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Evaluating the effect of merit aid as a higher education *policy tool using time series analysis

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EVALUATING THE EFFECT OF MERIT AID AS A HIGHER EDUCATION POLICY TOOL USING TIME SERIES ANALYSIS

by

Michelle Johanna Nilson

Bachelor of Arts
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A dissertation submitted in partial fulfillment
of the requirements for the

Doctor of Philosophy Degree in Higher Education Administration
Department of Educational Leadership
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ABSTRACT

Evaluating the Effect of Merit Aid as a Higher Education Policy Tool Using Time Series Analysis

by

Michelle Johanna Nilson

Dr. Mario Martinez, Examination Committee Chair
Associate Professor of Higher Education
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Since 1991, seventeen states have dramatically altered the criteria they use to distribute student financial aid to include a larger proportion of merit-based awards. Across these states, the amounts and lengths of the awards vary. There are states, such as Georgia and Florida, which provide full tuition and fees for four or five years, depending on the program of study. In sharp contrast, Michigan's Merit Award Scholarship is a one time $2,500 award. States also differ in terms of the selection criteria used to award merit aid.

Using a quasi-experimental interrupted and pooled time series design derived from research on public budgeting, this research investigates the linkage between merit aid and participation by sector (public and private) and level (two- and four-year) in states and institutions. In this study, merit aid is characterized into three main categories: full tuition, partial tuition, and one-time payment of awards. Interrupted time series is applied to these three categories, to discern whether there are differences in merit aid programs and their effects on enrollment by sector and level. In addition, pooled time

series analysis is utilized to examine the effects of these programs by aid category across states, sectors and levels.

Findings indicate that the adoption of a merit aid policy significantly changed enrollment in 9 of the 15 states investigated in this study. While the results were mixed, generally, states experienced a greater long term positive effect than negative or short term effects, indicating that more students take advantage of the programs over time. Full tuition payment policies had a short term significant effect on enrollment in the 4-year public sector analysis. However, partial tuition payment policies had a significant positive long and short term effect on the 2-year public sector. This finding supports earlier work that theorized that merit aid encourages students who might not otherwise enroll to do so.

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My classmates, colleagues, friends and the faculty and staff at UNLV, in Las Vegas, and back in Michigan have been hugely important in my growth and development as a person and a scholar. They reinforced, challenged, and taught me a deeper understanding of the value of thoughtfulness, kindness, courage, compassion, integrity, family, diversity, and reminded me of the beauty and power of friendship- and for that I am eternally grateful to them.

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CHAPTER 1

INTRODUCTION

The principle of rewarding students for their success and hard work is not a novel idea. High performing students are rewarded with opportunities to participate in many activities from attendance at exclusive and highly selective schools, honors programs, and internships, to receiving private scholarships to support their endeavors. A recent state policy development in the reward system for high achieving students is merit based financial aid for postsecondary students. The need for continual, additional and new approaches that examine merit aid and its effects on participation is heightened by the tendency of states to "copy" policies from other states. Legislators, in particular in states surrounding Georgia, adopted similar merit aid policies as Georgia's 1993 first broadly available state merit aid program, in hopes of reaping some of the same benefits that they saw in Georgia (Cohen-Vogel & Ingle, 2006; McLendon, Heller, & Young 2005).

A recent examination by the Education Commission of the States found that since 1993, seventeen states have begun to reward meritorious students with financial aid (ECS, 2005). However, prior to 1993, the main criteria for student financial aid awards were financial need, with less than 10 percent of grant dollars going to merit aid (Heller, 2004). The three main purposes behind this legislation are to: 1) keep the best students in the state, 2) reward and encourage their hard work, and 3) promote college access and attainment (Heller, 2002).

Although states may emulate policies from each other, merit aid is a term that now encompasses a wide variety of student financial aid policies enacted across the states. On one end of the spectrum, there are states that award full tuition, fees, and even book money, as in the case of the Georgia HOPE scholarship. On the other end of the spectrum is Michigan's Merit Scholarship award, which is a one-time $2500 payment. Between these two extremes are several programs, such as the ones in Nevada, Missouri, and Mississippi, which pay on average up to $2,500 per year, with lifetime award limits of around $10,000 each.

There are relatively few studies that examine the full impact of these different types of policies on participation across all of the states, in part due to their relatively new arrival on the public policy scene. In a recent study using Census 2000 data from seven Southern states' merit aid programs, Dynarski (2003) found that the introduction of a merit aid program increased the probably of enrolling in postsecondary education by 5 to 7 percentage points. Each of the states in her study was in the South and they all had similar policies regarding the amounts of aid.

Other studies, which examine individual state programs, have met with mixed results. For example, Cornwell and Mustard (2003b) found that in states where tuition, student fees, and books are paid for, there was a significant effect on enrollment in the state; Heller (2003) found that in Michigan, where the award is limited, the incentive effects are marginal. However, the wide variety of merit aid programs and their different impacts on participation by sector (public and private) and level (two- and four-year) remains unexamined. In her 2004 dissertation, Patricia Farrell conducted a

comprehensive evaluation of existing merit aid policies at the state level and recommended further study of their impact on institutions, levels, and sectors.

Statement of the Problem

Given that merit aid has not provided a clear incentive effect in all of the states where it was adopted, there is some debate as to whether policy makers should look to merit financial aid programs to provide incentives for students. One issue that remains is that, upon examination of the debates about merit aid, there is little differentiation between types of merit aid programs and their corresponding effects on enrollment over time. This study is a longitudinal investigation of the impact of the different types of merit aid programs and their impact on enrollment by sector and level.

The literature on public policy can be instrumental in building an understanding of long term state finance policy changes. Public policy scholars routinely examine large scale interventions, such as programs similar to the merit aid grants. One such technique that has been useful in determining the impact of an intervention is the use of time series analysis. This type of post-hoc analysis is a longitudinal examination of patterns before and after an intervention, often using secondary data sets. Time series analysis has a long history of use in economics, public health and epidemiology, agriculture sciences, psychology, business, and public policy (Taggart, 1989).

Purpose of the Research

The purpose of this study is to examine the impact of merit aid on first time freshman enrollment by sector (private, non-profit and public institutions) and level (2-

year and 4-year institutions) in the twelve states that have had the policy for more than five years. Since policymakers in neighboring states often adopt policies that are similar, the merit aid policies were characterized into three types:

1. Full tuition and benefits;

2. Partial tuition for entire program; and

3. One time payment of partial tuition

The impact of these policies on institutional and state enrollment patterns was examined. Characterizing the types of merit aid programs serves to isolate and clarify the impact each of the three main types of programs commonly found in the states. In addition, the three types of merit aid policy were compared between types of programs to determine the relative impact on participation. For example, the full tuition and benefits programs were compared to the partial tuition and one time payment for partial tuition programs to determine if one of the programs had a larger impact on enrollment.

Significance of the Study

In a recent editorial article, Smart (2005) articulated the attributes of exemplary quantitative research. One of the suggestions Smart has for young scholars is that they borrow the "best examples of theoretical and methodological paradigms of other disciplines to important topics on the higher education research agenda" (p 465). This methodological technique is currently utilized largely in public policy (Holmes, M. D., Daudistel, H. C. & Taggart, W. A., 1992; Taggart, 1989) and economics; here it is transferred to higher education policy in order to analyze merit aid policies across the states. Time series analysis is not a new technique; it is a methodology that dates back to

early agricultural studies and has roots that date back over 400 years (Klein, 1997). This approach is novel in that there are few studies that utilize quasi-experimental time series techniques in higher education policy analysis.

One final suggestion that Smart has is that research have important implications for future research and practice and policy. From this time series analysis—and depending on the results of the analysis—a model that can be used in states to project their enrollments based on the type of merit aid policy that is adopted will be constructed. In addition, this study will inform future research using time series analysis as well as higher education policy by contributing to the research using a proven cross-disciplinary technique.

The study contributes to the knowledge of merit aid and its effect on enrollment in yet a third way. Many authors have investigated from a broad, state perspective, the effect of tuition increases or grant amounts on enrollment. The work of Dynarski (2001) looked at the impact of grants on enrollment. Others have proposed "standardized price response coefficients (SPRCs), which provides an elasticity measure, a change in the probability of enrollment for every $100 change in net price (e.g., Jackson & Weathersby, 1975; Leslie & Brinkman, 1988; McPherson, 1978)" (St. John, Asker, & Hu, 2001 in Paulsen & Smart, 2001.) Tierney (1980), found that "a $100 increase in grant offers by private relative to public institutions would increase the probability that such a student matriculates at a private institution to .67" (p. 541). By examining the impact of merit aid on enrollment, this research was able to determine whether significant differences in participation exist across programs, which may provide insight into the elasticity of merit aid on enrollment.

Research Questions

The gaps in the research raise several questions about merit aid programs, and their associated policy implications. The following research questions guided the data collection and analysis for the study:

State Level Analysis

1) How has merit aid impacted non-profit postsecondary participation in each of the states that has adopted this student financial aid policy?
2) What is the effect of the following three types of merit aid programs on state-level participation:
    a. Full-tuition programs
    b. Partial tuition programs
    c. One time payment programs

Sector (Public and Private) and Level (Two- and Four-Year)

3) How has merit aid impacted participation by sector and level in the states that have adopted this financial aid policy?
4) What is the effect on enrollment by type of aid program in each sector and level within each state?
    a. Each state
        i. 2-year public
        ii. 2-year private
        iii. 4-year public
        iv. 4-year private

Limitations of the Study

The following outlines some of the limitations of this study.

- Aggregate and self reported data—the aggregate participation data that were used in this study were collected from the National Center for Education Statistics' IPEDS data set. As such, the data are self-reported by the institutions in each state and can be incomplete or omit institutions that are in the states selected for this study.
- Self selection—as in almost all studies that involve higher education, participation was not compulsory and therefore reflects a self-selecting sample of the larger population. As such, care must be taken when attempting to generalize to the whole population.
- Autocorrelation—there is a high correlation between current freshmen enrollment and enrollment in the higher levels. In most states there has been an increase in the number of students that are enrolling in postsecondary education over the past 20 years (Mortenson, 2006). This increasing trend toward enrollment can lead to autocorrelation in enrollment from one year to the next. The first way this study limits the effects of this autocorrelation is to limit the study to the impact of first time undergraduates only. A test that is used to determine if there is autocorrelation is to check the Durbin-Watson statistic for each model that was developed from the time series regression equations, which is fully explained in Chapter 3 (Meier and Brudney, 2002).
- Alternative explanations—an assumption of this study was that the change in enrollment at the time of the policy implementation was due to the policy

effects rather than some other explanation. Alternative explanations for increased enrollment can be ruled out by increasing the number of cases, which is why this study examines similar programs across several states. In addition, by looking at the effects of the policy across institutional sectors and levels in several states, the number of cases is increased to a point where outliers can be identified and explained.

- This study does not differentiate between those students who are residents of merit aid states versus those who are not; it was a broad examination of the impact of the policy adoption on all first time undergraduate enrollments across the state.
- Multicollinearity- due to the nature of time series analysis and the use of dummy variables, there were instances where multicollinearity was an issue. For example, both the long term impact (TTT) and time (T) trend variables were used to determine trends and used counting variables that overlapped in their measures. Another example is the high level of correlation between the other independent variables, such as the number of high school graduates (HSGRAD) and higher education appropriations (HEAPP).

Once a person determines that he or she wants to participate in higher education, they face the task of selecting an institution and getting accepted. At each stage of the process between determining that one wants to go to college and getting in the chair on the first day of class, there are factors that weigh into the decisions along that path. The college choice, participation, enrollment, matriculation, and participation literature has identified several of those factors: parent attainment, socioeconomic status, gender,

race/ethnicity, financial aid, self efficacy, grade point average, standardized test scores, and tuition, (Cabrera & La Nasa, 2000; Leslie & Brinkman, 1988; St. John, 1990) to name just a few. While this study is about financial aid, which is one factor of many in the decision to enroll, this study does not take into account those individual differences that can play a role in a person's decision to enroll. As such, caution should be used when trying to generalize this study and its results to the decision of a single person.

Since the merit aid in states can only to be used in not for-profit postsecondary institutions, this study examines only the non-profit sector of higher education in the United States.

- Van der Klaauw (2002) theorizes that college administrators have little knowledge about the alternative enticements that are available to students. These alternatives can include campus job opportunities, special programming, financial aid offers from other institutions, military, external job opportunities, and a host of other omitted variables that may play a role in enrollment decisions. He argues that since financial aid is a part of the enrollment decision process, it is an endogenous, or nested, variable. In this study, each of the states' postsecondary financial aid is awarded to students based on a given set of criterion that students are generally aware of ahead of time and they can determine for themselves whether or not they qualify for merit for aid. While this study does not control for institutional or federal financial aid, the impact of state aid on enrollment is reasonably isolated by examining only similar state financial aid programs.

Definition of Terms

For the purposes of this study, the following definitions are for clarity and to ensure a common understanding of terms:

College choice: The decision process and conclusion concerning where one should matriculate.

College selection: Part of the decision process where a student candidate chooses to enroll from among a variety of institutions.

Enrollment: The measure for postsecondary participation, also referred to as 'demand' as represented by those choosing to enroll in postsecondary education (Buss, Parker, & Rivenburg, 2004).

Integrated Postsecondary Education Data System (IPEDS): A national database on postsecondary education that is housed at the National Center for Education Statistics. They are institutionally reported data that contain enrollment information.

Level: Describes whether a postsecondary institution offers 2-year, 4-year or technical degree programs.

Matriculation: The act of being enrolled as a student in a postsecondary educational institution.

Merit-based aid: In this case, it refers to state supported student financial aid whose primary criterion for award is merit rather than need.

Participation gap: The difference between the enrollment at the current rate (baseline rate) and enrollment at some higher rate set by the benchmark states (Martinez, 2004).

Participation rate: "the number of students in postsecondary education divided by the total population" (Martinez, 2004).

Postsecondary participation: Refers to a person attending a public or private degree-granting college or university (Census, 2000).

Sector: Refers to either public or private nonprofit postsecondary institutions

Factors of merit aid programs: The three main factors of merit aid programs are award criteria for selection, length of award, and amount of award.

Criteria for selection: Refers to the criteria used to determine award eligibility, typically grade point average, standardized test score, or class rank.

Length of award: Refers to the length of time of the award (semesters).

Amount of award: Refers to the award dollar amount per year.

Categories of merit aid programs: Refers to the broad categorization of merit aid programs by award amount (either full tuition, partial, or one-time payment).

Full tuition payment programs: Refers to merit aid student financial aid programs that pay for all postsecondary tuition expenses.

Partial tuition payment programs: Refers to merit-based student financial aid programs that pay a recurring award for some portion less than 100% of postsecondary tuition expenses.

One-time payment programs: Merit aid programs that make a one time payment to students for their performance.

CHAPTER 2

LITERATURE REVIEW

This chapter is a review the literature on student financial aid and postsecondary participation. State merit aid is the focus of this study and the literature review. The initial introduction to the broad issues that underlie financial aid is followed by a brief history of student financial aid in the United States. While this study focuses on state merit aid programs and their impact on enrollment, it is also important to understand both federal and institutional financial aid structures. In addition to providing a fuller understanding of the existing structures, an understanding of federal and institutional financial aid programs provides context for the state merit aid program structures that are currently in place. The balance of the chapter reviews the current literature on state merit aid programs. Finally, a brief review of the public policy perspectives related to large scale state-wide intervention programs, such as the merit aid programs is provided.

Throughout the reviewed literature cited in this chapter, the underlying theme is the interaction between financial aid and its impact on participation. Where it is appropriate, the interaction between the aid and participation variables will be reviewed in the financial aid literature; where possible, the literature review on participation will be covered separately. Additional issues related to aid and participation, such as college choice, will be discussed as appropriate.

Student Financial Aid

There are several factors that influence the decision about whether or not a person will go to college. Several researchers (Hossler, Braxton, & Coopersmith, 1989; Hossler & Gallagher, 1987; Hossler, Schmit & Vesper, 1999; Kim, 2004; McDonough, 1997; Tierney, 1980) have found that financial aid plays a significant role in the choice of colleges for students. Cabrera and La Nasa (2000) proposed a model for the college choice processes that showed that several factors influence college choice. Among those factors were parental characteristics (such as education, income, and occupation, collegiate experiences, encouragement, and involvement), student characteristics (ability, qualifications, aspirations), and institutional or sector factors (such as availability of information, features of potential institutions, and cost of attendance and financial aid) (Cabrera & La Nasa, 2000). Of all of the factors identified as playing a role in student participation, institutions, governments, and administrators generally have broad influence over only two general areas of student participation in higher education—admissions and financial aid (Van der Klaauw, 2002). Perna and Titus (2004) add to the list of tools within the scope of higher education policy control—tuition, appropriations to institutions, and policies related to K-12 preparation for higher education.

Researchers typically examine state and federal financial aid as separate entities—the results of which have been mixed. The research on the impact of institutional financial aid has found that it has a significant effect on participation (Jackson, 1978; Lumina, 2003, 2004). Research on state aid has found that it has a significant impact on sectors of the college going population but the size of that impact is mixed, depending largely on the amount of award (Heller, 1999; Dynarski, 2000; Kane, 2003). The federal

financial aid research related to student participation has shown a negligible effect at best (Maag & Fitzpatrick, 2004; Dynarski, 2003; Heller, 1999). Further, most studies find that state financial aid plays a significant role in the decision making process of students (Heller, 1997; St. John, et al., 2004). The impact of state aid is particularly significant when examining students with low socioeconomic status (Alexander, 2001) or those of African American and Hispanic origins (Heller, 1997; Kim, 2004; Stewart & Post, 1990). In addition, Seftor and Turner (2002) found that the federal Pell grant played a significant effect on the enrollment of adults in higher education. There remain gaps in the literature concerning types of financial aid programs and their impact on participation. In addition, because state-wide merit based financial aid programs are relatively new policy instruments, there is little research available on their effectiveness or impact on student participation.

