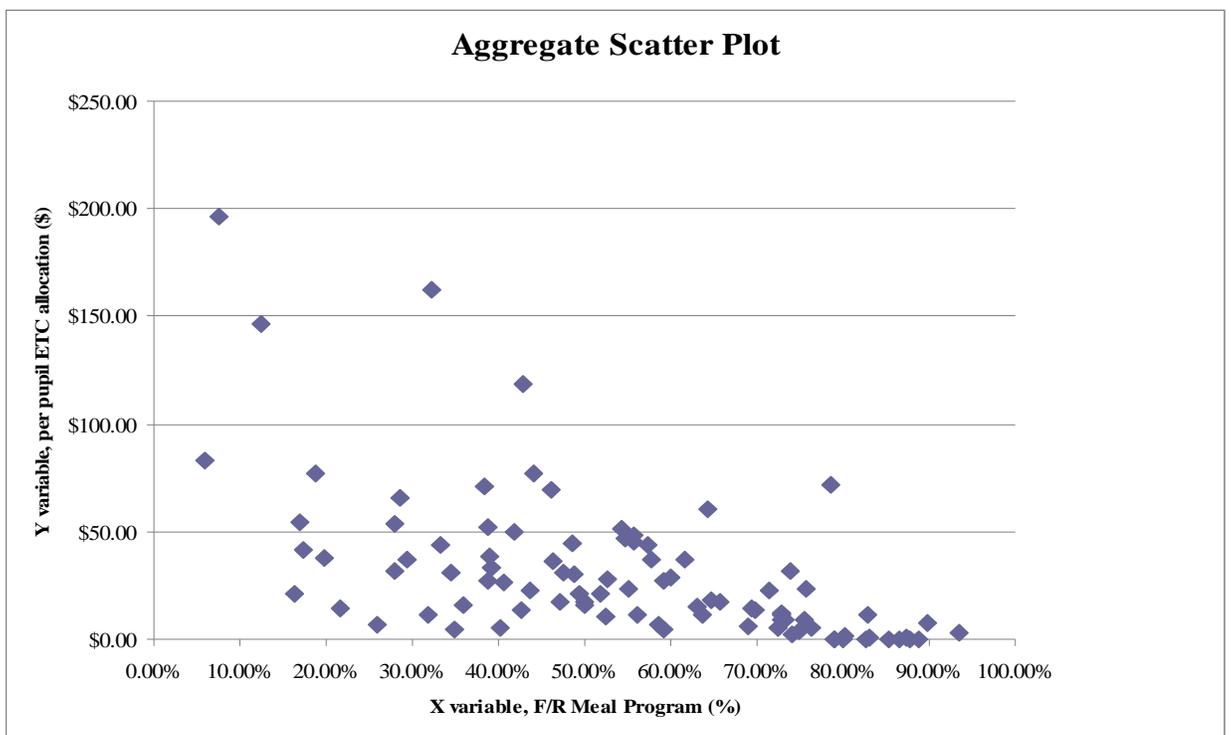
What is the relationship between per pupil education tax credit revenues and the percentage of students eligible for the free/reduced meal program?

Statistical software generated values for the X variable ($M = 54.18\%$, $SD = 21.57\%$) and Y variable ($M = \$30.72$, $SD = \$34.64$). See Appendix K for a full view of

aggregate descriptive statistics. When the X and Y variables were plotted on a graph the direction of relationship between the variables clearly emerged. The slope of the line ran downward from left to right suggesting a negative association. Put differently, as the X value increased, the Y value decreased (see Figure 7).

Figure 7

Aggregate Scatter Plot



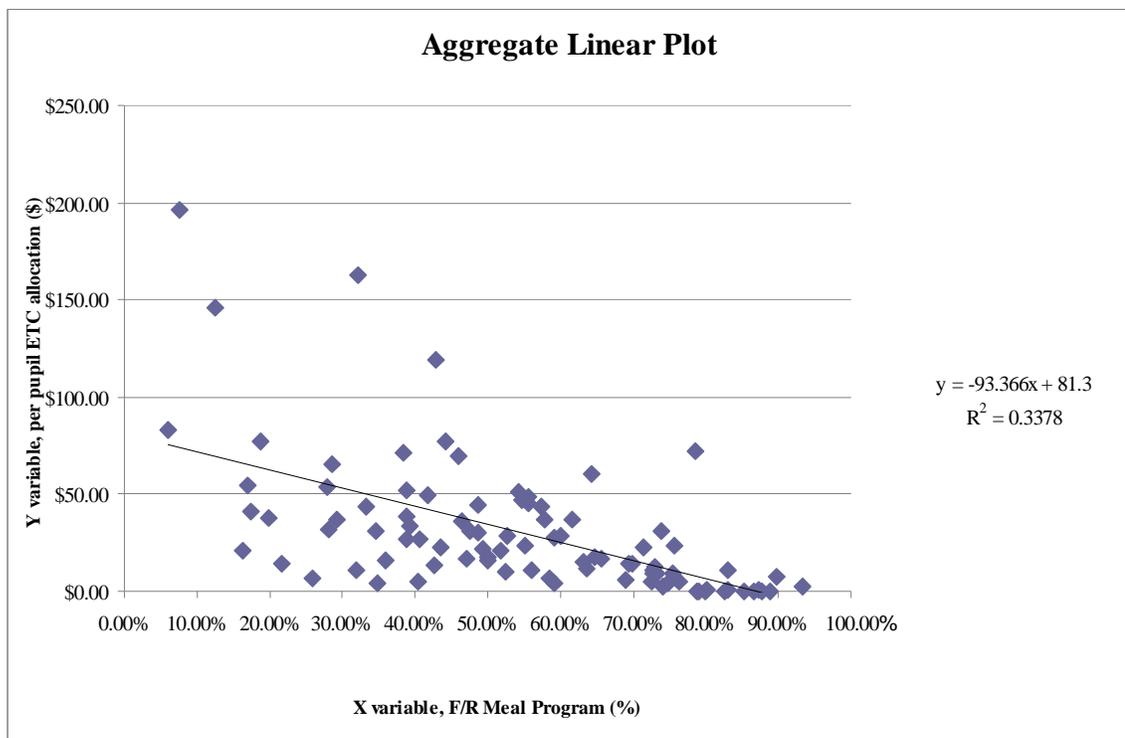
The negative association between variables was reinforced by the Pearson r correlation coefficient ($r = -.58, p < .001$) which proved statistically significant.