Brief History of Financial Aid in the United States

While there was institutional student aid grant in place a short seven years after the establishment of Harvard University, the first federal student aid program in the US was not established until nearly three hundred years later, in 1935. Under the WPA, the National Youth Administration (NYA) provided part time jobs for over 700,000 college students. This initiative was started as part of the New Deal with the intention of providing jobs to youth during a time of economic depression. In its later years, it changed its focus to encompass job training for youth assisting in the war effort and was eventually abolished in 1943 (The Eleanor Roosevelt Papers).

Shortly after the abolition of the NYA, federal aid was extended to servicemen through the Serviceman's Readjustment Act of 1944, or GI Bill of Rights. This was the first large scale legislation that allocated money to individuals rather than institutions. Gladieux (2003) called the GI Bill "the most important education legislation of the 20th century in the US." In addition, he credits the GI Bill with inspiring efforts to broaden higher education access through subsequent legislation such as the Higher Education Act of 1965 and the Pell Grant, passed in the reauthorization of 1972.

Access continued as a goal throughout the 1970s on into the new millennium; however, student-financing policy shifted from grants to loans over the past 30 years (St. John, 1994). In 1974, the federal government established the Student Loan Marketing Association (Sallie Mae) and in 1976, the Reauthorization of the Higher Education Act provided for state loan-guarantee agencies—both of which would play a major role in the changing landscape of higher education finance for the next 30 years. The legislation of the 1990s provided enhanced access to loans for students and parents paying for higher education. The 1997 Taxpayer Relief Act provided for deductions to taxpayers for higher education interest on loans, provided for Lifelong Learning tax credits, Education IRAs, section 529 plans, Federal Hope Scholarship, and tax exclusions for employer paid contributions to education (FinAid, 2005).

One of the current issues in federal financial aid circles surrounds lending policies. It is of concern for many reasons. According to Gladieux and Perna (2005), lending has increased to nearly 50 percent of all entering freshmen and to nearly two-thirds of those entering four-year colleges. Perhaps most disturbing, nearly one-fifth of

those students drop out with significant loan debt and nearly one-fourth of borrowers who dropped out defaulted on at least one loan. (Gladieux & Perna, 2005).

Federal Student Financial Aid

There are three main ways in which the federal government provides financial aid to students: loans, grants, and work-study. According to Martinez (2005), studies on the impact of federal financial aid on participation focus primarily on two main questions: 1) Who participates? And 2) Where do they participate in higher education? These questions are intermingled in the research through various studies of choice, sector participation, and participation by race and gender. St. John (1991) conducted a review of the research literature and found that student aid programs are an effective mechanism for encouraging equal educational opportunity but that reductions in federal grant dollars have contributed to the participation gap of minority students to higher education. A more recent study by Ruppert (2003) supports the finding that there is a persistent gap in minority participation in higher education.

The impact of student financial aid on enrollment is mixed, largely because of the different types of aid that are available. Jackson's 1978 study of grant aid and student enrollment found that students "awarded $100 more aid were 0.1 percentage points more likely to attend than otherwise similar nonapplicants." He goes on to state that his data imply that, "the award of aid is more important than the amount," although he does warn against the generalizability of this finding to other students who received dissimilar amounts of awards. Heller (1997, 1999) and Leslie and Brinkman (1988) confirmed that students respond to financial grant aid awards and tuition pricing and that the responses

vary by race and ethnicity. A more recent study by Dynarski (2001) on the elimination of the Social Security Student Benefits Program found that "offering $1,000 ($1997) of grant aid increases educational attainment by .20 years and the probability of attending college by five percentage points."

Using the National Postsecondary Education Student Aid Survey of 1986-87, St. John & Starkey (1995) found that certain types of grant aid were negatively associated with persistence for low-income students. In addition, they found that, "the amount of work study awarded was significantly and negatively associated with persistence by lower-middle-income students." St. John and Starkey argue that the cause may be that, "the average grant award was apparently insufficient relative to the average tuition charge facing the low-income student" (p. 173). Similarly, Spaulding (2003) found that at the University of Washington, federal student loans and federal work-study had a negative influence on the student's decision to enroll. This combination of federal student loans and work-study is referred to as "student self help." The reliance on these policies of "student self help" has disparate impact on low SES students, who are eligible for work-study programs. The benefits of work-study, as demonstrated by increased involvement on campus, retention and the like must be supported by additional grant funding rather than loans in order to encourage these students to persist through to graduation.

Institutional Student Financial Aid

The first recorded financial aid is a scholarship established by Lady Anne Radcliffe Mowlson in 1643 at Harvard University (FinAid, 2005). Since that time, institutional aid has grown to nearly $23 Billion, or nearly one quarter of all financial aid

granted to students (see Figure 1 below). One of the tools that institutions have to influence the composition of an incoming freshman class is the financial aid packages it has to offers students (Thistlethwaite, 1958; Epple, Romano, & Sieg, 2002; van der Klaauw, 2002). Typically institutional financial aid is used to get a subset of those admitted, especially those with the greatest academic ability, to enroll.

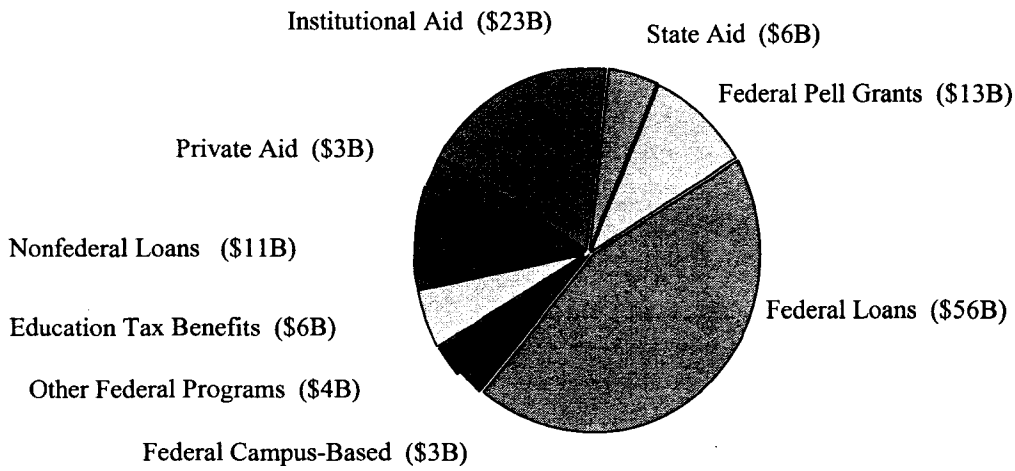
Private grants, scholarships, and loans are a category that is truly impossible to determine the full amount of private financial aid distributed nationally to students. Despite the gaps in the data on private grants, the Institute for Higher Education Policy conducted a survey to approximate the amounts given in the 2003-2004 academic year, and determined that somewhere around $3 billion, with estimates as low as a $450 million to as high as $13Billion (see Figure 1 below). The most recent NCES survey only had less than 600 respondents to the private grant question, of which they interviewed a sample (Institute for Higher Education Policy, 2005). To date, there is no comprehensive research on the number of private scholarships or the amount of the awards and their impact on access or participation in higher education.

Institutional Responses to State and Federal Aid

The limited numbers of studies that have accounted for the interactions between institutional, state and federal aid tend to focus on the institutional response to changes in either state or federal policies. For example, Acosta (2001) examined the response of colleges to changes in federal financial aid. She found that private institutions increased the amounts of their tuition and institutional aid to students, whereas public institutions increased tuition revenues and decreased student aid (Acosta, 2001). Similarly, Long

(2003) found that comparable institutional strategies to capture revenues were employed in Georgia with the implementation of the HOPE Scholarship.

Figure 1. Estimated Student Aid by Source for Academic Year 2003-04



Source: Institute for Higher Education Policy Survey, 2004-05; College Board, 2004

Research on the interaction between university policies and state merit aid policies has shown that institutions utilize awards to attract students with high academic achievement rather than closing the gap in need based financial aid left by statewide merit aid programs (Doyle, Delaney & Naughton, 2004). The implications of these findings for policy makers and administrators are significant. Both need to be fully aware of the impact of their policies on the entire student population and the compound affect it can have on students of low SES, who are most in need of financial aid.

State Merit Based Student Financial Aid

There are two main ways that states provide financial aid to students: through loans and through need and merit based grants. The impact of state aid is particularly significant when examining students with low SES (Alexander, 2001) or those of African American and Hispanic origins (Heller, 1997). All 17 of the states that have adopted broad-based merit scholarships have at least one of the following goals for its program: 1. promote college access and attainment, 2. encourage, and/or reward students for working hard, 3. reduce "brain drain" in the state by encouraging students to obtain their degrees in the state where they live (Heller, 2002). (See Appendix A for details on each of the states' awards).

Until the late 1980s, only a small proportion of state appropriations were allocated for merit-based funding to students (Cornwell, Mustard & Sridhar, 2003). The first merit based financial aid program was the Arkansas Academic Challenge Scholarship, introduced in 1991 by then Governor, Bill Clinton. However, since it's inception in the early 1990s, Georgia's Helping Outstanding Pupils Educationally (HOPE) Scholarship has led the way to increasing state supported broad-based merit scholarships.[1] According to a survey conducted by the Education Commission of the States, as of 2005, there were 17 states that had merit based scholarships similar to the one established by Georgia (see Appendix A for complete program descriptions). The transition from funding need-based scholarships to merit-based has been a relatively swift one, as it proves to be a politically popular tool used in election bids for legislators in this era of growing accountability

[1] Georgia has both a HOPE Scholarship and a HOPE Grant. The HOPE Grant applies only to non-degree programs and does not have a GPA requirement. Since the incentives that apply to merit aid do not apply to the HOPE Grant, this study does not examine that component of the Georgia Scholarship system.

(Dynarski, 2003). In 2000, the twelve states (at that time) with merit-based aid awarded over $863 million in merit based aid and $308 million in need based aid in the 2000-01 academic year (Heller, 2002).

The combination of eligibility requirements, source of funding, and award amounts in each state are the largest factors in determining the impact of each scholarship program. In a state where there is limited funding, it makes sense to have more stringent restrictions on who is awarded, in order to make the money last longer. A state might also reduce the amount of funding per student in order to stretch tight dollars. In states where the revenues are tied to state funding, such as in Louisiana and South Carolina, there is a larger impact on funding during years where state fiscal budgets are tight (Dynarski, 2002). States where lottery proceeds are the funding source, there is a disproportionate amount paid in to the fund and very little returned to low socioeconomic sectors of the state, which also generally tends to over-represent minorities (Binder, et.al., 2003; Cornwell & Mustard, 2003b). Arkansas has had to limit new enrollees and West Virginia had to cut need-based aid because it was based on the state's budget whereas the merit-based aid was based on lottery proceeds (Dynarski, 2003). A recent visit to the website for the Washington merit scholarship program revealed that the Washington Promise Scholarship program was terminated on June 30, 2006 (Washington Higher Education Coordinating Board, 2006).

Eligibility for the wide reaching merit based state scholarships vary widely from state to state. In Michigan, eligibility is solely based on a standardized test that is given in 11th grade. In Florida, Louisiana, Mississippi, and West Virginia, the criteria for award is based on grade point average and standardized test scores. Wyoming has the strictest

criteria for awards with both a high academic achievement requirement and high need criterion. As a result of their high eligibility requirements, Wyoming only awards between four and six awards annually. In Georgia, Kentucky, Nevada, and New Mexico recipients are awarded solely based on grade point averages. Finally, Alaska awards its scholars based on class rank. Basing awards on class rank is significant because "blacks have lower average grades in high school, which means a smaller proportion will meet HOPE's academic requirements: nationwide, among those members of the high school class of 1992 intending to go to college, 21 percent of whites had a high school GPA of 3.5 or above, while only 4 percent of blacks had such higher grades (National Center for Education Statistics, 1995)" (Dynarski, 2002).

The effect of award amounts has varied. In the case of Georgia, where the award is significant and includes not only tuition but student fees and books; the effect has been a significant shift towards students staying in state (Cornwell & Mustard, 2003b). Because Georgia's awards are based on lottery revenues, the state could, until recently, well afford to pay for tuition, fees and books for students. One study by Cornwell and Mustard (2002) theorized that due to the high correlation between pre-college academic achievement and family income, HOPE scholarship funds would be capitalized in other ways besides tuition. They found that "doubling any county's HOPE scholarship recipients would, on average, lead to a two percent rise in the number of registered cars" (Cornwell & Mustard, 2002).

In states where funding for the scholarship is limited, like Michigan, (which also uses tobacco settlement dollars), the total award is $2500. There has been little incentive effect in this state (Heller & Rogers, 2003); perhaps this is due in part because it is a one

time, non-renewable award. The Nevada Millennium Scholarship, with its funding base in the limited tobacco dollars, had to make adjustments in terms of requirements for awards and individual allotments during the 2005 legislative session (Ackerman, 2005). More recent legislative changes to the program cut funding to students taking remedial courses.

The results concerning the first goal of promoting college access and attainment have been mixed. Dynarski (2003) found that generally, the new merit-based scholarship programs increase participation in states by five to seven percentage points. On the other hand, she also found that in the case of Georgia's HOPE Scholarship, there was a widening of the participation gap between blacks and whites. She speculated it was due, at least in part, to the original stringent criteria placed on students in the HOPE Scholarship.

In New Mexico, where tuition prices are also low, Binder, Ganderton, and Hutchins (2003) found that the New Mexico Success Scholarship did not increase participation in that state for in-state students, but did increase participation for Native American students. They also found that the scholarship tended to disproportionately award white affluent students. In Nevada, early data indicate that the Nevada high school continuation rate for first-time, degree-seeking college students in the fall semester immediately following graduation increased from 32.4% in 1992 to 44.7% in 2002 (Herzog, 2005). While these numbers are encouraging for the future of Nevada, it remains below the 2002 national average of 56.6% for this age group (NCHEMS, 2005).

The final measure of impact of merit-based scholarships is that of "brain drain." While there is evidence that students tend to stay in their home state when incentives are

offered, such as in the case of Georgia's HOPE Scholarship (Cornwell & Mustard, 2002) there is little research into the long-term retention of these citizens. Heller and Rogers (2003) found that Michigan's $2500 incentive did little to provide encouragement for students to study harder, achieve more, or to pursue higher education in the state. They offer as a warning to policymakers that it is still not known how much of an incentive is necessary to retain students or how to focus incentives towards those students that might benefit from an incentive system of rewards.

While several studies focus on the impact of a specific merit aid policy, none have examined the aggregate impact of these policies in the states where they have been adopted. In addition, the operational definition of merit aid remains broad and indicates nothing more than the general criteria for award; this study seeks to deconstruct merit aid programs and to estimate the impact of three broad characterizations of merit aid on participation.

Postsecondary Participation

The pathway to college can take many different routes. For some, it includes years of planning, including taking college preparation coursework; for others, it is a decision that they make just before the start of a semester. This study is specifically interested in examining the patterns of enrollment across states and institutions as they are affected by merit-based aid and is not concerned about the process that students go through in deciding whether to go to college.

Throughout the literature, enrollment is referred to in many different ways. For example, within an economic framework, enrollment is referred to as 'demand', as

represented by those choosing to enroll in postsecondary education (Buss, Parker, & Rivenburg, 2004). Other literature equates college choice with opportunity and access, especially with regards to the long term impacts of where one decides to go to college and future career opportunities (Gladieux & Swail, 1999; Thomas, 2003). In her 2004 study on the impact of financial aid on college choice by racial groups, Kim (2004) found that the college choices of African American and Hispanic students were not significantly influenced by financial aid. However, Whites and Asian American students were more likely to enroll in their first choice college, given grants or loans or some combination of the two.

The impact of financial aid on college choice by sector has been examined in several studies (Jackson, 1978; Tierney, 1980; Perna & Titus, 2004). In their study on the impact of cost, quality, and enrollment demand, Buss, Parker, and Rivenburg (2004) found that increasing financial aid had a large positive effect on enrollment for students who receive that aid. However, if tuition also increased, student enrollment would decrease. "Students appear to look beyond a 'net cost' number and consider tuition and aid separately. Perhaps this reflects uncertainty about continuation of aid in future years, whereas 'tuition is forever" (p. 65). Jackson's 1978 study found that the mere offer of financial aid, regardless of amount, weighed significantly on the college choice decision. Perna and Titus (2004) found that, "state need-based financial aid and institutional financial aid promote student choice among different types of colleges and universities. State need-based financial aid programs with relatively large awards per member of the traditional college-age population appear to be particularly effective at promoting enrollment in private four-year colleges and universities in a state" (p. 520).

It is largely assumed that states that offer financial aid programs might improve their participation rates. Participation rates are "the number of students in postsecondary education divided by the total population" (Martinez, 2004). By investigating the relationship between merit aid and participation, it may be possible to predict how participation rates would be affected in the future. There has been some work done on projecting state participation rates. For example, in his study of postsecondary participation and state policy, Martinez (2004) proposed that states set benchmarks for improving their postsecondary participation rates based on the states with the highest participation rates. He found that if states maintained their current participation rates, the top five states with the largest projected gaps for 2015 were located in the Southeast. The participation gap is defined as the difference between the current college participation rate in the state and that of a benchmark state. There is growing concern that while the number of students enrolling in postsecondary education is increasing due to population growth, the percentage of the population enrolling in postsecondary education is not (Ruppert, 2003). Interestingly, four of the five states with the largest projected enrollment gaps currently have merit based student financial aid programs in place: West Virginia, Kentucky, Tennessee, and Mississippi. It may be possible that the effect of the merit aid programs in these states would alter the projections that Martinez offers.

There is an established body of literature that points to the relationship between financial aid and student enrollment; in particular, "who benefits?" and "where do they go?" The impact of merit aid policies has not been examined to determine how they effect first time undergraduate enrollment on the state and student levels. Additionally, there is little evidence as to the impact of merit aid on enrollment across the states with

similar policies to determine if the effect is similar. This study seeks to fill that gap in the research by examining the impact of merit aid on enrollment across similar merit aid policies at the state and sector levels.

CHAPTER 3

METHODOLOGY

Introduction

This chapter provides an overview of the analytical procedures used in this study and contains the following sections: Introduction, research questions, independent variable description, methods of analysis, and summary. First, an explanation of the methods that were used in this study, the sources of error for this type of analysis, and how the errors were controlled for are outlined. Then, the research questions and the corresponding hypotheses are provided. Drawn from the hypotheses, each of the dependent and independent variables utilized in the hypotheses are identified and defined. Finally, a description of each of the analyses that was conducted for each research questions is provided. Then, the four main types of impact found as a result of this type of analysis are examined. Finally, the regression equations and assumptions are presented along with data limitations.

Main Methods

The main methods of analysis that were utilized in this study are interrupted and pooled time series regression analysis. In addition, all regressions were checked for autocorrelation using the Durbin-Watson statistic. Interrupted time series is useful when examining a large scale policy adoption, such as the merit aid programs across states.

According to StatSoft, (2005), there are two main purposes in time series analysis: 1) "identifying the nature of the phenomenon represented by the sequence of observations, and (b) forecasting (predicting future values of the time series variable)".

Interrupted time series requires a series of observations of equal spacing before and after an event. The first step in interrupted time series is to graph the data to determine if there are any trends in the data line. Then, based on the visual inspection of the trend line, a regression model is built to determine the impact of the intervention or interruption (Meier & Brudney, 2002). Pooled time series is when there are a series of observations of equal spacing of equal units. For example, in this study, there were data for 1995-2004 reported for the institutions in Michigan. The data across all institutions in that state were pooled for each of every year and the multivariate regressions were run on the pooled enrollment data.

The data on enrollment in this study were likely to have a positive slope over time, as enrollments have generally been increasing in most states over the last 25 years (Mortenson, 2001). A concern when conducting time series analysis is that of autocorrelation (Ostrom, 1990). Autocorrelation is where data from one year are correlated with the prior years. For example, enrollment at institutions and in states is generally correlated from one year to the next simply because there are issues of population growth and capacity at work. In order to test for autocorrelation, the Durbin-Watson statistic for each regression was calculated. In order to reduce some of the autocorrelation, this study only examined the enrollment of first time undergraduates. By excluding sophomores, juniors, and seniors from the data set, the autocorrelation that corresponds with subsequent enrollments is reduced.

Sources of Error

McDowall, McCleary, Meidinger, and Hay (1980) point out that there are three main sources of error in time series: 1) trend; 2) seasonality; and 3) random error. Trend is where a time series gradually "drifts upward throughout most of its history" (McDowall, et al., p.15). Seasonality is when a series spikes consistently at a given interval of time. Finally, random error is when a "time series was detrended and deseasonalized, observations would still fluctuate randomly about some mean level" (McDowall, et al., p14). For this analysis, a time variable (T) was included to account for the trend component in this time series.

Pooled Time Series Analysis

For the pooled time series analysis, the impact of the type of merit aid program (full, partial, or one-time payment) across states with similar programs was examined. There were three intervention related dummy variables that were created for this study. The first is a time trend (T), which accounts for the increasing trend in enrollment over time, regardless of the policy adoption. The second is an intervention variable (TT) which examines the immediate impact of the policy adoption. A significant TT indicates that there was an immediate significant impact of the policy on enrollment. The third is a longitudinal trend counter (TTT) which examines the long term impact of the policy adoption. A significant TTT indicates that there was a significant long term impact of the policy adoption on enrollment.

A dummy variable for each of the states by program types (1= Yes, 0=No for each, One time payment, Partial tuition payment, Full tuition payment) was created.

Once the states have been assigned a code based on their merit aid program type, the data were aggregated into the three large program categories. Then the data across each condition separately were analyzed. The use of a dummy variable is recommended by the Least Squares Dummy Variable (LSDV) model, as suggested by Sayrs (1989) for studies with non-constant variation which is unique to each cross-section within the time series. There are legitimate concerns regarding the aggregation of data over units of analysis that are not comparable. However, the "pooled design will quickly reveal noncomparability because the disturbance vector will not fit a set of realistic assumptions about the data" (Sayrs, p. 16).

In his similar study of health reform policies across states, Stream (1999) used a pooled cross-sectional time series data set that was constructed to examine factors related to health reform across fifty states for a period of time to create a "state-year" variable. In this study, a similar pooled variable was created for the enrollment in each state for a given year, which served as the unit of analysis for research question 2, the state level pooled time series analyses. A second pooled variable was created for the enrollment in each sector in each state for a given year, which served as the unit of analysis for research question 4, the sector level pooled time series analysis.

Levels of Analysis

The analysis in this study took place in two main stages, according to the research questions. For the purposes of the dissertation, and in order to provide the reader with clarity as to how the research questions relate to specific data sets and methodologies, the

reader is referred to Appendix A, which outlines the datasets and methodologies in a matrix for ease of use.

State Level Analysis

1. How has merit aid impacted postsecondary participation in each of the states that has adopted this student financial aid policy?
2. What is the effect of the following three types of merit aid programs on state-level participation:
    a) Full-tuition programs
    b) Partial tuition programs
    c) One time payment programs

Sector Level Analysis

3. How much has merit aid impacted participation by sector and level in the states that have adopted this financial aid policy?
4. What is the effect of the following three types of merit aid programs on enrollment across similar programs by sector and level?
    a. Full tuition
        i. 2-year public
        ii. 2-year private
        iii. 4-year public
        iv. 4-year private
    b. Partial tuition
        i. 2-year public
        ii. 2-year private

iii. 4-year public

iv. 4-year private

c. One time payment

i. 2-year public

ii. 2-year private

iii. 4-year public

iv. 4-year private

Hypotheses

Hypotheses were written for the research questions to allow for a test of significant differences to a) compare participation before and after policy enactment of merit policies, and b) compare participation differences across the three different types of merit aid programs. The hypotheses for each of the questions are as follows:

1. How has merit aid impacted first time undergraduate postsecondary participation in each of the states that has adopted this student financial aid policy?

    - For each state,

        i. Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.

        ii. Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.

    - b_b is the slope of the line *before* policy adoption, which was calculated using regression analysis for the time series for each state separately

- b_a is the slope of the line *after* the policy adoption, which was be calculated using regression analysis for the line in the time series after the policy adoption for each state.

2. What is the effect of the following three types of merit aid programs on enrollment across similar programs:
    - Using pooled data for Full tuition programs
        i. Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.
        ii. Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.
    - Using pooled data for Partial tuition programs
        i. Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.
        ii. Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.
    - Using pooled data for One time payment programs
        i. Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.
        ii. Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.
    - b_b is the slope of the line *before* policy adoption for the pooled state level data which were calculated by aggregating the institutional data for each state and then compiling the states' data into program types. For the full tuition

programs, N=6, for the Partial tuition programs, N=6 and for the One time payment programs, N=1.

- b_a is the slope of the line *after* the policy adoption for the pooled state level data calculated by aggregating the institutional data for each state and then compiling the states' data into program types.

3. How has merit aid impacted participation by sector and level in the states that have adopted this financial aid policy?
    - Using pooled data for each state,
        i. 2-year public
            1. Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.
            2. Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.
        ii. 2-year private
            1. Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.
            2. Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.
        iii. 4-year public
            1. Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.
            2. Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.

iv. 4-year private

1. Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.
2. Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.

- b_b is the slope of the line *before* policy adoption for the pooled institutional level data which is calculated by aggregating the institutional data for each sector and level.
- b_a is the slope of the line *after* the policy adoption for the pooled institutional level data calculated by aggregating the institutional data for each state by sector and level.

4. What is the effect of the following three types of merit aid programs on enrollment across similar programs by sector and level?

- Full tuition

i. 2-year public

1. Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.
2. Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

ii. 2-year private

1. Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

2. Ha: $b_b\ b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

iii. 4-year public

1. Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.
2. Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

iv. 4-year private

1. Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.
2. Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

- Partial tuition

i. 2-year public

1. Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.
2. Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

ii. 2-year private

1. Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.
2. Ha: $b_b - b_a \neq 0$, the policy adoption did not have a significant effect on enrollment.

iii. 4-year public

1. Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.
2. Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

iv. 4-year private

1. Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.
2. Ha: $b_b - b_a \neq 0$

- One time payment

i. 2-year public

1. Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment
2. Ha: $b_b - b_a \neq 0$, the policy adoption did not have a significant effect on enrollment

ii. 2-year private

1. Ho: $b_b - b_a = 0$ the policy adoption did not have a significant effect on enrollment.
2. Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

iii. 4-year public

1. Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

2. Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment

iv. 4-year private

1. Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.
2. Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

- where b_b is the slope of the line before policy adoption and b_a is the slope of the line after the policy adoption.

Description of Analyses

In the first part of this study, which addresses research questions 1 and 2, this research examines the impact of merit aid policies on enrollment of postsecondary students on a broad state level. The second part of this study, research questions 3 and 4, utilize institutional level data, to facilitate analyses of the data by sector (private/public) and level (2 and 4-year). The analysis examined comparisons within sectors and levels for the same states, but it also examined comparisons by sector and level across states with similar aid programs to see if similarities in enrollment changes occurred before and after policy adoptions.

First, a pooled time series analysis of enrollment for each of the merit aid states was separately conducted. Meyer (1995) argues that, "government policies often create natural treatment and comparison groups. Frequently, this event occurs because our federal system of government allows one state to change a policy while others do not.

The many cross-state differences in policies and changes in these policies allow the examination of a wide range of questions" (p. 158)

Merit aid policies provide a unique opportunity for higher education scholars to examine the impact of state level financial aid on participation at the state and institutional levels. Specifically, there are three main types of merit aid that these policies provide for examination: 1) One time payment, as in the case of Michigan; 2) Partial payment, as in the case of Missouri, Mississippi, and 3) Full tuition payment, as in the case of Georgia and Florida. For the second phase of analyses, the data were aggregated across states with similar aid types in order to examine the differential effects of each type of merit aid program.

The third step in this analysis examined how much merit aid impacted participation by sector and level in the states that have adopted this financial aid policy. This was done using time series analysis with institutional data that is aggregated by sector (private and public) and level (2-year and 4-year) within each state.

The fourth analysis was a time series analysis to determine the impact on enrollment by type of aid program in each sector and level across states with similar aid programs. As described earlier, this by compiling the institutional data for each of the states with similar aid types, plotting this data against time for each program type by sector and level, and then calculating a regression line for each sector.

Prior research suggests that students will go to the higher cost institution when their choice is on the margins (Dynarski, 2003). However, the magnitude of the impact has yet to be determined as well as if that impact is uniform across all types of merit aid programs. The analysis in this study provides regression equations that fit the data for the

observed trends in each of the states, merit aid program types, within sectors across states or sectors within a single state.

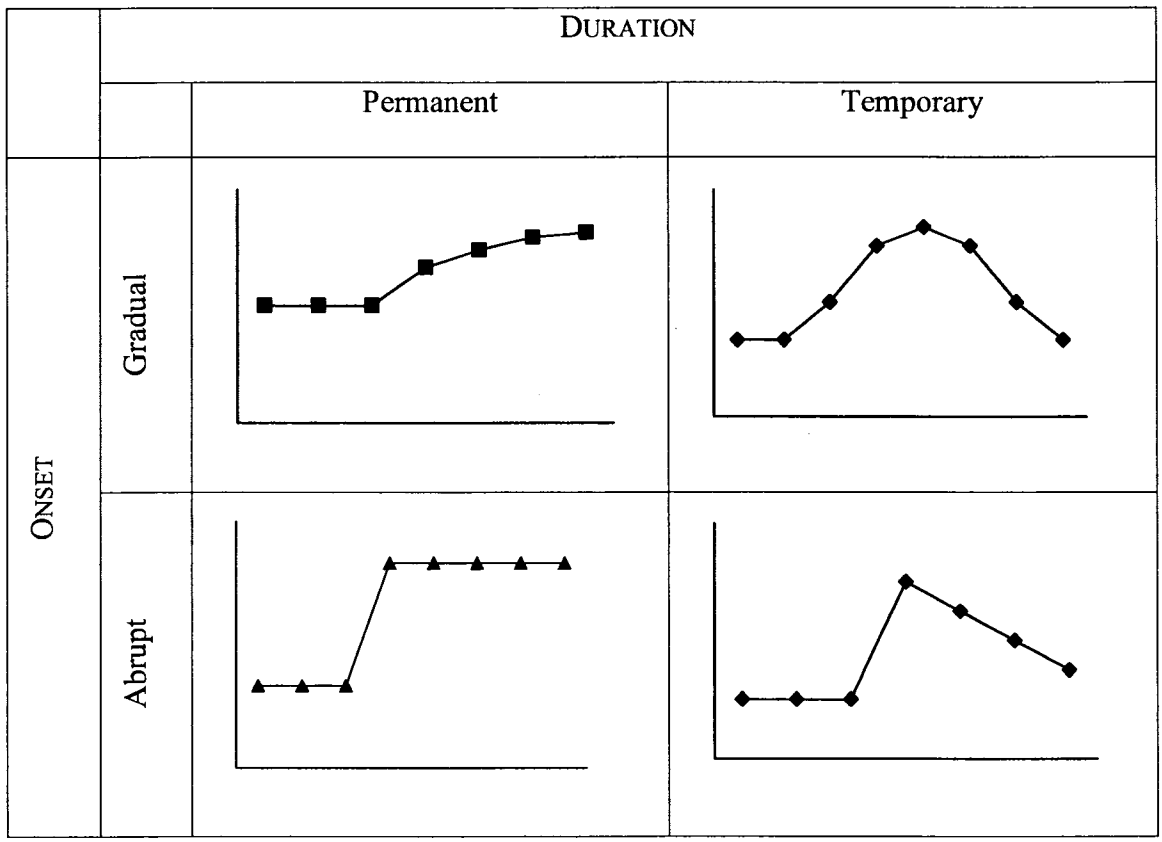
Impact Analysis

According to McDowall, et. al. (1980), in time series impact analysis, there are four main trends that emerge from the graphs (See Figure 2, below). The first pattern that may emerge is the gradual and permanent change in the trend. For this study, the change would be indicated by gradual change in enrollment after the adoption of a merit aid policy; that is, the slope and the intercept of the line changes gradually over time. The second is a gradual and temporary impact, which is indicated by a slow rise in the data line then a decline back to the pre-intervention state. The intercept changes and slope both change and then return back to their original state. The third impact is an abrupt initial impact and a permanent long term change, as indicated by a change in both the slope of the line as well as the intercept that remains over time. The fourth and final impact is an abrupt initial impact with a gradual return to the initial state.

If legislators are looking to merit aid to make a significant long-term impact on enrollment, they are likely going to want to see a permanent impact and most would probably prefer an abrupt change as well. The slope of the line is significant because it indicates the rate of participation in this study. As outlined earlier, Martinez (2004) determined the participation gaps across the states. The four of the five states with the most significant gaps in participation are merit aid states. If merit aid proves to be a useful tool in closing this gap, it could prove to be a successful strategy for other states

with significant participation gaps to utilize in an effort to raise the level of postsecondary participation in their states.

Figure 2. Impact Patterns



Source: McDowall, et. al. (1980)

Modeling Using Regression Analysis

The initial equations for the time series analysis were estimated to determine the impact of the award on enrollments in each of the merit aid states. The initial equation estimated for enrollment in each state (at both the state and sector/level of analysis) is:

$$Y_t = b_0 + b_1T + b_2TT + b_3TTT + b_4X_{HSGRAD} + b_5X_{HEAPP} + b_6X_{INSTTUIT} + b_7X_{UNEMP} + e_t$$

where Y_t = number of time-series observations for enrollment. T= a time counter from 1 to N, where N is the number of years observed for each state; so some states will have 7 years while others have 12, depending on how long ago the policy was adopted. TT = a dummy variable coded 0 for those years before the adoption of merit aid policy and 1 for the years after. This dummy variable is an indicator of when the state adopted the policy. TTT = a dummy variable coded 0 for the years before adoption and 1, 2, 3, ...for years after the adoption of the policy and serves as a counter for the number of years in which the policy is in effect; and e_t = the error term (Bingham & Felbinger, 2002). Additionally, HSGRAD = the number of public high school graduates in the state. HEAPP = the higher education appropriations in the state. INSTTUIT = average in state tuition. UNEMP = annual unemployment rate in the state. The independent control variables were selected based on previous work by Long (2003), where she investigated the impact of the HOPE merit aid policy adoption on these factors.