Research Question 2

To what extent can the relationship between these two variables be predicted and how reliable is the linear relationship?

Not all data points fell on a straight line based on the results of the scatter plot as seen in Figure 7. As such, an OLS regression model was generated which yielded a best-fit line (see Figure 8).

Figure 8

Aggregate Linear Plot

The OLS regression model generated values for the slope ($b = -93.366x$) and intercept ($a = 81.3$) and allowing for prediction of Y given X . To measure the reliability of the linear relationship between the X and Y values an R^2 value was generated (.33) suggesting that 33% of the variability in the Y variable could be explained by the X variable.

Research Question 3

Do education tax credits improve equity?

Combining the statistical outputs from the correlation, OLS regression analysis, and including ANOVA data on significance and probability provided the best fit between the X and Y variables: $r = -.58$, $R^2 = .33$, Adjusted $R^2 = .33$, $F(1,90) = 45.91$, $p < .001$. The beta weight was negative suggesting that unified school districts with higher percentages of students eligible for the free/reduced meal program received lower per pupil education tax credit revenues. See Appendix L for a full view of aggregate regression and ANOVA statistics.

CHAPTER 5

SUMMARY AND DISCUSSION

The final chapter of the dissertation provides an overview of the study, the problem statement, and methods used. The balance of this chapter summarizes the results, discusses the implications of the study, and offers recommendations for future research.

Overview of Study, Problem Statement, and Methodology

In 1997 the Arizona legislature passed a public education tax credit bill that allowed state income tax payers a dollar-for-dollar tax credit for donations to public schools for extracurricular activities and character education programs. Unfortunately in the haste to get the bill passed there was no time for legislative review, staff analysis, or public scrutiny on the potential impact of the proposed bill. There should have been concern raised on whether the public education tax credit bill would result in an equitable distribution funds on the following grounds.

One, it would be unlikely that low-income families would participate in the public school tax credit provision given that they have little discretionary income and little if any tax liability. Two, while middle and upper-income families would likely participate in the public school tax credit provision there would be no guarantee that they would earmark their contributions to the neediest public schools. Three, since Arizona state law would require school districts to use funds as prescribed by donors school districts would

be prohibited from redistributing public school tax revenues from schools that received significant revenues to schools that received few.

Twelve years after the bill was passed, there has been a boon in public education tax credit revenues, but a bust in the equitable distribution of those funds. If there was an equitable distribution of funds then the per pupil education tax credit allocation would roughly be the same, but this is not the case given the distribution variance. We reached this conclusion after studying the relationship between per pupil education tax credit revenues and the percentage of students eligible for the free/reduced meal program among 92 unified public for the years 2005, 2006, and 2007. To test and measure the relationship between these two variables, correlation and regression analysis was used to answer the following three research questions that guided this study:

1. What is the relationship between per pupil education tax credit revenues and the percentage of students eligible for the free/reduced meal program?
2. To what extent can the relationship between these two variables be predicted and how reliable is the linear relationship?
3. Do education tax credits improve equity?

Summary of Results

Upon examining the data across the three years of interest, one general observation is the following: data on the X (percentage of students eligible for the

free/reduced meal program) and Y (per pupil tax credit allocation) variables for the three years of interest were markedly similar. The “high” and “low” within the study were found in the 2005 and 2007 data. For instance, in 2005, the mean percentage of students eligible for the free/reduced meal program among the 92 unified school districts was 55.17% and the mean per pupil tax credit allocation was \$26.70 whereas for 2007 it was 53.13% and \$33.65 respectively. This would be suggestive of a negative relationship between the variables as school districts in 2005 with higher percentages of students eligible for the free/reduced meal program received lower per pupil education tax credit revenues whereas school districts in 2007 with lower percentages of students eligible for the free/reduced meal program received higher per public education tax credit revenues. This trend was statistically reinforced through the correlation and regression analysis. Before providing a summary of results to the three research questions that guided this study, the reader should know that the aggregate results for all three years of interest will be used for simplicity sake.

Research Question 1

What is the relationship between per pupil education tax credit revenues and the percentage of students eligible for the free/reduced meal program?

After plotting a graph with paired X and Y values, the scatter plot revealed the relationship between the X and Y variables to be negative as the slope of the line ran downward from left to right. The negative association between variables was reinforced

by the Pearson r correlation coefficient ($r = -.58, p < .001$) which proved statistically significant. In short, it was shown that there was statistically strong negative correlation between the X and Y variables.

Research Question 2

To what extent can the relationship between these two variables be predicted and how reliable is the linear relationship?

Since it was expected that not all data points would fall on a straight line, a best-fit line was created which generated values for the slope ($b = -93.366x$) and intercept ($a = 81.3$) allowing for prediction of Y given X . To measure the reliability of the linear relationship between the X and Y values an R^2 value was generated (.33) suggesting that 33% of the variability in the Y variable could be explained by the X variable. This again was statistically significant given that in the social and behavioral sciences R^2 values in the range of 25 to 36% are considered fairly high.

Research Question 3

Do education tax credits improve equity?

To determine if the public education tax credit program in Arizona had resulted in a equitable distribution of funds, statistical outputs from correlation, regression, and ANOVA data provided the best fit between the X and Y variables: $r = -.58, R^2 = .33, \text{Adjusted } R^2 = .33, F(1,90) = 45.91, p < .001$. The beta weight was negative indicating

that as a school district's percentage of the free/reduced meal program increased by one percentage point, the per pupil education tax credit decreased by 93 cents. This suggested that unified school districts with higher percentages of students eligible for the free/reduced meal program received lower per pupil education tax credit revenues. Again, the fairly high correlation coefficient proved statistically significant.

Implications of Study

Given the negative beta weight ($b = -93.366x$) found in this study and cost of the public school tax credit provision to the state, to maintain the status quo would seem to be poor public policy and irresponsible. To allow school districts with higher poverty to receive fewer tax credit revenues while school districts with lower poverty receive greater tax credit revenues is not only inequitable, but runs afoul of good public policy. Good public policy would be evidenced in the public school tax credit provision resulting in the "greatest good for the greatest number" not the "greatest resources for those with the greatest wealth." Given the dire economic situation of the state with record budgetary shortfalls, to allow the state treasury to forego nearly 50 million dollars annually (based on most recent 2007 Arizona Department of Revenue data) as a result of the public school tax credit provision would seem irresponsible. The responsible thing to do would be to say that the state simply can not afford the education tax credit program and not dismantle the state to meet projected budget deficits as a result of tax credits.

To maintain the status quo with the public school tax credit provision does not serve the children, families, educators, or citizens of Arizona well. In fact, public education tax credit provisions such as Arizona's do not help diminish social inequalities, but have the effect of exacerbating the very inequalities that public schools are suppose to erase (Gutmann, 1987). Furthermore, the public school tax credit provision has drawn down tax revenues for the state at a time of economic downturn which will almost surely result in higher taxes, fewer government jobs, and less government social programs at a time when the citizens of Arizona need government most. Again, it is the low-income families and not the middle and upper-income families that will be most adversely affected by these difficult budgetary realities. As such, two alternative courses of action should be considered: (1) modifying the statute or (2) repealing the statute. Each will now be taken up individually.

Modify the Statute

One option would be to modify the public school tax credit provision in the following manner: (1) allow schools to determine how revenues are to be used and school districts to redistribute revenues to the neediest schools and (2) capping the annual tax credit allotment for the state. Modifying the statute to allow schools the freedom to use the resources as they see fit could be the most effective use of funds. In the end, the things that students may need most in schools with higher poverty may not be fee-driven extracurricular activities, but functional bathrooms, bilingual teaching aides, up-to-date classroom computers, and competitive school teacher salaries (Kozol, 1991). Modifying

the statute to allow school districts to redistribute revenues to the neediest schools could result in the most equitable use of funds. Clearly, allowing the “market to decide” has resulted in an inequitable distribution of public education tax credit funds so school districts must intervene to get an equitable share of funds to the neediest schools.

Modifying the statute to impose a cap on the annual tax credit allotment for the state would be in order. Since the inception of the public school tax credit provision the annual revenues generated by tax credit have steadily risen with no foreseeable end in sight. Some limits must be put in place to offset the reduced tax revenues taken in by the state that result from the tax credits.

However, as Moses points out, such modifications would almost surely be met with resistance by conservatives in the state legislature that hold a majority vote. Conservatives could claim that such modifications would result in excessive government involvement. The statutory modifications offered would result in greater public control over the private decisions involved in the education tax credit provision, but could be at the risk of removing the very incentives that have compelled families to give. If middle and upper-income families could no longer control “what” schools were to spend their tax credit contributions on and “which” schools received their contributions, it is not at all clear that such families would continue giving.

Repeal the Statute

Another option would be to simply repeal the public school education tax credit statute all together on the following two grounds: (1) inequitable distribution of funds and (2) cost recovery. One, the public school tax credit provision has resulted in an inequitable distribution of funds as evidenced in this study. For as much as privatized schemes such as education tax credits have been touted for leading to greater efficiency, they have not led to greater equality (Berliner & Biddle, 1995). As such, repealing the public school tax credit provision could remedy poor public policy of past years. Two, given the severe economic downturn and budgetary shortfalls, the state treasury could capture significant tax revenues that could sorely be used to shore up state government rather than hike taxes, issue the proverbial “pink slips” to government employees, and make deep cuts in government social programs to meet current and projected budget deficits that result from the tax credits.