The assumptions for regression analysis apply to the use of regressions in time series analysis. The basic assumptions for regressions according to Lewis-Beck (1980) are: 1) No specification error, that is that the relationship between X_i and Y_i is linear and that no relevant independent variables have been excluded and no irrelevant independent variables have been included. 2) No measurement error, which is that the variables X_i and Y_i are accurately measured. 3) The following assumptions concern the error term, ε_t: zero mean $E(\varepsilon_i) = 0$. For each observation, the expected value of the error term is zero. Homoscedasticity $E(\varepsilon_i^2) = 6^2$. The variance of the error term is constant for all values of X_i. No autocorrelation: $E(\varepsilon_t\varepsilon_j) = 0$ $(i \neq j)$. The error terms are uncorrelated. The

independent variable is uncorrelated with the error terms E (εiXi) = 0. Normality. The error term, εc, is normally distributed" (p. 26).

Data

Prior to analysis, the researcher applied for permission to conduct research using secondary data on human subjects by the University of Nevada, Las Vegas, Office for the Protection of Research Subjects. Permission to conduct this research was granted on March 13, 2006. Exempt research review status was applied to this research because the National Center for Education Statistics' (NCES) Integrated Postsecondary Education Data System (IPEDS) was the source for the dependent variable, first time undergraduate student enrollment at an institutional level. The institutional participation for each of the 15 states (Alaska, Arkansas, Florida, Georgia, Kentucky, Louisiana, Michigan, Mississippi, Missouri, New Mexico, Nevada, South Carolina, Tennessee, Washington, and West Virginia) was downloaded for each year.

This study focuses on the analysis of the 12 states with more than five years of data since the policy adoption. However, data from Tennessee, Washington, and West Virginia were used also collected to provide an early indication of their enrollment response. In the case where institutional data were missing, the institutional outliers were noted and removed from the data set (see Appendix E for the removed institutions). For state level participation, the IPEDS institutional data for each state were compiled in order to calculate the state level participation rates for each year. For the sector level participation, the IPEDS institutional data for each sector in each state were compiled in order to calculate the sector's participation rates for each year. The data were limited by

selecting to examine the only the first time undergraduate population since merit aid applies to undergraduate students and initial enrollment.

The independent variables in this study were tuition (INSTTUIT), state higher education appropriations (HEAPP), number of public high school graduates (HSGRAD), annual unemployment rate (UNEMP), and three dummy variables that were coded to determine the impact of the merit aid policies on enrollment. The first dummy variable (T) was a time counter (1,2,3,...n); the second dummy variable (TT) was an indicator for when the program began, program = 0 before adoption, 1 after adoption; the third dummy variable (TTT) was a trend indicator where trend = 0 before adoption and 1,2,3,...n after adoption. The in-state undergraduate tuition data were downloaded at the same time as the enrollment data from IPEDS for each year.

For research question RQ1, the pooled annual average in-state resident tuition was calculated, which included two and four year private and public institutions. The state higher education appropriations were downloaded from the Illinois State University's Grapevine website for each year. The number of public high school graduates was retrieved from the Pell Institute and Tom Mortenson's Postsecondary OPPORTUNITY website. The annual unemployment rate for each state was downloaded from the Bureau of Labor Statistics (BLS) website.

There are three states that have adopted merit aid policies in the last three years: Tennessee, Washington, and West Virginia. The enrollment in these states served as a test for the regression equations developed out of the models for each of the merit aid programs. Additionally, South Carolina had two programs that were adopted within five years of each other; the latter was modeled after the Georgia HOPE and bears the same

name. The data for South Carolina was examined with both merit aid programs included in the analysis. All of the states selected for this study have at least five years of data post adoption of the merit aid policy. Additionally, programs that only serve 4-6 students, as in the case of Wyoming, were excluded because of the limited impact on participation.

Summary

This chapter presented the four main research questions along with hypotheses. Two of the research questions concerned the impact of the policy adoption at a state level and two at the sector level. There were 12 states that were fully examined in this study. An additional three states, West Virginia, Washington, and Tennessee, are briefly examined for initial impact since their policies have been adopted in the last five years.

Then, outlined the methods of this study, which used pooled and time series regression models to examine the impact of state merit aid scholarship programs on postsecondary enrollment. It also provided a detailed account of the impact analysis and subsequent analysis that took place in this study.

This chapter also presented a summary of all of the data that was used for this study and identified the sources for both the independent and dependent variables. Independent variables were selected from previous studies on merit aid and the dependent variable was selected based on eligibility from the initial phase of the adoption.

CHAPTER 4

STATE LEVEL ANALYSIS RESULTS

Introduction

Chapters 4 and 5 present the results of the statistical analysis of the research questions of this study. Chapter 4 contains the results of the state level analyses in research question RQ1 and RQ2. Chapter 5 contains the results of the sector level analyses in research questions RQ3 and RQ4. The purpose of this study was to examine the differential impact of the comprehensive state-wide merit scholarship programs across states, sectors and institutions. Both chapters 4 and 5, which present the results of this study, are organized by research question. The first two research questions are concerned with the impact of merit aid policies on a state level and are contained in chapter 4. Research question one (RQ1), how has merit aid impacted non-profit postsecondary participation in each of the states that has adopted this student financial aid policy? Research question two (RQ2), what is the effect of the following three types of merit aid programs on state-level participation: Full-tuition programs; Partial tuition programs; and One time payment programs.

For research question RQ1, analyses of the determinants of state level enrollment were conducted in each state using time series regression. Institutional enrollment data was compiled for each year and used as the state level enrollment figure in the analysis. Research question RQ2 was an analysis of the determinants of enrollment across states

with similar merit aid types using pooled time series analysis. This analysis was conducted in three stages. First, enrollment data of states with full tuition programs was pooled and analyzed, then states with partial tuition payment programs, and then the one state with one time payment program was analyzed using backward multiple regression analysis.

For all of the backward stepwise time series regression models, variables in the model that produced the smallest change in the r^2 and where the 'probability of F-to-remove $\geq$.10' no longer held were removed. The significant time series graphs and backward multiple regression analysis results are presented in this chapter. The graphs in this chapter are the time series for each state. The tables in this chapter include (a) the multiple correlation coefficients, *R*, (b) the coefficient of determination r squared or r^2, (c) adjusted r^2, (d) unstandardized coefficients B with standard error (Std.error), (e) standardized coefficients Beta, t-statistic, and (f) significance (Sig.). Summaries of all of the regression outputs for research question RQ1 can be found in Appendix B.

Finally, autocorrelation is a concern with time series analysis and therefore the Durbin-Watson statistic is calculated in this study as a test of autocorrelation. Only those Durbin-Watson statistics that were of concern because they were outside of the upper or lower limits of the statistic (given the degrees of freedom and number of cases) and demonstrated the existence of autocorrelation in the data are presented in this chapter. A complete table of the Durbin-Watson statistic outputs can be found in Appendix E. The analysis was performed using SPSS 13.0 for Windows.

Research Question 1

Research question 1: How has merit aid impacted first time undergraduate postsecondary participation in each of the states that has adopted this student financial aid policy?

For research question 1, each state is presented with the hypotheses, then a graph of the data, then the entry and final regression equations, then a table of the analysis with a summary description. For each state, the N = years of observations. For example, in Alaska, there were ten years of pooled enrollment data so N=10.

Alaska (AK)

The first hypothesis states that the slope of the regression line before the policy adoption was equal to the slope of the line after the intervention in each state. The alternative hypothesis is that the slopes are not equal. These hypotheses are represented by the equations:

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state

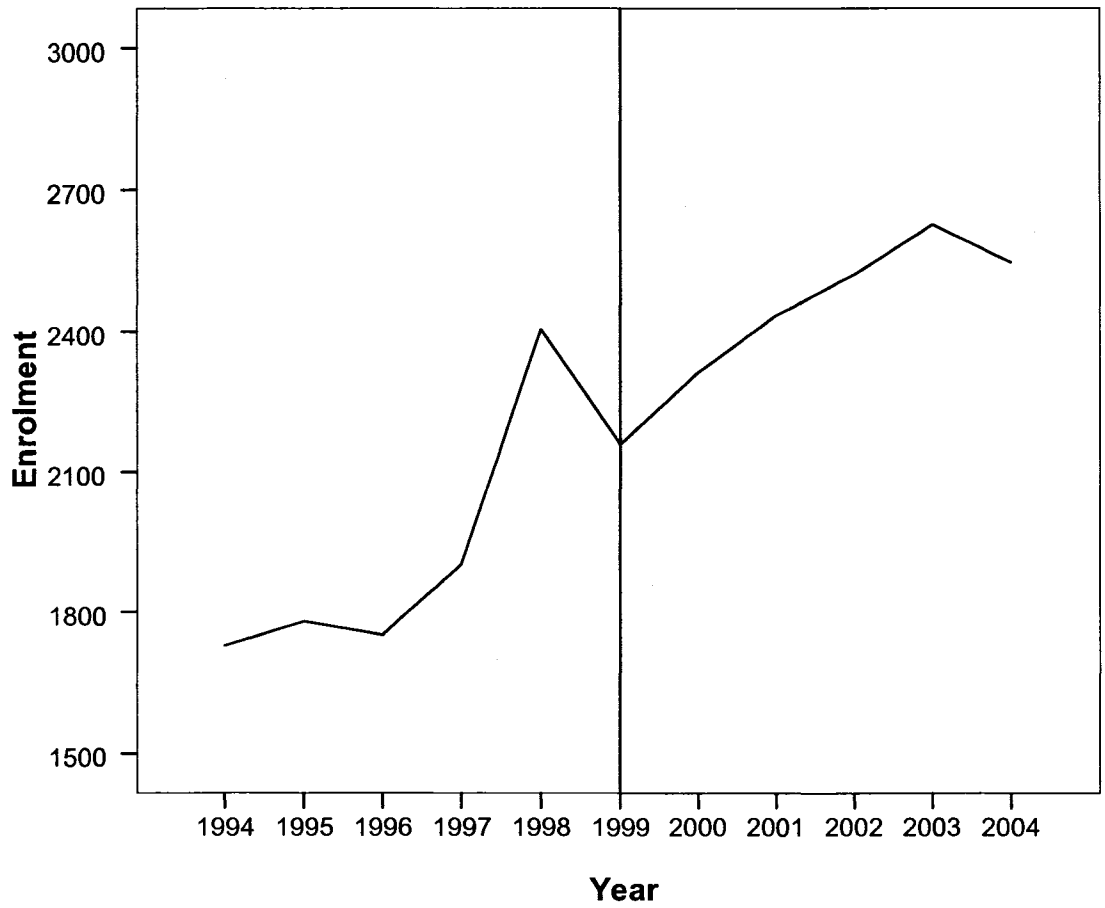
The entry and final regression models are:

Entry model: ENROLL = HEAPP + HSGRAD + INSTTUIT + T + TT + TTT + UNEMP

Final model: ENROLL = HSGRAD + TT + TTT +UNEMP + CONSTANT

Below is the graph of the time series for enrollment in Alaska, with an intervention line indicating the year of the policy adoption.

Figure 3. Annual Enrollment Pre- and Post- Merit Aid Adoption, Alaska



The significance of $F(4, 9) = 78.759$, $p<.001$ is well below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. More than 97 percent (adjusted $R^2 = .972$) of the variation in enrollment is explained by the number of high school graduates in the state, the short and long term impact of the policy adoption and unemployment. Approximately 2 percent of the variance is due to other factors other than those initial factors stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of unemployment, policy adoption, long term impact, and the number of high

school graduates. Since the short term impact (TT) and long term impact (TTT) is significant, the H_o is rejected.

Table 1

Regression Analysis Coefficients, Final Model for Alaska[a] (N=10)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	1421.056	860.275		1.652	.159
HSGRAD	.408	.102	.632	4.004	.010
TTT	169.223	34.581	.932	4.894	.004
TT	-476.621	95.716	-.728	-4.980	.004
UNEMP	-277.457	51.799	-.507	-5.356	.003

Note: R= .992, R Square = .984, Adjusted R Square = .972.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Arkansas (AR)

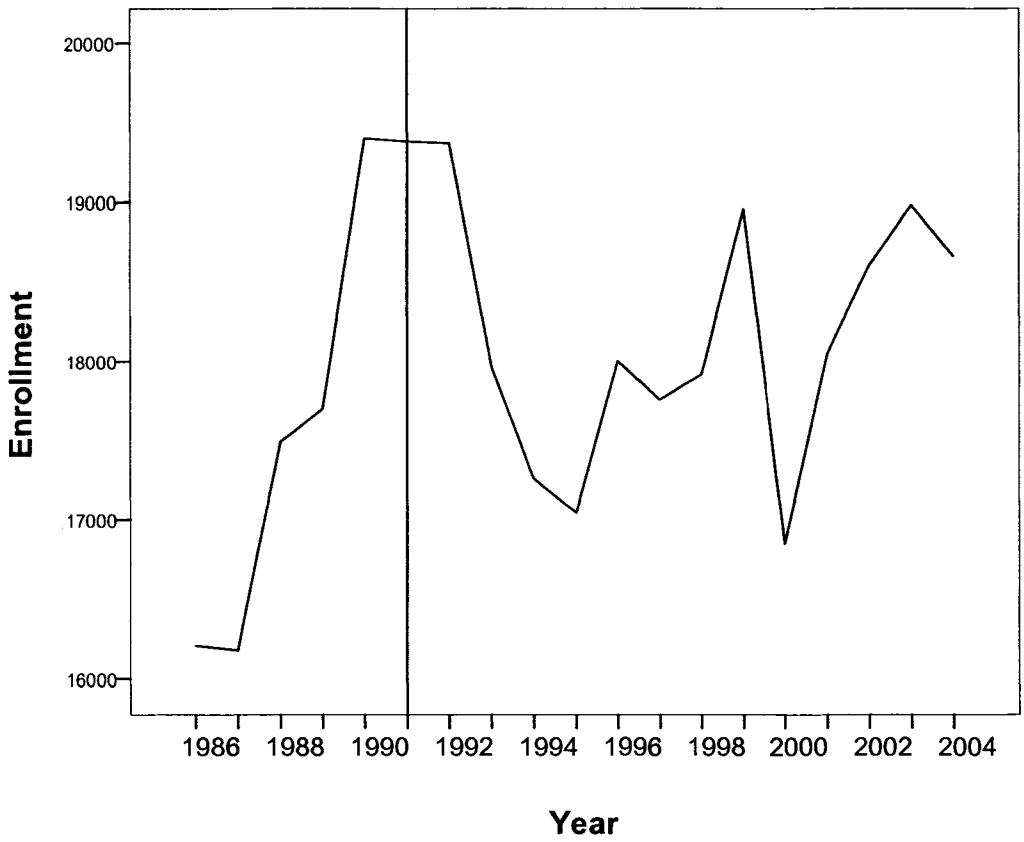
The first hypothesis states that the slope of the regression line before the policy adoption is equal to the slope of the line after the intervention in each state. The alternative hypothesis is that the slopes are not equal. These hypotheses are represented by the equations:

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.

Below is the graph of the time series for enrollment in Arkansas, with an intervention line indicating the year of the policy adoption.

Figure 4. Annual Enrollment Pre- and Post- Merit Aid Adoption, Arkansas



The entry and final regression models are:

Entry model: ENROLL=HEAPP + UNEMP + HSGRAD + INSTTUIT + T + TT + TTT

Final model: ENROLL = UNEMP + TTT + T + CONSTANT

The significance of $F(3, 18) = 16.786$, $p < .001$ is well below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 73 percent (adjusted $R^2 = .725$) of the variation in enrollment is explained by unemployment, time, and the long term impact of the policy adoption. Approximately 20 percent of the variance is due to other factors other than those initial factors stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of higher education appropriations, time, the long term impact of the policy adoption, and unemployment. Reject H_o since the long term (TTT) impact of the policy was significant.

Table 2

Regression Analysis Coefficients, Final Model for Arkansas[a] (N=19)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	7316.377	1802.698		4.059	.001
UNEMP	877.156	188.636	1.138	4.650	.000
T	1105.536	162.658	6.195	6.797	.000
TTT	-1019.994	163.838	-4.991	-6.226	.000

Note: R= .878, R Square = .770, Adjusted R Square = .725.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Florida (FL)

The first hypothesis states that the slope of the regression line before the policy adoption is equal to the slope of the line after the intervention in each state. The alternative hypothesis is that the slopes are not equal. These hypotheses are represented by the equations:

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.

The entry and final regression models are:

Entry model: ENROLL= HEAPP + UNEMP + HSGRAD + INSTTUIT + T + TT + TTT

Final model: ENROLL = HEAPP + HSGRAD + INSTTUIT + T + TT + TTT + CONSTANT

The significance of $F(6, 12) = 122.291$, $p<.001$ is well below the $\alpha \leq .05$. Table 3 provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. More than 98 percent (adjusted $R^2 = .984$) of the variation in enrollment is explained by the number of high school graduates, time, the adoption of the merit aid policy and its long term impact, in state tuition, and higher education appropriations. Approximately one percent of the variance is due to other factors other than those initial factors stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of higher education appropriations, the number of high school graduates, time, the short and long term impact of the policy

adoption, and in state tuition. Reject H_0 since the long (TTT) and short (TT) term impact of the policy adoption was significant.

Below is the graph of the time series for enrollment in Florida, with an intervention line indicating the year of the policy adoption.