However, the notion of repealing the public school tax credit provision would not occur in a vacuum. Remember, the public school tax credit manifested only after a number of failed attempts to pass a voucher plan during the late 1990s. As a workaround and political capitulation, the private school tax credit program was only accepted with the inclusion of a public school tax credit provision. In short, the whole AETC program would likely have to be repealed which is much more complicated and unlikely.

Recommendations for Future Research

Additional research would be recommended in a few areas related to this study including: (1) outliers, (2) a multivariate approach, (3) how school districts attempt to tap tax credit donors, (4) how tax credit revenues are allocated at the school site, and (5) the impact of imposing a means test on those that would participate in the public school tax credit provision. Each will be taken up individually.

Outliers

During the course of test and measure, two unified school districts proved to be outliers and were removed from the study for being 10 standard deviations from the mean. Nadaburg and Prescott Unified School Districts received \$374.66 and \$398.00 respectively in the aggregate analysis. Both are worthy of additional research to determine why each school district received such a high per pupil education tax credit allocation. A qualitative approach that would employ interviewing school site principals might glean information that could greatly inform this study.

Multivariate Approach

This dissertation focused on two variables of interest and while there was statistical significance in the R^2 values (the variability in the Y variable could be explained by the X variable) there are clearly other contributing variables at play. Future research could include additional independent variables to more thoroughly test the independent variable used in this study. Such multivariate studies would surely contribute

to the literature by providing further explanation as to what ultimately determines a school district's per pupil education tax credit allocation.

School District Marketing Plans

Through this study it became clear that some school districts were more aggressive and adept at tapping potential tax credit donors than others. The line of demarcation seemed to center on a school districts relative wealth. In short, school districts with lower percentage of students eligible for the free/reduced meal program seemed more inclined to have dedicated websites that encouraged and focused giving, marketing materials that were mailed to parents, and staff in district offices to administer giving and financial reconciliation. Even so, little is known about this area. As such, future research could examine the extent to which superintendents and/or principals launch marketing campaigns, costs in doing, and rate-of-return.

School Site Spending of Tax Credits

Arizona statute requires that public school tax credit funds be spent on extracurricular activities and character education. In conducting research for this study it became clear that the lion's share of funds was directed towards extracurricular activities, but what wasn't so clear was any standard definition of what extracurricular activities entailed. The whole matter seemed at best subjective. The Department of Revenue is hardly interested or in a position to regulate what tax credit funds are spent on, but there will be school districts that will stretch the meaning of "extracurricular" and test future

legislative waters. As such, future research into what school districts are actually spending education tax credit funds on would be worthwhile and fruitful.

Means Test

A review of the literature on the 7 education tax credit programs currently in operation revealed that at least one state with a public school tax provision utilized a means test. In Minnesota, no tax credit is available for families whose income is greater than \$37,500. In all likelihood the rationale behind this means test was to prevent the tax credit from becoming a mere tax loophole for middle and upper-income families. Based on Wilson's findings on the beneficiaries of the public school tax credit provision for the first three years of the program (1998-2000), applying such a means test in Arizona would not only dramatically reduce the number of families that could participate, but reduce the overall revenues generated by the tax credit. At first glance, this could be a strategy to make the public school tax credit more equitable while also serving as a de facto cap. However, this is purely conjecture. What is needed is scholarly analysis of the potential impact of such a means test on the public school tax credit provision in Arizona.

APPENDIX A: 2005 DATA TABLE

Table showing the free and reduced percentage and dollar per student of revenue for each of the 92 Arizona Unified School Districts in 2005

<i>USD</i>	<i>F/R %</i>	<i>\$/Student</i>	<i>USD</i>	<i>F/R %</i>	<i>\$/Student</i>	<i>USD</i>	<i>F/R %</i>	<i>\$/Student</i>	<i>USD</i>	<i>F/R %</i>	<i>\$/Student</i>
Ajo	62.49%	\$13.56	Fountain Hills	14.67%	\$168.26	Mayer	76.43%	\$22.27	Santa Cruz Valley	68.57%	\$8.72
Amphitheater	37.95%	\$39.50	Fredonia-Moccasin	71.02%	\$24.90	Mesa	45.48%	\$64.08	Scottsdale	18.14%	\$61.72
Apache Junction	37.75%	\$22.15	Ft Thomas	93.39%	\$8.70	Miami	62.51%	\$22.81	Sedona-Oak Creek Joint	32.35%	\$180.01
Ash Fork Joint	93.28%	\$1.87	Ganado	83.40%	\$0.00	Morenci	26.59%	\$9.27	Seligman	49.97%	\$21.19
Benson	41.17%	\$21.88	Gila Bend	74.59%	\$6.59	Nogales	73.13%	\$4.38	Show Low	49.86%	\$18.36
Bisbee	61.20%	\$27.08	Gilbert	17.17%	\$51.91	Page	69.05%	\$14.37	Sierra Vista	35.33%	\$33.69
Blue Ridge	45.00%	\$45.31	Globe	54.52%	\$9.35	Paradise Valley	28.42%	\$43.64	Snowflake	49.95%	\$26.32
Camp Verde	47.85%	\$17.16	Grand Canyon	42.15%	\$30.85	Parker	71.83%	\$5.92	St David	36.09%	\$40.62
Cave Creek	6.20%	\$63.68	Hayden-Winkelman	71.44%	\$7.29	Payson	42.91%	\$109.53	St Johns	58.17%	\$16.18
Cedar	90.42%	\$0.92	Heber-Overgaard	61.21%	\$38.72	Peach Springs	81.07%	\$0.82	Sunnyside	83.09%	\$9.11
Chandler	29.93%	\$56.84	Higley	17.93%	\$0.00	Peoria	29.13%	\$34.44	Superior	88.50%	\$6.08
Chinle	80.19%	\$0.65	Holbrook	70.34%	\$13.78	Pima	68.27%	\$9.55	Tanque Verde	6.91%	\$208.96
Chino Valley	46.09%	\$39.62	Humboldt	45.02%	\$23.69	Pinon	88.55%	\$0.00	Thatcher	33.39%	\$6.92
Clifton	75.94%	\$16.82	Indian Oasis-Baboquivari	81.42%	\$2.46	Queen Creek	24.24%	\$13.47	Tombstone	57.27%	\$16.01
Colorado City	83.36%	\$8.79	J O Combs	37.88%	\$22.22	Ray	68.05%	\$9.03	Tuba City	78.25%	\$1.38
Coolidge	56.69%	\$5.29	Joseph City	48.47%	\$20.20	Red Mesa	81.78%	\$0.00	Tucson	57.02%	\$36.22
Deer Valley	19.67%	\$32.06	Kayenta	82.96%	\$0.40	Round Valley	49.95%	\$11.54	Vail	18.39%	\$0.97
Douglas	75.28%	\$4.09	Kingman	49.55%	\$14.31	Saddle Mountain	51.03%	\$7.56	Whiteriver	82.44%	\$0.25
Duncan	45.83%	\$13.81	Lake Havasu	44.17%	\$68.12	Safford	59.61%	\$9.80	Wickenburg	35.73%	\$22.07
Dysart	46.82%	\$31.66	Littlefield	82.97%	\$56.22	Sahuarita	43.54%	\$37.02	Willcox	63.96%	\$35.54
Flagstaff	38.75%	\$63.27	Mammoth-San Manuel	77.04%	\$19.48	San Carlos	89.33%	\$0.42	Williams	53.55%	\$33.73
Florence	41.81%	\$3.52	Marana	29.03%	\$26.84	San Simon	58.09%	\$52.14	Window Rock	77.70%	\$0.00
Flowing Wells	60.52%	\$32.59	Maricopa	38.27%	\$5.69	Sanders	82.02%	\$0.44	Winslow	57.20%	\$8.12

APPENDIX B: 2005 DESCRIPTIVE STATISTICS

Table showing the descriptive statistics for 2005 free and reduced percentage and dollar per student of revenue

<i>F/R %</i>		<i>\$/Student</i>	
Mean	55.17%	Mean	\$26.70
Standard Error	2.30%	Standard Error	\$3.73
Median	55.60%	Median	\$16.50
Standard Deviation	22.04%	Standard Deviation	\$35.76
Sample Variance	4.86%	Sample Variance	\$1,278.51
Range	87.19%	Range	\$208.96
Minimum	6.20%	Minimum	\$ -
Maximum	93.39%	Maximum	\$208.96
Count	92	Count	92

APPENDIX C: 2005 REGRESSION AND ANOVA STATISTICS

Table showing the regression and ANOVA statistics for 2005 free and reduced percentage and dollar per student of revenue

Multiple R	0.52878					
R Square	0.27961					
Adjusted R Square	0.27161					
Standard Error	30.51656					
Observations	92					
ANOVA						
	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	32531.4	32531.4	34.9327	6.02E-08	
Residual	90	83813.43	931.26			
Total	91	116344.83				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	74.0319	8.6165	8.5919	2.43E-13	56.9138	91.1501
F/R %	-85.7852	14.5143	-5.9104	6.02E-08	-114.6204	-56.95

APPENDIX D: 2006 DATA TABLE

Table showing the free and reduced percentage and dollar per student of revenue for each of the 92 Arizona Unified School Districts in 2006