Figure 5. Annual Enrollment Pre- and Post- Merit Aid Adoption, Florida

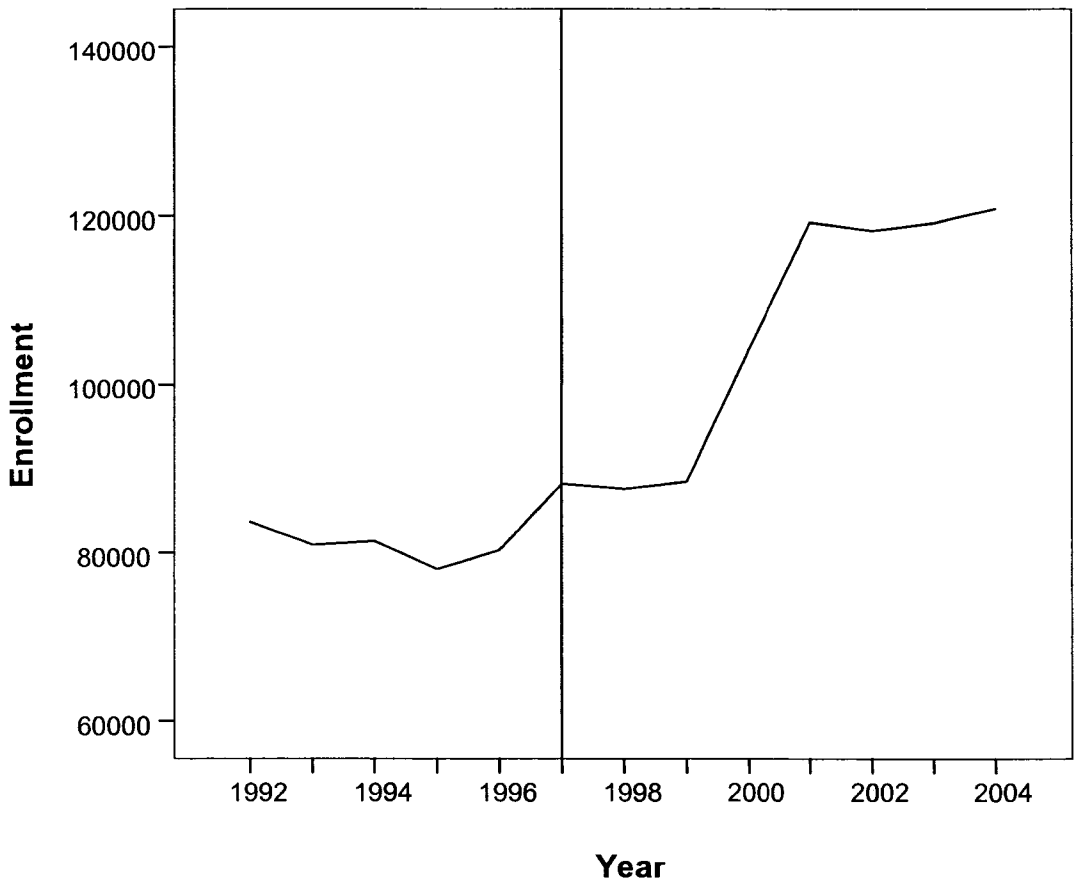


Table 3

Regression Analysis Coefficients, Final Model, for Florida[a] (N=13)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	392939.30	55295.696		7.106	.000
HEAPP	-4.12E-005	.000	-1.409	-5.058	.002
HSGRAD	-1.855	.492	-1.579	-3.772	.009
TTT	19572.050	3138.997	3.326	6.235	.001
TT	12585.582	3876.971	.367	3.246	.018
T	7898.025	1662.336	1.773	4.751	.003
INSTTUIT	-24.349	4.665	-1.564	-5.220	.002

Note: R= .996, R Square = .992, Adjusted R Square = .984.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Georgia (GA)

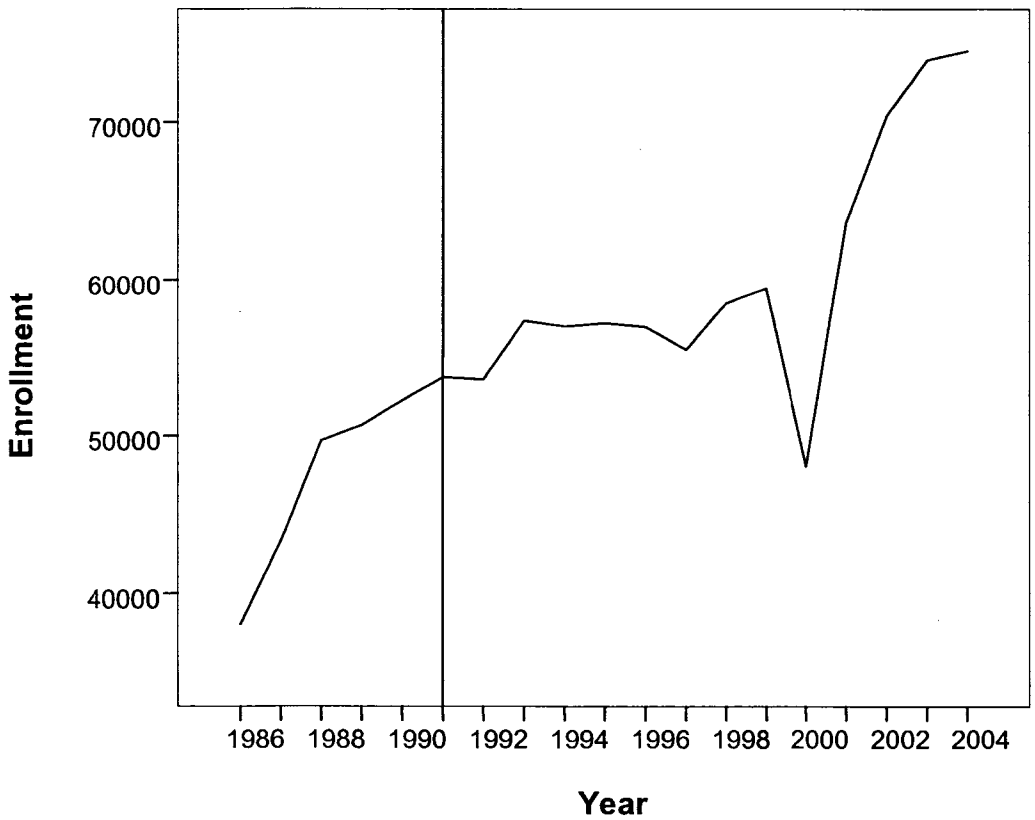
The first hypothesis states that the slope of the regression line before the policy adoption is equal to the slope of the line after the intervention in each state. The alternative hypothesis is that the slopes are not equal. These hypotheses are represented by the equations:

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.

Below is the graph of the time series for enrollment in Georgia, with an intervention line indicating the year of the policy adoption.

Figure 6. Annual Enrollment by Year Pre- and Post- Merit Aid Adoption, Georgia



The entry and final regression models are:

Entry model: ENROLL= HEAPP + UNEMP + HSGRAD + INSTTUIT + T + TT + TTT

Final model: ENROLL = UNEMP + T + CONSTANT

The significance of $F(2,18) = 37.621$, $p<.001$ is well below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard

error for the final model. Nearly 83 percent (adjusted $R^2 = .803$) of the variation in enrollment is explained by unemployment and time. Approximately 17 percent of the variance is due to other factors other than those initial factors stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the number of time (T) and unemployment (UNEMP). Accept H_0 since there was no significant long (TTT) or short (TT) term impact of the policy adoption.

Table 4

Regression Analysis Coefficients, Final Model, for Georgia[a] (N=19)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	12573.466	9927.583		1.267	.223
T	1878.085	230.509	1.126	8.148	.000
UNEMP	5088.554	1661.784	.423	3.062	.007

Note: R= .908, R Square = .825, Adjusted R Square = .803.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Kentucky (KY)

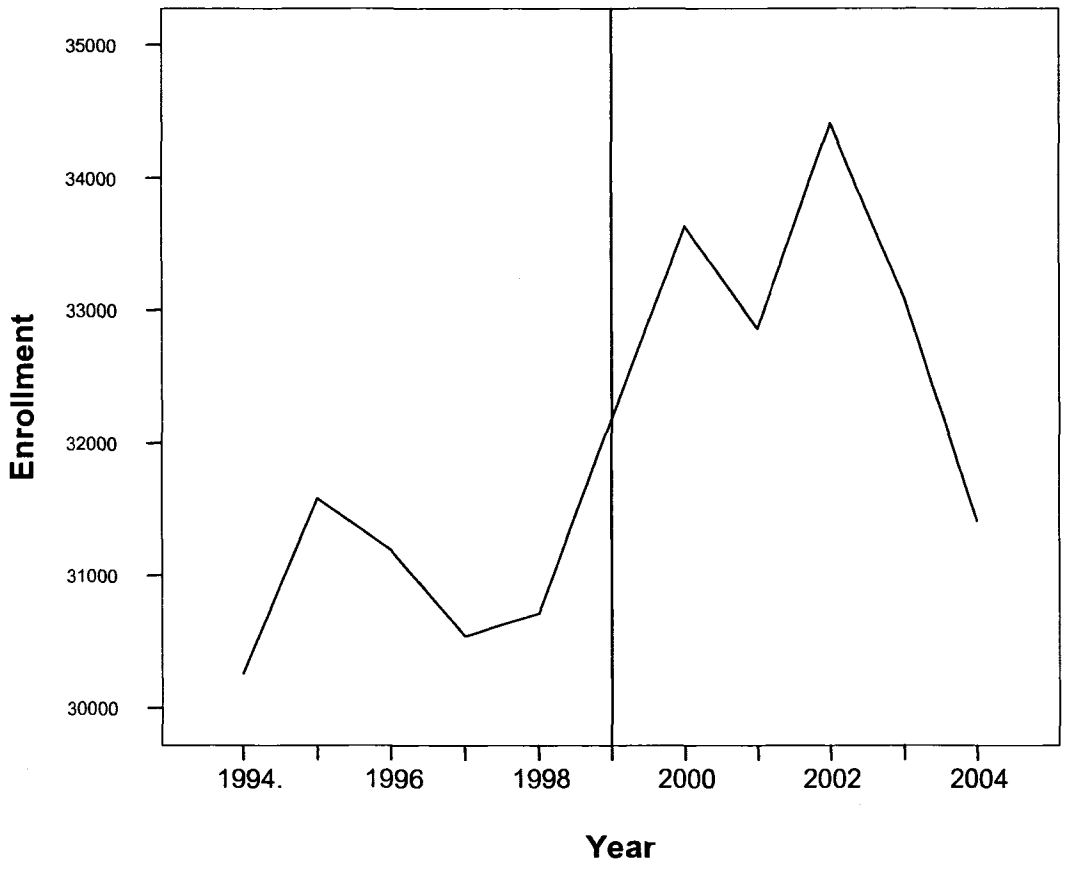
The first hypothesis states that the slope of the regression line before the policy adoption is equal to the slope of the line after the intervention in each state. The alternative hypothesis is that the slopes are not equal. These hypotheses are represented by the equations:

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.

Below is the graph of the time series for enrollment in Kentucky, with an intervention line indicating the year of the policy adoption.

Figure 7. Annual Enrollment by Year Pre- and Post- Merit Aid Adoption, Kentucky



The entry and final regression models are:

Entry model: ENROLL= HEAPP + UNEMP + HSGRAD + INSTTUIT + T + TT + TTT

Final model: ENROLL = INSTTUIT + T + TTT + CONSTANT

The significance of $F(5,10) = 10.530$, $p<.001$ is well below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. More than 78 percent (adjusted $R^2 = .782$) of the variation in enrollment is explained by the long term impact of the policy adoption (TTT), time (T), and the average in state tuition (INSTTUIT). Approximately 22 percent of the variance is due to other factors other than those initial factors stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of time (T), the long term impact (TTT) of the policy adoption and in state tuition (INSTTUIT).

Table 5

Regression Analysis Coefficients, Final Model, for Kentucky[a] (N=11)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	59559.338	6639.310		8.971	.000
TTT	2477.449	632.461	4.112	3.917	.006
T	1888.717	391.005	4.607	4.830	.002
INSTTUIT	-9.592	2.160	-7.981	-4.440	.003

Note: R= .921, R Square = .848, Adjusted R Square = .782.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Louisiana (LA)

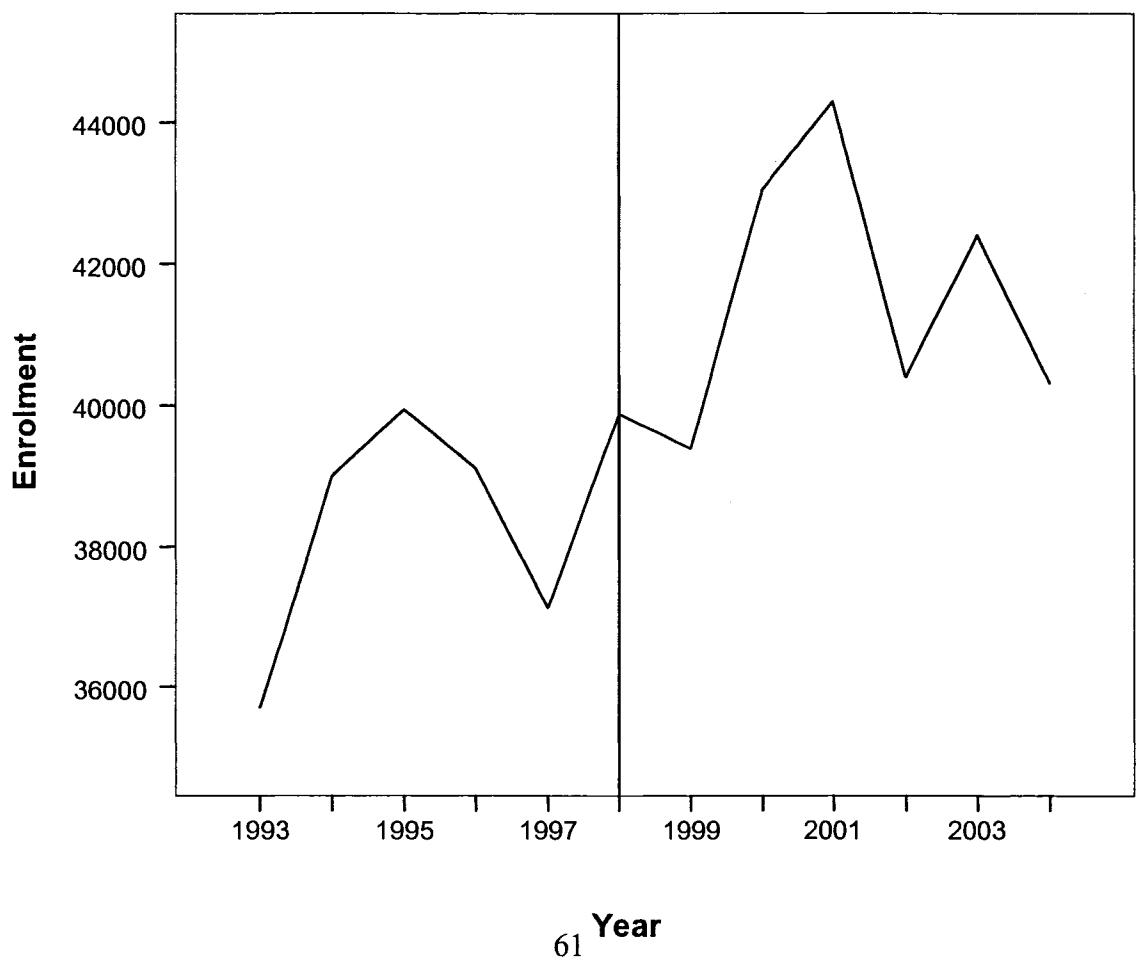
The first hypothesis states that the slope of the regression line before the policy adoption is equal to the slope of the line after the intervention in each state. The alternative hypothesis is that the slopes are not equal. These hypotheses are represented by the equations:

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment

Figure 8 is a graph of the time series for enrollment in Louisiana, with an intervention line indicating the year of the policy adoption.

Figure 8. Annual Enrollment by Year Pre- and Post- Merit Aid Adoption, Louisiana



The entry and final regression models are:

Entry model: ENROLL= HEAPP + UNEMP + HSGRAD + INSTTUIT + T + TT + TTT

Final model: ENROLL = HSGRAD + T + TTT + CONSTANT

Table 6

Regression Analysis Coefficients, Final Model, for Louisiana[a] (N=12)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-30150.46	18288.012		-1.649	.138
HSGRAD	2.031	.554	1.246	3.663	.006
TTT	1862.996	729.625	2.034	2.553	.034
T	-1382.392	633.329	-2.088	-2.183	.061

Note: R= .914, R Square = .835, Adjusted R Square = .740.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of $F(3, 11) = 10.576$, $p<.001$ is well below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Almost 74 percent (adjusted $R^2 = .740$) of the variation in enrollment is explained by the number of public high school graduates in the state (HSGRAD), the long term impact (TTT) of the policy adoption, and time (T). Approximately 26 percent of the variance is due to other factors other than those initial factors stepped out as not significant in this state. The standard coefficients (beta)

estimates relative predictive power of the number of high school graduates (HSGRAD), time (T), and the long term (TTT) impact of the policy adoption.