<i>USD</i>	<i>F/R %</i>	<i>\$/Student</i>	<i>USD</i>	<i>F/R %</i>	<i>\$/Student</i>	<i>USD</i>	<i>F/R %</i>	<i>\$/Student</i>	<i>USD</i>	<i>F/R %</i>	<i>\$/Student</i>
Ajo	64.85%	\$21.32	Fountain Hills	12.63%	\$157.03	Mayer	77.66%	\$25.06	Santa Cruz Valley	69.02%	\$18.48
Amphitheater	38.81%	\$54.74	Fredonia-Moccasin	70.79%	\$26.66	Mesa	45.99%	\$73.79	Scottsdale	18.31%	\$82.25
Apache Junction	38.57%	\$25.48	Ft Thomas	93.39%	\$0.00	Miami	59.82%	\$30.05	Sedona-Oak Creek Joint	31.79%	\$145.36
Ash Fork Joint	69.35%	\$8.77	Ganado	81.06%	\$0.00	Morenci	28.60%	\$7.04	Seligman	52.30%	\$23.09
Benson	41.19%	\$29.18	Gila Bend	75.26%	\$11.59	Nogales	71.26%	\$5.24	Show Low	47.96%	\$18.57
Bisbee	60.04%	\$29.66	Gilbert	16.21%	\$54.03	Page	63.25%	\$18.51	Sierra Vista	34.22%	\$29.62
Blue Ridge	40.80%	\$51.93	Globe	53.63%	\$10.69	Paradise Valley	27.85%	\$56.80	Snowflake	51.76%	\$28.22
Camp Verde	52.42%	\$23.79	Grand Canyon	50.53%	\$40.75	Parker	71.03%	\$14.45	St David	33.68%	\$55.17
Cave Creek	6.16%	\$85.12	Hayden-Winkelman	72.75%	\$5.12	Payson	40.87%	\$119.63	St Johns	54.45%	\$29.80
Cedar	87.50%	\$0.98	Heber-Overgaard	53.03%	\$52.59	Peach Springs	93.38%	\$0.00	Sunnyside	82.79%	\$11.83
Chandler	27.61%	\$68.39	Higley	15.18%	\$38.19	Peoria	29.53%	\$41.17	Superior	90.29%	\$6.67
Chinle	80.19%	\$1.27	Holbrook	69.14%	\$13.13	Pima	67.32%	\$20.69	Tanque Verde	7.88%	\$175.98
Chino Valley	49.98%	\$50.73	Humboldt	42.94%	\$22.07	Pinon	87.35%	\$0.22	Thatcher	31.96%	\$11.60
Clifton	72.22%	\$13.04	Indian Oasis-Baboquivari	73.87%	\$4.29	Queen Creek	21.31%	\$15.36	Tombstone	57.71%	\$23.46
Colorado City	73.31%	\$11.19	J O Combs	35.44%	\$18.20	Ray	66.33%	\$14.13	Tuba City	71.88%	\$3.46
Coolidge	58.92%	\$4.13	Joseph City	48.61%	\$16.75	Red Mesa	78.96%	\$0.00	Tucson	57.14%	\$44.76
Deer Valley	19.56%	\$40.52	Kayenta	83.50%	\$0.67	Round Valley	50.91%	\$17.10	Vail	17.30%	\$54.73
Douglas	76.45%	\$4.81	Kingman	48.21%	\$13.78	Saddle Mountain	61.56%	\$6.13	Whiteriver	87.13%	\$0.43
Duncan	43.20%	\$26.22	Lake Havasu	43.99%	\$78.99	Safford	56.28%	\$11.17	Wickenburg	37.80%	\$8.98
Dysart	48.84%	\$35.96	Littlefield	73.19%	\$156.96	Sahuarita	38.43%	\$40.13	Willcox	61.85%	\$30.10
Flagstaff	39.00%	\$76.47	Mammoth-San Manuel	72.45%	\$20.88	San Carlos	89.84%	\$0.26	Williams	55.56%	\$42.82
Florence	38.37%	\$3.88	Marana	25.95%	\$36.52	San Simon	54.74%	\$57.96	Window Rock	79.63%	\$0.00
Flowing Wells	61.46%	\$42.32	Maricopa	33.62%	\$0.00	Sanders	85.71%	\$0.00	Winslow	54.93%	\$16.36

APPENDIX E: 2006 DESCRIPTIVE STATISTICS

Table showing the descriptive statistics for 2006 free and reduced percentage and dollar per student of revenue

<i>F/R %</i>		<i>\$/Student</i>	
Mean	54.23%	Mean	\$31.80
Standard Error	2.27%	Standard Error	\$3.76
Median	54.59%	Median	\$21.10
Standard Deviation	21.80%	Standard Deviation	\$36.10
Sample Variance	4.75%	Sample Variance	\$1,303.46
Range	87.23%	Range	\$175.98
Minimum	6.16%	Minimum	\$ -
Maximum	93.39%	Maximum	\$175.98
Count	92	Count	92

APPENDIX F: 2006 REGRESSION AND ANOVA STATISTICS

Table showing the regression and ANOVA statistics for 2006 free and reduced percentage and dollar per student of revenue

Multiple R	0.56147
R Square	0.31525
Adjusted R Square	0.30764
Standard Error	30.04106
Observations	92

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	37392.84	37392.8	41.4341	5.80E-09
Residual	90	81221.85	902.47		
Total	91	118614.69			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	82.227	8.4371	9.7459	9.64E-16	65.4652	98.9888
F/R %	-92.9841	14.4454	-6.4369	5.80E-09	-121.6824	-64.2858

APPENDIX G: 2007 DATA TABLE

Table showing the free and reduced percentage and dollar per student of revenue for each of the 92 Arizona Unified School Districts in 2007