Michigan (MI)

The first hypothesis states that the slope of the regression line before the policy adoption is equal to the slope of the line after the intervention in each state. The alternative hypothesis is that the slopes are not equal. These hypotheses are represented by the equations:

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

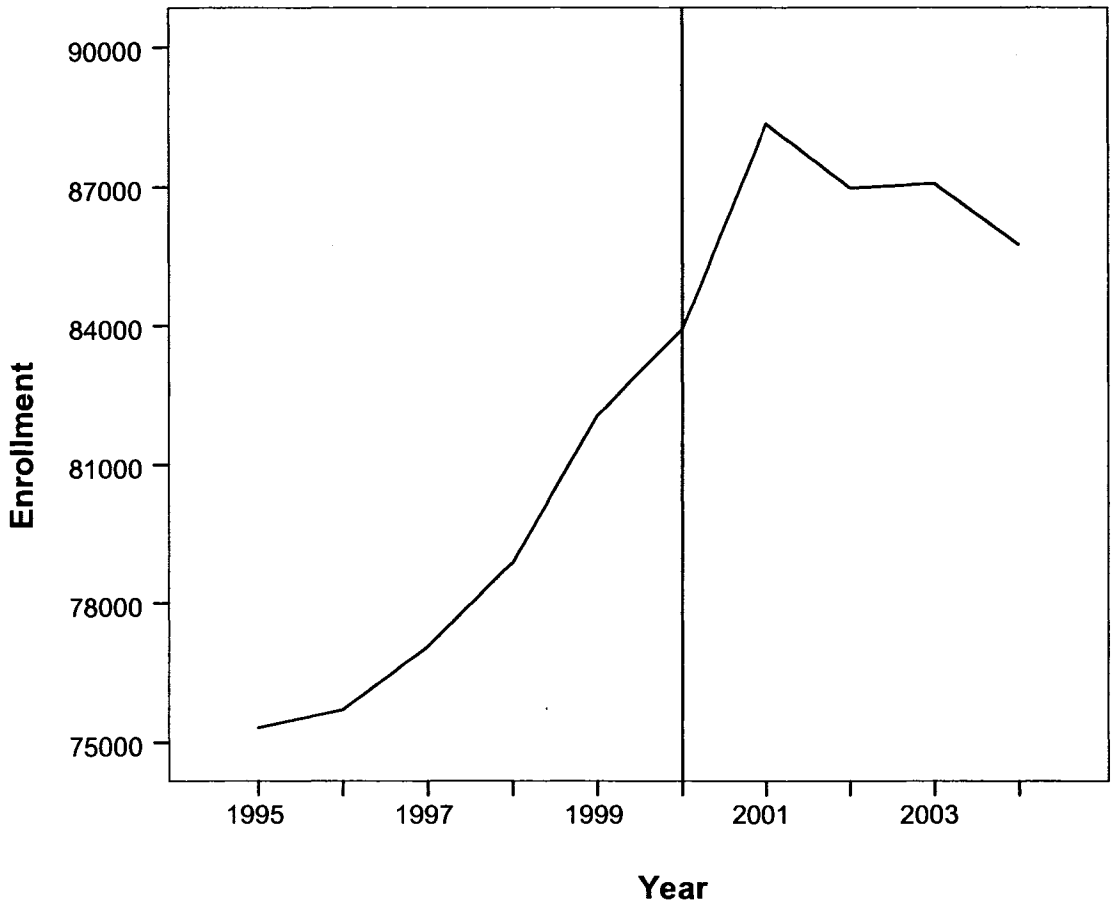
Since Michigan had only 10 cases and there were 7 independent variables that were in the entry model, the Durbin-Watson statistic showed that there was negative autocorrelation (DW= 3.577). In order to correct for this serial correlation, the researcher reduced the number of independent variables to include only those that would examine the impact of the policy adoption, time (T), program (TT), and long term impact (TTT). This reduction of the number of independent variables brought the Durbin-Watson statistic to within the acceptable range (DW=2.67). The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT

Final model: ENROLL = T + TT + TTT + CONSTANT

Figure 9 is the graph of the time series for enrollment in Michigan, with an intervention line indicating the year of the policy adoption.

Figure 9: Annual Enrollment by Year Pre- and Post- Merit Aid Adoption, Michigan



The significance of $F(3,9) = 32.194$, $p<.001$ is well below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. More than 91 percent (adjusted $R^2 = .912$) of the variation in enrollment is explained by the short (TT) and long (TTT) term impact of the policy adoption and time. Approximately 9 percent of the variance is due to other factors other than those initial factors stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of time and the short and long term impact of the policy adoption. Reject H_o since there was a significant long (TTT) and short (TT) term impact of the policy adoption on enrollment.

Table 7.

Regression Analysis Coefficients, Final Model, for Michigan[a] (N=10)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	72783.800	1560.781		46.633	.000
TT	4554.400	1940.305	.478	2.347	.057
T	1673.000	470.593	1.008	3.555	.012
TTT	-1426.400	665.519	-.543	-2.158	.074

Note: R= .970, R Square = .942, Adjusted R Square = .912.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Missouri (MO)

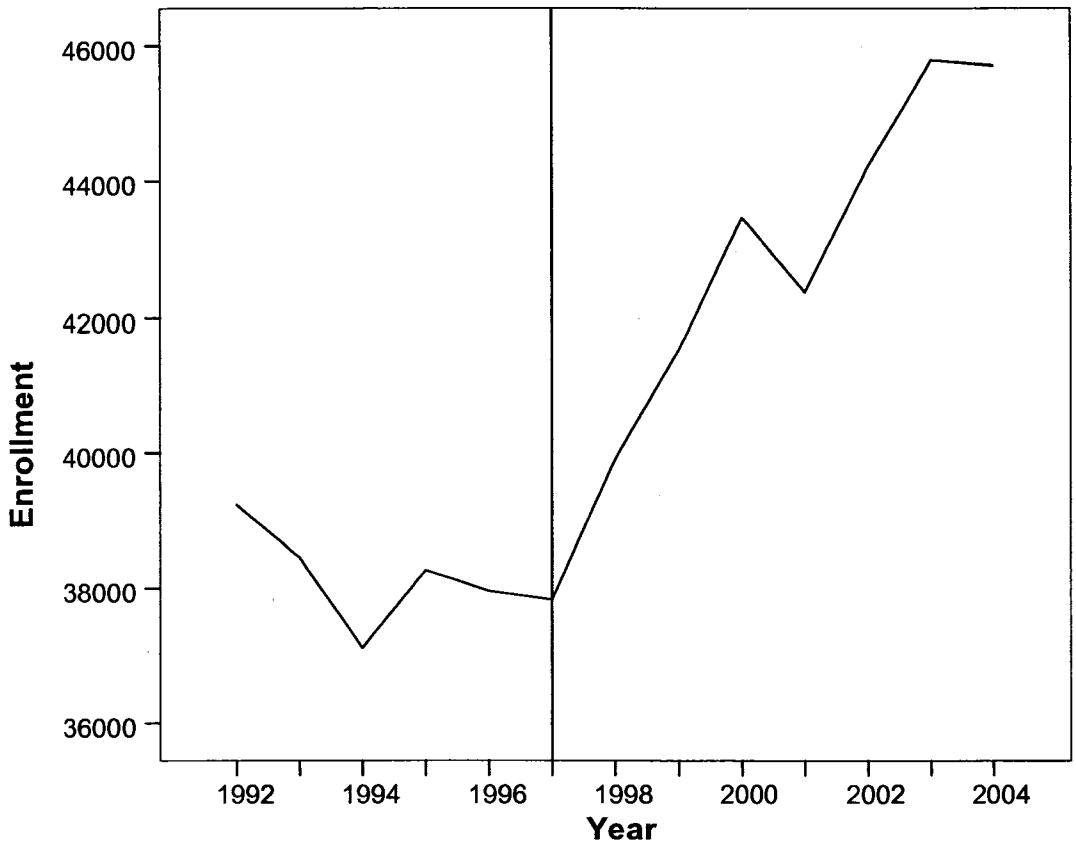
The first hypothesis states that the slope of the regression line before the policy adoption is equal to the slope of the line after the intervention in each state. The alternative hypothesis is that the slopes are not equal. These hypotheses are represented by the equations:

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.

Below is the graph of the time series for enrollment in Missouri, with an intervention line indicating the year of the policy adoption.

Figure 10. Annual Enrollment by Year Pre- and Post- Merit Aid Adoption, Missouri



The entry and final regression models are:

Entry model: ENROLL= HEAPP + UNEMP + HSGRAD + INSTTUIT + T + TT + TTT

Final model: ENROLL = TTT + CONSTANT

The significance of $F(1,12) = 166.096$, $p<.001$ is well below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. More than 93 percent (adjusted $R^2 = .932$) of the variation in enrollment is explained by the long term impact of the policy adoption. Approximately 7 percent of the variance is due to other factors other than those initial factors stepped out as not significant in this state. The standard coefficients (beta)

estimates relative predictive power of the long term impact (TTT) of the policy adoption. Reject H_o since there was a long term impact of the policy adoption.

Table 8

Regression Analysis Coefficients, Final Model, for Missouri[a] (N=13)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	38076.549	314.415		121.103	.000
TTT	1022.913	79.371	.968	12.888	.000

Note: R= .968, R Square = .938, Adjusted R Square = .932.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Mississippi (MS)

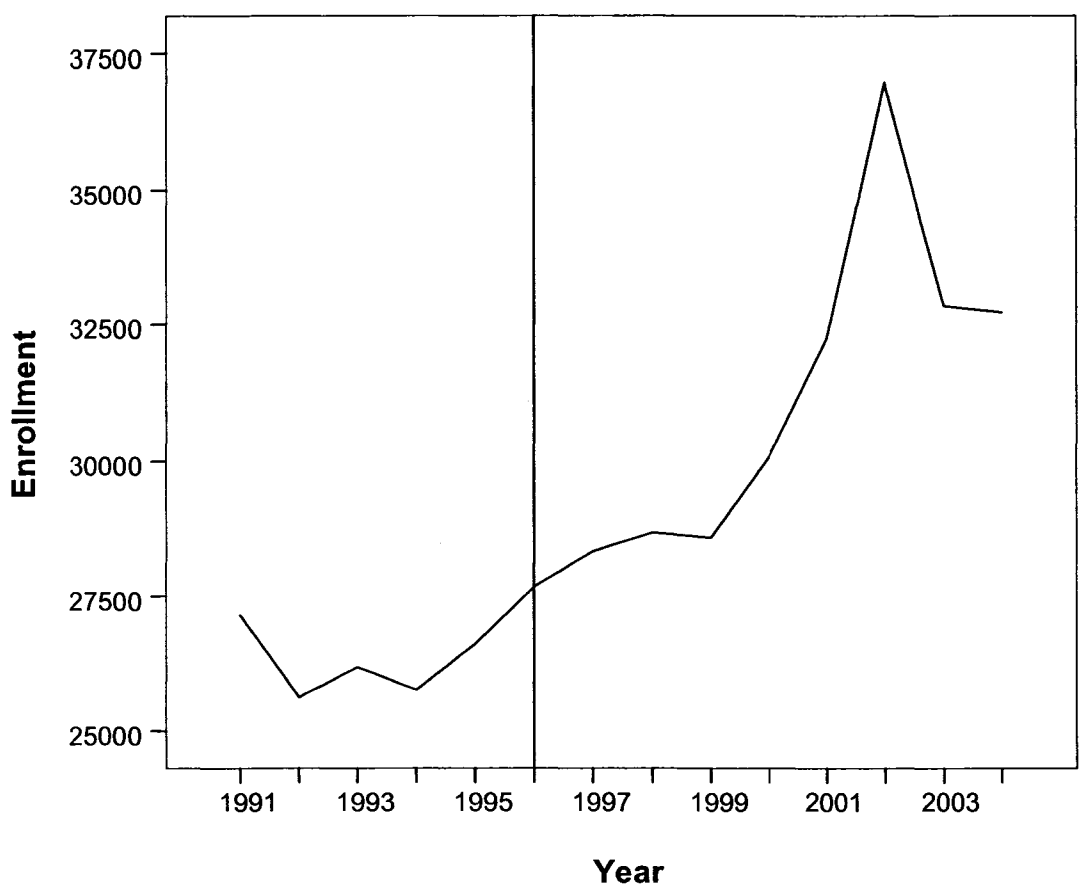
The first hypothesis states that the slope of the regression line before the policy adoption is equal to the slope of the line after the intervention in each state. The alternative hypothesis is that the slopes are not equal. These hypotheses are represented by the equations:

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.

Below is the graph of the time series for enrollment in Mississippi, with an intervention line indicating the year of the policy adoption.

Figure 11. Annual Enrollment by Year Pre- and Post- Merit Aid Adoption, Mississippi



The entry and final regression models are:

Entry model: ENROLL= HEAPP + UNEMP + HSGRAD + INSTTUIT + T + TT + TTT

Final model: ENROLL = UNEMP + T + CONSTANT

The significance of $F(2,13) = 32.069$, $p<.001$ is well below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 83 percent (adjusted $R^2 = .827$) of the variation in

enrollment is explained by time and unemployment. Approximately 17 percent of the variance is due to other factors other than those initial factors stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of time (T) and unemployment (UNEMP). Accept H_o, there was neither a long (TTT) nor a short (TT) term impact on enrollment after the policy adoption.

Table 9

Regression Analysis Coefficients, Final Model, for Mississippi[a] (N=14)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	13750.600	3840.165		3.581	.004
T	904.071	120.195	1.134	7.522	.000
UNEMP	1339.683	489.083	.413	2.739	.019

Note: R= .924, R Square = .854, Adjusted R Square = .827.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

New Mexico (NM)

The first hypothesis states that the slope of the regression line before the policy adoption is equal to the slope of the line after the intervention in each state. The alternative hypothesis is that the slopes are not equal. These hypotheses are represented by the equations:

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.

Below is the graph of the time series for enrollment in New Mexico, with an intervention line indicating the year of the policy adoption.

Figure 12. Annual Enrollment by Year Pre- and Post- Merit Aid Adoption, New Mexico

The entry and final regression models are:

Entry model: ENROLL= HEAPP + UNEMP + HSGRAD + INSTTUIT + T + TT + TTT

Final model: ENROLL = TTT + CONSTANT

The significance of $F(1,12) = 21.922$, $p<.001$ is well below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 64 percent (adjusted $R^2 = .635$) of the variation in enrollment is explained by the long term (TTT) impact of the policy adoption. Approximately 36 percent of the variance is due to other factors other than those initial factors stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the long term impact of the policy adoption. Reject H_o since there was a significant long term (TTT) effect of the policy adoption on enrollment.

Table 10

Regression Analysis Coefficients, Final Model, for New Mexico[a] (N=13)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	13610.248	206.906		65.780	.000
TTT	244.549	52.231	.816	4.682	.001

Note: R= .816, R Square = .666, Adjusted R Square = .635.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Nevada (NV)

The first hypothesis states that the slope of the regression line before the policy adoption is equal to the slope of the line after the intervention in each state. The alternative hypothesis is that the slopes are not equal. These hypotheses are represented by the equations:

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.

The entry and final regression models are:

Entry model: ENROLL= HEAPP + UNEMP + HSGRAD + INSTTUIT + T + TT + TTT

Final model: ENROLL = UNEMP + HEAPP + TT + INSTTUIT + CONSTANT

The significance of $F(4,9) = 18.063$, $p<.004$ is well below the $\alpha \leq .05$. The figure above provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 94 percent ($R^2 = .935$) of the variation in enrollment is explained by the unemployment rate in the state (UNEMP), higher education appropriations (HEAPP), the adoption of the policy (TT), and the average in state tuition (INSTTUIT). Approximately 6 percent of the variance is due to other factors other than those initial factors stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the number of unemployment rates (UNEMP), higher education appropriations (HEAPP), the policy adoption (TT), and instate tuition (INSTTUIT). Reject H_o since there is a significant short term impact (TT) of the policy adoption.

Figure 13 is the graph of the time series for enrollment in Nevada, with an intervention line indicating the year of the policy adoption.

Figure 13: Annual Enrollment by Year Pre- and Post- Merit Aid Adoption, Nevada

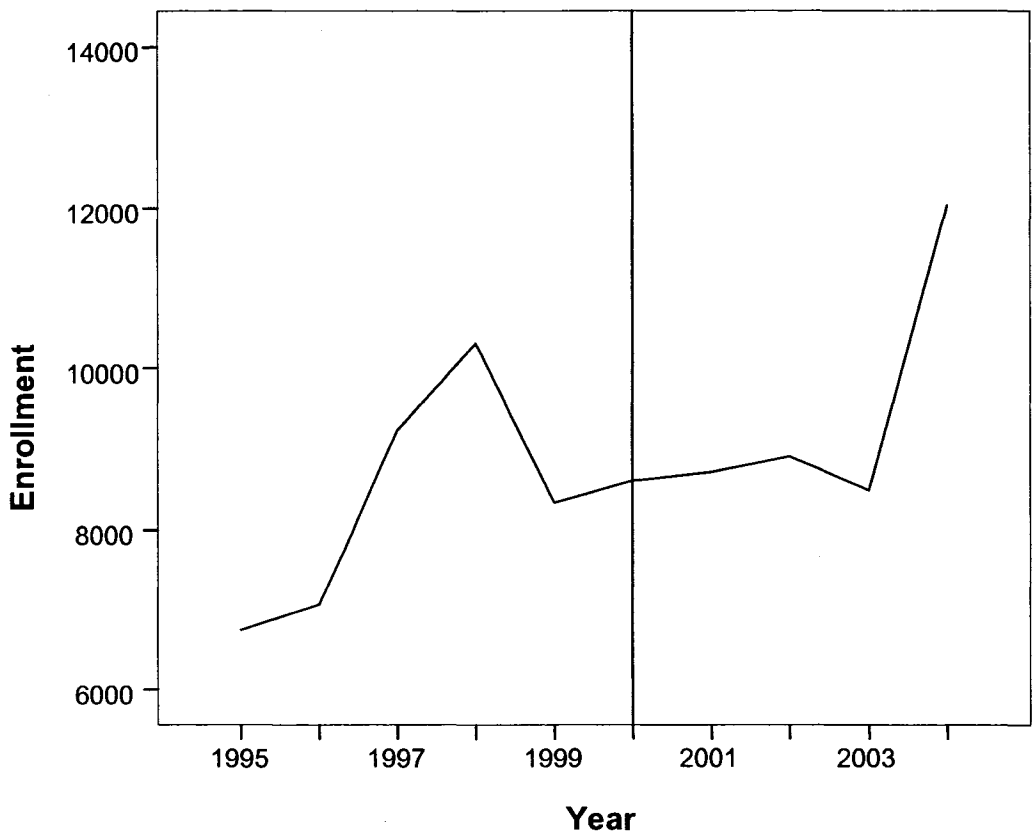


Table 11

Regression Analysis Coefficients, Final Model, for Nevada[a] (N=10)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	4645.729	2720.136		1.708	.148
HEAPP	-1.36E-005	.000	-.846	-2.195	.080
TT	-3295.486	912.725	-1.149	-3.611	.015
INSTTUIT	2.602	.582	2.550	4.475	.007
UNEMP	-1696.064	365.433	-.597	-4.641	.006

Note: R= .967, R Square = .935, Adjusted R Square = .883.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

South Carolina (SC)

Since South Carolina had two policies that were adopted, there are two analyses for this state. The first analysis is of the first policy adoption in 1998 and the second examines the impact of the second policy adoption in 2001. These hypotheses are represented by the equations:

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.