<i>USD</i>	<i>F/R %</i>	<i>\$/Student</i>	<i>USD</i>	<i>F/R %</i>	<i>\$/Student</i>	<i>USD</i>	<i>F/R %</i>	<i>\$/Student</i>	<i>USD</i>	<i>F/R %</i>	<i>\$/Student</i>
Ajo	63.53%	\$0.05	Fountain Hills	10.01%	\$113.66	Mayer	72.78%	\$23.25	Santa Cruz Valley	71.81%	\$14.35
Amphitheater	39.42%	\$61.06	Fredonia-Moccasin	72.71%	\$16.14	Mesa	46.63%	\$71.49	Scottsdale	20.04%	\$87.86
Apache Junction	40.30%	\$33.44	Ft Thomas	93.39%	\$0.00	Miami	55.40%	\$29.54	Sedona-Oak Creek Joint	32.31%	\$162.21
Ash Fork Joint	55.80%	\$16.16	Ganado	83.30%	\$0.00	Morenci	22.71%	\$4.72	Seligman	55.63%	\$40.32
Benson	39.44%	\$28.92	Gila Bend	68.62%	\$15.59	Nogales	73.09%	\$5.11	Show Low	50.05%	\$27.59
Bisbee	58.65%	\$29.67	Gilbert	17.37%	\$57.29	Page	64.76%	\$18.69	Sierra Vista	34.10%	\$29.54
Blue Ridge	39.68%	\$51.60	Globe	49.12%	\$10.69	Paradise Valley	27.56%	\$59.71	Snowflake	44.60%	\$36.86
Camp Verde	55.37%	\$23.20	Grand Canyon	46.29%	\$37.61	Parker	77.07%	\$6.81	St David	29.95%	\$35.16
Cave Creek	5.67%	\$99.76	Hayden-Winkelman	62.67%	\$5.68	Payson	44.81%	\$127.71	St Johns	52.85%	\$23.81
Cedar	83.99%	\$0.88	Heber-Overgaard	52.65%	\$54.58	Peach Springs	91.98%	\$0.00	Sunnyside	82.91%	\$12.64
Chandler	28.25%	\$71.59	Higley	15.65%	\$24.66	Peoria	29.28%	\$36.16	Superior	90.31%	\$9.20
Chinle	80.19%	\$1.73	Holbrook	68.62%	\$15.66	Pima	58.40%	\$23.41	Tanque Verde	8.11%	\$204.16
Chino Valley	49.64%	\$43.68	Humboldt	42.78%	\$22.49	Pinon	87.33%	\$0.52	Thatcher	30.19%	\$14.35
Clifton	70.53%	\$7.33	Indian Oasis-Baboquivari	69.31%	\$5.55	Queen Creek	19.15%	\$14.38	Tombstone	58.35%	\$72.01
Colorado City	69.87%	\$6.99	J O Combs	34.25%	\$7.64	Ray	55.08%	\$21.58	Tuba City	71.88%	\$2.89
Coolidge	61.71%	\$3.11	Joseph City	44.14%	\$14.30	Red Mesa	78.99%	\$0.00	Tucson	57.98%	\$50.22
Deer Valley	20.14%	\$41.20	Kayenta	82.54%	\$0.44	Round Valley	48.90%	\$24.32	Vail	16.63%	\$68.20
Douglas	76.96%	\$6.26	Kingman	52.32%	\$20.15	Saddle Mountain	63.04%	\$6.31	Whiteriver	86.47%	\$0.26
Duncan	39.06%	\$0.15	Lake Havasu	44.32%	\$83.79	Safford	52.41%	\$12.25	Wickenburg	44.01%	\$69.70
Dysart	46.88%	\$25.27	Littlefield	79.68%	\$2.69	Sahuarita	34.80%	\$39.13	Willcox	67.10%	\$116.35
Flagstaff	37.47%	\$73.00	Mammoth-San Manuel	72.10%	\$53.74	San Carlos	80.72%	\$0.27	Williams	54.70%	\$64.95
Florence	40.72%	\$7.91	Marana	29.14%	\$32.83	San Simon	49.80%	\$44.49	Window Rock	79.37%	\$0.00
Flowing Wells	63.02%	\$36.04	Maricopa	32.51%	\$7.32	Sanders	69.15%	\$0.00	Winslow	54.92%	\$111.54

APPENDIX H: 2007 DESCRIPTIVE STATISTICS

Table showing the descriptive statistics for 2007 free and reduced percentage and dollar per student of revenue

<i>F/R %</i>		<i>\$/Student</i>	
Mean	53.13%	Mean	\$33.65
Standard Error	2.23%	Standard Error	\$3.94
Median	53.77%	Median	\$23.22
Standard Deviator	21.40%	Standard Deviation	\$37.84
Sample Variance	4.58%	Sample Variance	\$1,431.50
Range	87.72%	Range	\$204.16
Minimum	5.67%	Minimum	\$ -
Maximum	93.39%	Maximum	\$204.16
Count	92	Count	92

APPENDIX I: 2007 REGRESSION AND ANOVA STATISTICS

Table showing the regression and ANOVA for 2007 free and reduced percentage and dollar per student of revenue

Multiple R	0.54707					
R Square	0.29929					
Adjusted R Square	0.2915					
Standard Error	31.84671					
Observations	92					
ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	38987.1	38987.1	38.4408	1.68E-08	
Residual	90	91279.15	1014.21			
Total	91	130266.26				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	85.0365	8.9289	9.5238	2.79E-15	67.2978	102.7753
F/R %	-96.7262	15.6009	-6.2001	1.68E-08	-127.7201	-65.7324

APPENDIX J: AGGREGATE DATA TABLE

Table showing the Free and Reduced Percentage and Dollar Per Student of Revenue for Each of the 92 Arizona Unified School Districts for the Aggregate of 2005-2007