Figure 14 is the graph of the time series for enrollment in South Carolina, with an intervention line indicating the year of the first policy adoption.

Figure 14. Annual Enrollment by Year Pre- and Post- Merit Aid Adoption, South Carolina

The entry and final regression models are:

Entry model: ENROLL= HEAPP + UNEMP + HSGRAD + INSTTUIT + T + TT + TTT

Final model: ENROLL = UNEMP + T + CONSTANT

The significance of $F(2,11) = 69.580$, $p<.001$ is well below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 93 percent (adjusted $R^2 = .926$) of the variation in

enrollment is explained by time (T) and unemployment (UNEMP). Approximately 7 percent of the variance is due to other factors other than those initial factors stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of time (T) and unemployment (UNEMP). Accept H_0 since there was not a significant short (TT) or long (TTT) term impact of the policy adoption on enrollment.

Table 12

Regression Analysis Coefficients, Final Model, for South Carolina[a] (N=12)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	24137.218	1254.332		19.243	.000
T	816.957	73.633	.912	11.095	.000
UNEMP	772.613	214.761	.296	3.598	.006

Note: R= .969, R Square = .939, Adjusted R Square = .926.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The entry and final regression models are:

Entry model: ENROLL= HEAPP + UNEMP + HSGRAD + INSTTUIT + T + TT + TTT

Final model: ENROLL = HSGRAD + T + TTT + CONSTANT

The significance of $F(3,11) = 95.834$, $p<.001$ is well below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard

error for the final model. More than 96 percent (R^2 = .963) of the variation in enrollment is explained by the number of public high school graduates in the state, the impact of the policy adoption, and time. Almost 4 percent of the variance is due to other factors other than those initial factors stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the number of high school graduates (HSGRAD), time (T), and the immediate impact (TT) of the policy adoption. The second policy adoption had a significant positive impact on enrollment, reject H_o. Overall, enrollment was also significantly increasing as time went on.

Figure 15 is a graph for the second merit aid policy adoption in South Carolina,

Figure 15 Annual Enrollment by Year Pre- and Post- Merit Aid Adoption, South Carolina

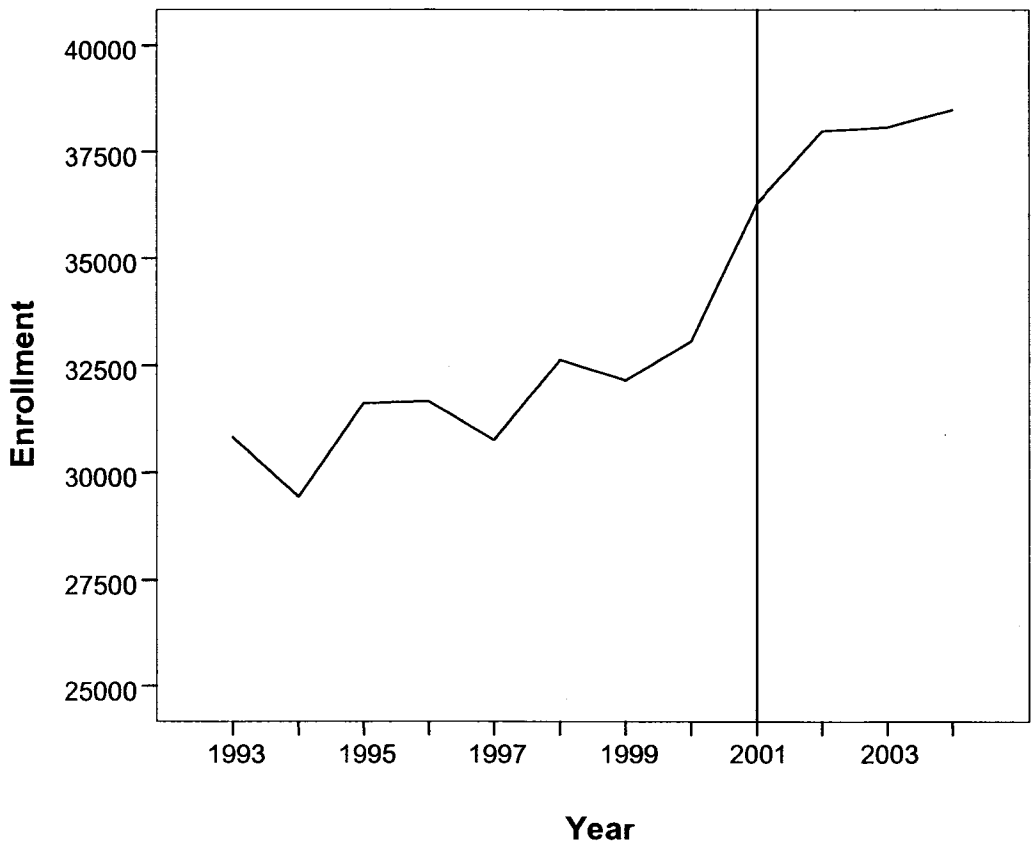


Table 13

Regression Analysis Coefficients, Final Model, for South Carolina[a] (N=12)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	14612.997	7821.373		1.868	.099
HSGRAD	.501	.259	.133	1.931	.090
TT	41.63.359	696.487	.635	5.978	.000
T	305.054	104.642	.341	2.915	.019

Note: R= .986, R Square = .973, Adjusted R Square = .963.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Tennessee (TN)

The first hypothesis states that the slope of the regression line before the policy adoption is equal to the slope of the line after the intervention in each state. The alternative hypothesis is that the slopes are not equal. These hypotheses are represented by the equations:

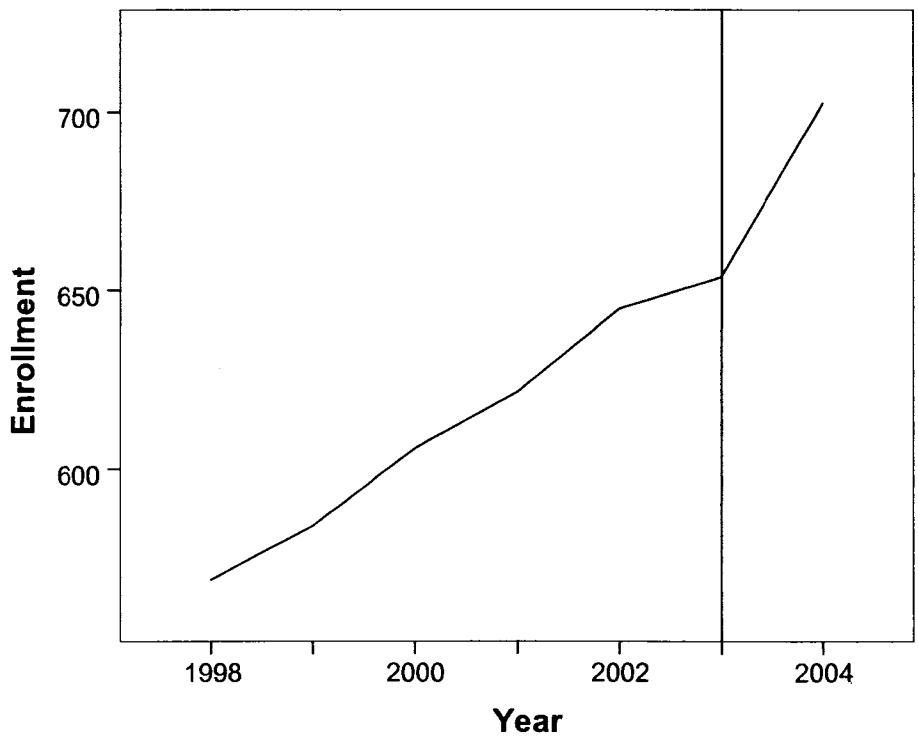
Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.

Figure 16 is the graph of the time series for enrollment in Tennessee, with an intervention line indicating the year of the policy adoption. One year of data post-policy

intervention are not a sufficient number of observations to run a time series regression; however the graph of the data are provided to give the reader a general impression of the impact of the policy on enrollment.

Figure 16. Annual Enrollment by Year Pre- and Post- Merit Aid Adoption, Tennessee



Washington (WA)

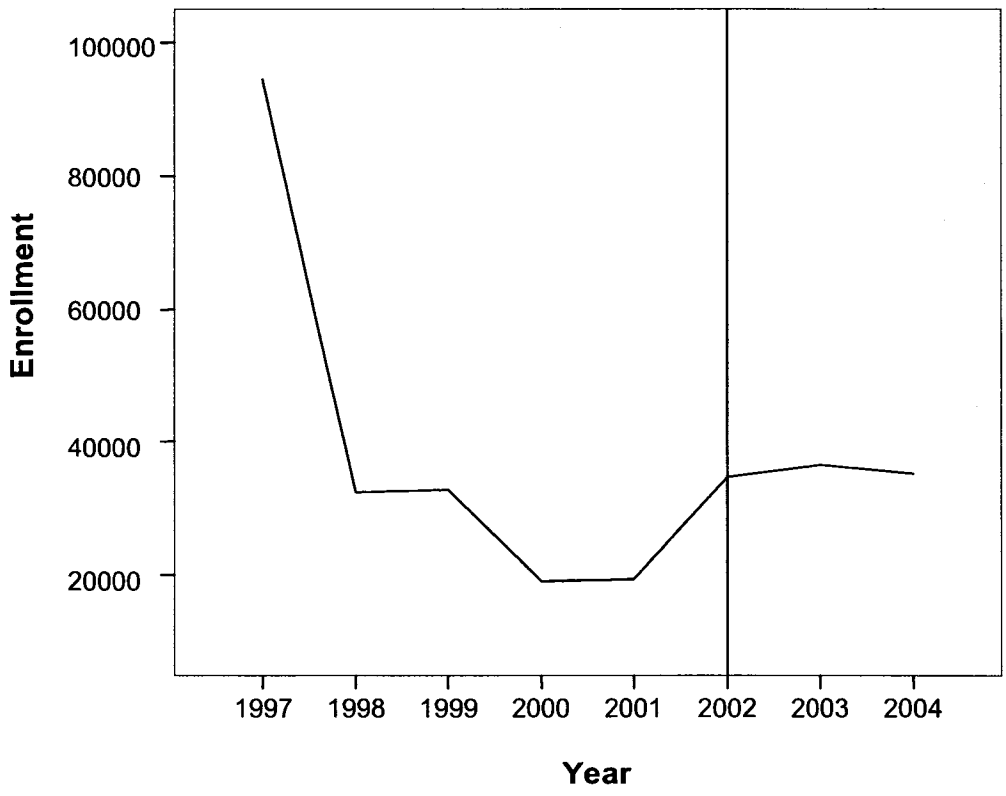
The first hypothesis states that the slope of the regression line before the policy adoption is equal to the slope of the line after the intervention in each state. The alternative hypothesis is that the slopes are not equal. These hypotheses are represented by the equations:

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.

Figure 17 is the graph of the time series for enrollment in Washington with an intervention line indicating the year of the policy adoption. Two years of data post-policy intervention are not a sufficient number of observations to run a time series regression; however, the graph of the data are provided to give the reader a general impression of the impact of the policy on enrollment.

Figure 17: Annual Enrollment by Year Pre- and Post- Merit Aid Adoption, Washington



West Virginia (WV)

The first hypothesis states that the slope of the regression line before the policy adoption is equal to the slope of the line after the intervention in each state. The alternative hypothesis is that the slopes are not equal. These hypotheses are represented by the equations:

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment in the state.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment in the state.

Figure 18. Annual Enrollment by Year Pre- and Post- Merit Aid Adoption, West Virginia

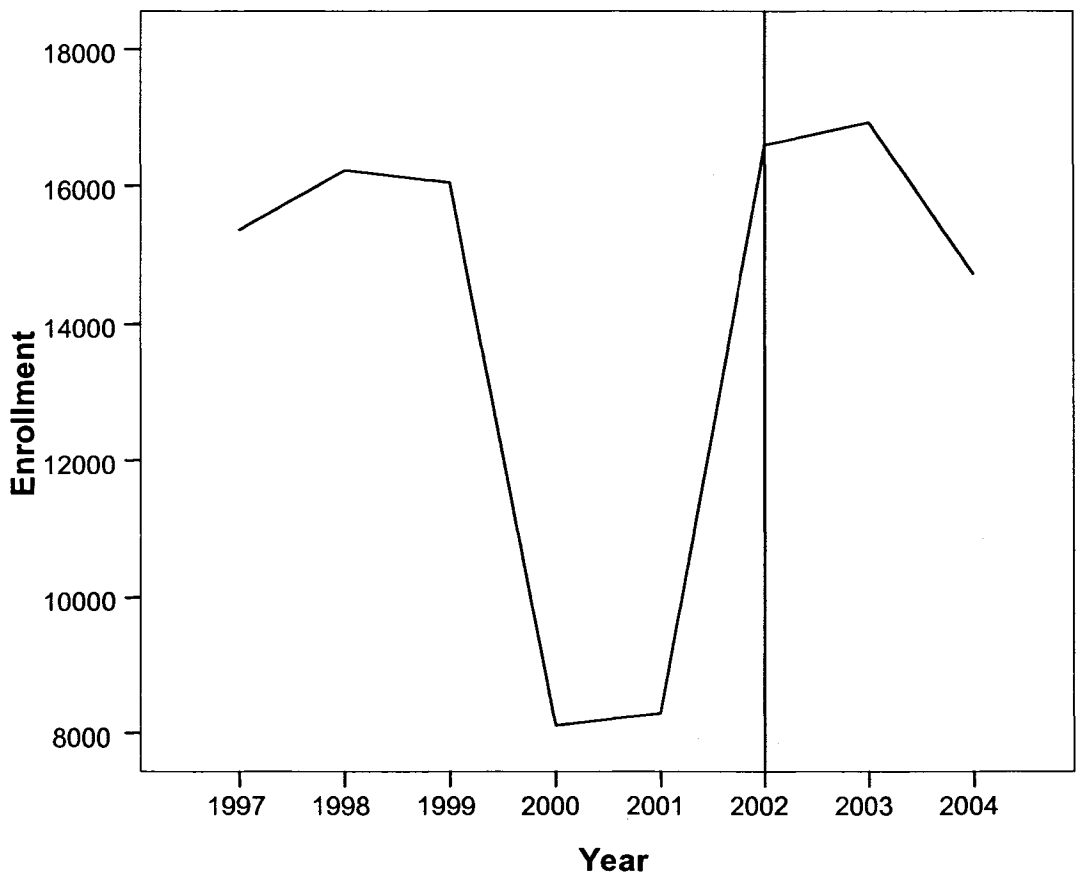


Figure 18 is the graph of the time series for enrollment in West Virginia, with an intervention line indicating the year of the policy adoption. Two years of data post-policy intervention are not an acceptable number of observations to run a time series regression; however the graph of the data are provided to give the reader a general impression of the impact of the policy on enrollment.

Research Question 2

Research Question 2: What is the effect of the following three types of merit aid programs on first time undergraduate enrollment across states (a) full tuition payment programs, (b) partial tuition payment programs, (c) one time payment programs?

This analysis was conducted in three stages, first the data for all of the full tuition payment scholarship states was compiled and analyzed, then the states with partial tuition payment programs, and then the one state with a one time payment program was analyzed. States with full tuition payment programs include: AK, FL, GA, LA, NM, and WV. States with partial tuition payment programs include: AR, KY, MS, MO, NV, and SC. Since TN, WA and WV adopted the policy less than five years ago; there are an insufficient number of years available so they are not included in the analysis. The one time payment state is MI. For this research question, the data for each year for the states is pooled by merit aid payment program. For example, there are five states with full tuition programs that have been in place for more than five years and have varying numbers of years of data, depending on when the program started in that state. $N = \sum$ number of years of data in each state.