<i>USD</i>	<i>F/R %</i>	<i>\$/Student</i>	<i>USD</i>	<i>F/R %</i>	<i>\$/Student</i>	<i>USD</i>	<i>F/R %</i>	<i>\$/Student</i>	<i>USD</i>	<i>F/R %</i>	<i>\$/Student</i>
Ajo	63.62%	\$11.64	Fountain Hills	12.44%	\$146.32	Mayer	75.62%	\$23.53	Santa Cruz Valley	69.80%	\$13.85
Amphitheater	38.73%	\$51.77	Fredonia-Moccasin	71.51%	\$22.56	Mesa	46.03%	\$69.79	Scottsdale	18.83%	\$77.28
Apache Junction	38.87%	\$27.02	Ft Thomas	93.39%	\$2.90	Miami	59.24%	\$27.47	Sedona-Oak Creek Joint	32.15%	\$162.53
Ash Fork Joint	0.73	\$8.93	Ganado	82.59%	\$0.00	Morenci	25.97%	\$7.01	Seligman	52.63%	\$28.20
Benson	40.60%	\$26.66	Gila Bend	72.83%	\$11.25	Nogales	72.49%	\$4.91	Show Low	49.29%	\$21.51
Bisbee	59.96%	\$28.80	Gilbert	16.92%	\$54.41	Page	65.69%	\$17.19	Sierra Vista	34.55%	\$30.95
Blue Ridge	41.82%	\$49.61	Globe	52.43%	\$10.24	Paradise Valley	27.94%	\$53.38	Snowflake	48.77%	\$30.47
Camp Verde	51.88%	\$21.38	Grand Canyon	46.32%	\$36.40	Parker	73.31%	\$9.06	St David	33.24%	\$43.65
Cave Creek	6.01%	\$82.85	Hayden-Winkelman	68.95%	\$6.03	Payson	42.87%	\$118.96	St Johns	55.16%	\$23.26
Cedar	87.30%	\$0.92	Heber-Overgaard	55.63%	\$48.63	Peach Springs	88.81%	\$0.27	Sunnyside	82.93%	\$11.20
Chandler	28.60%	\$65.61	Higley	16.26%	\$20.95	Peoria	29.31%	\$37.26	Superior	89.70%	\$7.32
Chinle	80.19%	\$1.22	Holbrook	69.37%	\$14.19	Pima	64.66%	\$17.88	Tanque Verde	7.63%	\$196.37
Chino Valley	48.57%	\$44.68	Humboldt	43.58%	\$22.75	Pinon	87.74%	\$0.24	Thatcher	31.85%	\$10.96
Clifton	72.89%	\$12.40	Indian Oasis-Baboquivari	74.87%	\$4.10	Queen Creek	21.57%	\$14.41	Tombstone	57.78%	\$37.16
Colorado City	75.51%	\$8.99	J O Combs	35.86%	\$16.02	Ray	63.15%	\$14.91	Tuba City	74.01%	\$2.57
Coolidge	59.10%	\$4.18	Joseph City	47.07%	\$17.08	Red Mesa	79.91%	\$0.00	Tucson	57.38%	\$43.73
Deer Valley	19.79%	\$37.93	Kayenta	83.00%	\$0.50	Round Valley	49.92%	\$17.65	Vail	17.44%	\$41.30
Douglas	76.23%	\$5.05	Kingman	50.03%	\$16.08	Saddle Mtn.	58.55%	\$6.67	Whiteriver	85.35%	\$0.32
Duncan	42.70%	\$13.39	Lake Havasu	44.16%	\$76.97	Safford	56.10%	\$11.08	Wickenburg	39.18%	\$33.58
Dysart	47.51%	\$30.97	Littlefield	78.61%	\$71.96	Sahuarita	38.92%	\$38.76	Willcox	64.30%	\$60.66
Flagstaff	38.41%	\$70.92	Mammoth-San Manuel	73.86%	\$31.37	San Carlos	86.63%	\$0.32	Williams	54.60%	\$47.17
Florence	40.30%	\$5.10	Marana	28.04%	\$32.06	San Simon	54.21%	\$51.53	Window Rock	78.90%	\$0.00
Flowing Wells	61.67%	\$36.98	Maricopa	34.80%	\$4.34	Sanders	78.96%	\$0.15	Winslow	55.68%	\$45.34

APPENDIX K: AGGREGATE DESCRIPTIVE STATISTICS

Table showing the descriptive statistics for the aggregate free and reduced percentage and dollar per student of revenue

<i>F/R %</i>		<i>\$/Student</i>	
Mean	54.18%	Mean	\$30.72
Standard Error	2.25%	Standard Error	\$3.61
Median	54.88%	Median	\$21.44
Standard Deviation	21.57%	Standard Deviation	\$34.64
Sample Variance	4.65%	Sample Variance	\$1,200.14
Range	87.38%	Range	\$196.37
Minimum	6.01%	Minimum	\$ -
Maximum	93.39%	Maximum	\$196.37
Count	92	Count	92

APPENDIX L: AGGREGATE REGRESSION AND ANOVA STATISTICS

Table showing the regression and ANOVA for the aggregate free and reduced percentage and dollar per student of revenue

Multiple R	0.58122					
R Square	0.33782					
Adjusted R Square	0.33046					
Standard Error	28.34686					
Observations	92					
ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	36894.18	36894.18	45.9143	1.24E-09	
Residual	90	72318.98	803.54			
Total	91	109213.16				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	81.3	8.0288	10.126	1.56E-16	65.3494	97.2507
F/R %	-93.3662	13.7789	-6.776	1.24E-09	-120.7404	-65.9919

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