Full Tuition Merit Aid Programs

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = T + HEAPP + HSGRAD + INSTTUIT + CONSTANT

Table 14

Regression Analysis Coefficients, Final Model, for Full Tuition[a] (N=67)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	1614.554	1930.174		.836	.406
HSGRAD	.796	.062	.818	12.877	.000
HEAPP	8.87E-006	.000	.211	2.965	.004
INSTTUIT	-2.033	.563	-.081	-3.613	.011
T	385.271	173.682	.052	2.218	.030

Note: R= .991, R Square = .982, Adjusted R Square = .981.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of $F(4,66) = 835.273$, $p<.001$ is below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. More than 98 percent (adjusted $R^2 = .981$) of the variation in

enrollment is explained by the time, unemployment in the states, in state tuition, and the number of high school graduates in each state. Only 2 percent of the variance is due to other factors other than the program intervention, which was stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of higher education appropriations (HEAPP), the number of high school graduates (HSGRAD), time (T), all of which had a positive impact on enrollment. The in state tuition (INSTTUIT) had a negative impact on enrollment in the full tuition states. Accept H_o since there was no significant long (TTT) or short term (TT) impact of the policy adoption on enrollment.

Partial Tuition Merit Aid Programs

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = HEAPP + HSGRAD + TTT + UNEMP + CONSTANT

The significance of $F(4, 78) = 117.280$, $p<.001$ is below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Approximately 86 percent (adjusted $R^2 = .856$) of the variation in enrollment is explained by the number of high school graduates (HSGRAD) in each state, and the long term (TTT) impact of the merit aid program adoption, the higher education appropriations (HEAPP), and unemployment (UNEMP). Nearly 14 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in these states. The standard coefficients (beta)

estimates relative predictive power of the number of high school graduates (HSGRAD), the long term impact of the policy intervention (TTT), unemployment (UNEMP) and the higher education appropriations (HEAPP), all of which had a positive impact on enrollment. Reject H_o since there was a significant negative long term impact of the policy adoption.

Table 15

Regression Analysis Coefficients, Final Model, for Partial Tuition States[a] (N=79)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-14539.6	3205.163		-4.536	.000
HEAPP	2.47E-005	.000	.553	9.013	.000
HSGRAD	.507	.052	.550	9.769	.000
TTT	-348.448	135.170	-.118	-2.578	.012
UNEMP	1972.274	419.142	.219	4.706	.000

Note: R= .929, R Square = .864, Adjusted R Square = .856.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

One Time Payment Merit Aid Programs

Since Michigan was the only state with a One time payment program, it had only 10 years of data and there were seven independent variables in the entry model, the Durbin-Watson statistic showed that there was negative autocorrelation (DW= 3.577). In order to correct for this serial correlation, the researcher reduced the number of independent variables to include only those that would examine the impact of the policy adoption, time (T), program (TT), and long term impact (TTT). This reduction of the number of independent variables brought the Durbin-Watson statistic to within the acceptable range (DW=2.67).

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT

Final model: ENROLL = T + TT + TTT + CONSTANT

The significance of $F(3,9) = 32.194$, $p<.001$ is well below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 91 percent ($R^2 = .912$) of the variation in enrollment is explained by time (T), and the short (TT) and long (TTT) term impact of the policy adoption. Approximately 9 percent of the variance is due to other factors other than those initial factors stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of time, and the short and long term impact of the policy adoption. Accept H_o since there was not a significant long (TTT) or short term (TT) impact of the policy adoption on enrollment.

Table 16

Regression Analysis Coefficients, Final Model, for One time Payment State [a] (N=10)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	72783.800	1560.781		46.633	.000
TT	4554.400	1940.305	.478	2.347	.057
T	1673.000	470.593	1.008	3.555	.012
TTT	-1426.400	665.519	-.543	-2.158	.074

Note: R= .970, R Square = .942, Adjusted R Square = .912.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Summary

Chapter 4 presented the results of the time series graphs and the time series regression analysis of the data. In all, the longitudinal data for fifteen states were graphed to determine the onset and duration of the impact the policy adoption had. The analysis consisted of a backward multiple linear regressions to identify the predictive value and relationship between the merit aid policy adoption and first time undergraduate enrollment in the 15 states that have adopted these policies and across the three types of merit aid programs.

Based on Long's (2003) work on the impact of the Georgia HOPE Scholarship on institutions and tuition, three variables were identified as having significant impact: state higher education appropriations, unemployment, and average tuition for in-state students.

Because the number of high school graduates in a state is directly linked to the number of potential candidates for undergraduates, this study also accounts for the number of public high school graduates in each state.

In the analysis of the impact the adoption of the merit aid policies in each state, there was a significant positive short term impact on enrollment in Alaska, Florida, and Nevada. In states with less than five years of data to analyze, there was a significant short term impact on enrollment in West Virginia. There was a significant long term impact of the policy adoption in eight of the 15 states that adopted these policies, Alaska, Arkansas, Florida, Kentucky, Louisiana, Missouri, New Mexico, and Tennessee. For a summary of these results, see Appendix D.

In addressing research question 2, across the five states with full tuition payment programs (AK, FL, GA, LA, and NM,), there was no significant long or short term impact of the policy adoption on enrollment. Across the six states with partial tuition payment programs (AR, KY, MS, MO, NV, SC), there was a statistically significant negative impact of policy adoption and enrollment, as demonstrated in Figure 35. In the state with a one-time payment program, there was no statistically significant impact of the policy adoption on first time undergraduate enrollment.

CHAPTER 5

SECTOR LEVEL ANALYSES RESULTS

Introduction

The third and fourth research questions are concerned with the impact of merit aid policies on the public 2 year, public 4 year, private 2 year and private 4 year institutions in each of the states and across the three broad merit aid program types (full tuition, partial tuition, and one time payment) and are presented in chapter 5. Research question three (RQ3), how much has merit aid impacted participation by sector and level in the states that have adopted this financial aid policy? And Research question four (RQ4), what is the effect of the following three types of merit aid programs on enrollment across similar programs by sector and level: full tuition; partial tuition; and one time payment?

An analysis of the determinants of sector and level enrollment (two year public, four year public, two year private and four year private) was conducted for each state using time series backward regression for research question RQ3. Finally, the analysis for research question RQ4 consisted of a time series regression of the determinants of sector and level enrollment across states with similar merit aid programs.

For all of the backward stepwise time series regression models, variables in the model that produced the smallest change in the r^2 and where the 'probability of F-to-remove $\geq$.10' no longer held were removed. The significant time series graphs and backward multiple regression analysis results are presented in this chapter. The graphs in

this chapter are the time series for each state. The tables in this chapter include (a) the multiple correlation coefficients, *R*, (b) the coefficient of determination r squared or r^2, (c) adjusted r^2, (d) unstandardized coefficients B with standard error (Std.error), (e) standardized coefficients Beta, t-statistic, and (f) significance (Sig.). Summaries of all of the regression outputs for research question RQ3 can be found in Appendix C.

Finally, autocorrelation is a concern with time series analysis and therefore the Durbin-Watson statistic is calculated in this study as a test of autocorrelation. Only those Durbin-Watson statistics that were of concern because they were outside of the upper or lower limits of the statistic (given the degrees of freedom and number of cases) and demonstrated the existence of autocorrelation in the data are presented in this chapter. The analysis was performed using SPSS 13.0 for Windows.

Research Question 3

Research Question 3: How has merit aid impacted participation by sector and level in the states that have adopted this financial aid policy?

For the analysis of the data in this research question, the N = a data point for each institution in that sector for each year (five years before adoption and every year thereafter) in that state. For each states' sectors, N=$\sum$(years * institutions) For example, in Alaska's 2-year public sector, there was only one institution that reported data for the required amount of time; so, N=years (10) * institutions (1) =10, which means that there were ten years worth of data for one institution in that state.

Since this research question pertains to the sector and level of each state, the results are presented by state and then separated into sector and level (i.e. 2 year public, 4

year public, 2 year private, 4 year private). States that did not have any private 2 year institutions do not have that section reported here.

Alaska, 2-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = T + TT + TTT + CONSTANT

Table 17

Regression Analysis Coefficients, Final Model, for Alaska, 2 year public [a] (N=10)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-3.90	2.718		-1.435	.201
T	3.900	.820	1.212	4.759	.003
TT	10.800	3.379	.584	3.196	.019
TTT	-4.700	1.159	-.916	-4.055	.007

Note: R= .976, R Square = .953, Adjusted R Square = .929.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of $F(3, 9) = 40.427$, $p<.001$ is below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard

error for the final model. Nearly 93 percent (adjusted $R^2 = .929$) of the variation in enrollment is explained by the short (TT) and long (TTT) term impact of the policy adoption and time (T). Almost 7 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the number of time (T), and the short (TT) and long (TTT) term impact of the policy adoption. Enrollment at two year public institutions immediately increased then over the long run, decreased as a result of the long term impact of the policy adoption. Reject H_o since there was both a long (TTT) and short term (TT) impact on enrollment.

Alaska, 4-Year Public and 2-Year Private

Alaska, 4-year public and 2-year private sector analysis yielded no significant models from the analyses.

Alaska, 4-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = T + HSGRAD + INSTTUIT + CONSTANT

The significance of $F(3,19) = 3.583$, $p<.037$ is below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 29 percent (adjusted $R^2 = .290$) of the variation in enrollment is explained by in-state tuition (INSTTUIT), time (T) and the number of high school graduates (HSGRAD). Almost 71 percent of the variance is due to other factors

other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of in-state tuition, the number of high school graduates, and time. Accept H_o since there is no significant long (TTT) or short term impact of the policy adoption on enrollment.

Table 18

Regression Analysis Coefficients, Final Model, for Alaska, 4 year private [a] (N=20)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-277.820	165.538		-1.678	.113
HSGRAD	.065	.029	1.892	2.228	.041
T	-9.688	5.298	-1.592	-1.829	.086
INSTTUIT	-.006	.003	-.466	-2.078	.054

Note: R= .634, R Square = .402, Adjusted R Square = .290.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Arkansas, 2-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = T + INSTTUIT + CONSTANT

The significance of F (2,194) = 15.207, $p<.001$ is below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 13 percent (adjusted $R^2 = .128$) of the variation in enrollment is explained by in-state tuition (INSTTUIT) and time (T). Almost 87 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of in-state tuition (INSTTUIT) and time (T). The policy adoption and time had a negative impact on enrollment in the two year public schools in Arkansas. Accept H_0 since there is no significant long (TTT) or short (TT) term impact of the policy adoption.

Table 19

Regression Analysis Coefficients, Final Model, for Arkansas, 2 year public [a] (N=195)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	730.655	888.299		.823	.412
T	-62.888	18.765	-1.063	-3.351	.001
INSTTUIT	.615	.112	.659	5.488	.000

Note: R= .370, R Square = .137, Adjusted R Square = .128.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Arkansas, 4-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = TTT + INSTTUIT + CONSTANT

Table 20

Regression Analysis Coefficients, Final Model, for Arkansas, 4 year public [a] (N=195)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	613.650	113.170		5.422	.000
TTT	-40.641	14.770	-.286	-2.752	.007
INSTTUIT	.319	.071	.469	4.523	.000

Note: R= .324, R Square = .105, Adjusted R Square = .095.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of F (2, 183) = 10.588, $p<.001$ is below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 10 percent ($R^2 = .095$) of the variation in enrollment is explained by in-state tuition (INSTTUIT) and the long (TTT) term impact of the policy adoption. Almost 90 percent of the variance is due to other factors other than the

variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of in-state tuition (INSTTUIT) and the long term (TTT) impact of the policy adoption. The long term (TTT) policy adoption had a significant negative impact on enrollment in the four year public schools in Arkansas, therefore, reject H_o.

Arkansas, 2-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = T + TTT + INSTTUIT + CONSTANT

The significance of $F(3, 59) = 6.847$, $p<.001$ is below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 27 percent ($R^2 = .268$) of the variation in enrollment is explained by in-state tuition (INSTTUIT), the long term (TTT) impact of the policy adoption, and time (T). Almost 73 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of in-state tuition (INSTTUIT), the long term (TTT) impact of the policy adoption, and time (T). The long term (TTT) impact of the policy adoption was negative in the two year private schools in Arkansas. Reject H_o since there was a significant long (TTT) term impact of the policy adoption on enrolment.

Table 21

Regression Analysis Coefficients, Final Model, for Arkansas, 2-year private [a] (N=60)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-35.482	27.775		-1.278	.207
T	19.308	6.611	2.093	2.921	.005
TTT	-21.914	6.803	-2.236	-3.221	.002
INSTTUIT	.008	.004	.332	2.310	.025

Note: R= .518, R Square = .268, Adjusted R Square = .229.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Arkansas, 4-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = T + TTT + HEAPP + INSTTUIT + CONSTANT

The significance of F (4, 206) = 9.293, $p<.001$ is below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 16 percent ($R^2 = .155$) of the variation in enrollment is explained by in-state tuition (INSTTUIT), higher education appropriations (HEAPP), the long term (TTT) impact of the policy adoption, and time (T). Almost 84 percent of the

variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of in-state tuition (INSTTUIT), higher education appropriations (HEAPP), the long term (TTT) impact of the policy adoption, and time (T). The long term impact (TTT) of the policy adoption was negative on the two year private schools in Arkansas. Reject the H_o since there was a significant long term (TTT) impact.

Table 22

Regression Analysis Coefficients, Final Model, for Arkansas, 4 year private [a] (N=206)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	107.814	42.065		2.563	.011
HEAPP	-6.45E-008	.000	-.140	-2.071	.040
T	14.916	6.354	.356	2.347	.020
TTT	-24.763	7.963	-.520	-3.110	.002
INSTTUIT	.030	.006	.450	5.115	.000

Note: R= .394, R Square = .155, Adjusted R Square = .139.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Florida, 2-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = T + UNEMP + CONSTANT

Table 23

Regression Analysis Coefficients, Final Model, for Florida, 2 year public [a] (N=496)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-25.790	556.401		-.046	.963
UNEMP	157.237	76.315	.126	2.060	.040
T	92.557	25.548	.221	3.623	.000

Note: R= .163, R Square = .027, Adjusted R Square = .023.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of F (2, 496) =6.731, p<.001 is below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Only about 2 percent (adjusted $R^2 = .023$) of the variation in enrollment is explained by unemployment (UNEMP), and time (T). Nearly 98 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of unemployment (UNEMP), and time (T), both of

which had a positive effect on enrollment. Accept H_o since there was no significant long (TTT) or short (TT) term impact on enrollment.

Florida, 4-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = TTT + CONSTANT

Table 24

Regression Analysis Coefficients, Final Model, for Florida, 4 year public[a] (N=115)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	2146.475	219.894		9.761	.000
TTT	250.677	55.033	.394	4.555	.000

Note: R= .394, R Square = .155, Adjusted R Square = .148.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of F (1, 114) = 20.748, $p<.001$ is below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 15 percent (adjusted $R^2 = .148$) of the variation in enrollment is explained by the long term (TTT) impact of the policy adoption. Almost 85

percent of the variance is due to other factors other than the variables included in the original entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power the long term (TTT) impact of the policy adoption. Reject H_o since there was a significant long (TTT) term impact on enrollment.

Florida, 2-Year Private

There were no significant models derived from the analysis for the 2-year private sector in Florida.

Florida, 4-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = TTT + INSTTUIT + CONSTANT

The significance of F (2,519) = 128.583, $p<.000$ is well below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 33 percent (adjusted $R^2 = .330$) of the variation in enrollment is explained by in state tuition (INSTTUIT) and the long term (TTT) impact of the policy adoption. Almost 67 percent of the variance is due to other factors other than the variables included in the original entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of in-state tuition (INSTTUIT) and the long term (TTT) impact of the policy adoption. An increase in the average in-state tuition (INSTTUIT) was associated with an

increase in enrollment. However, the long term impact of the policy adoption had a negative effect on enrollment in 4-year private institutions in the state. Reject H_o since there was a significant long term (TTT) impact on enrollment.

Table 25

Regression Analysis Coefficients, Final Model, for Florida, 4 year private[a] (N=520)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-35.654	26.803		-1.330	.184
TTT	-14.520	4.801	-.116	-3.024	.003
INSTTUIT	.040	.003	.606	15.826	.000

Note: R= .576, R Square = .332, Adjusted R Square = .330.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL) $\alpha = .05$

Georgia, 2-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = HSGRAD + INSTTUIT + UNEMP + CONSTANT

Table 26

Regression Analysis Coefficients, Final Model, for Georgia, 2 year public[a] (N=668)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-1263.526	327.105		-3.863	.000
UNEMP	80.322	25.533	.123	3.146	.002
HSGRAD	.018	.005	.145	3.709	.000
INSTTUIT	.413	.068	.242	6.049	.000

Note: R= .300, R Square = .090, Adjusted R Square = .086.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of F (3,667) = 21.968, p<.000 is well below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 8 percent (adjusted $R^2 = .086$) of the variation in enrollment is explained by in-state tuition (INSTTUIT), unemployment (UNEMP), and the number of high school graduates (HSGRAD). Almost 92 percent of the variance is due to other factors other than the variables included in the original entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of in state tuition (INSTTUIT), the number of high school graduates (HSGRAD), and unemployment (UNEMP). An increase in the average in-state tuition (INSTTUIT), unemployment (UNEMP), and the number of high school

graduates (HSGRAD) were all associated with an increase in enrollment. Accept H_o since there was not a significant long (TTT) or short (TT) term impact on enrollment.

Georgia, 4-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = INSTTUIT + T + CONSTANT

Table 27

Regression Analysis Coefficients, Final Model, for Georgia, 4-year public[a] (N=668)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-738.655	219.529		-3.365	.001
T	-50.186	12.362	-.272	-4.060	.000
INSTTUIT	1.279	.146	.588	8.781	.000

Note: R= .454, R Square = .206, Adjusted R Square = .199.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of F (2,333) = 41.975, p<.000 is well below the $\alpha \leq .05$. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 20 percent (adjusted $R^2 = .197$) of the variation

in enrollment is explained by in-state tuition (INSTTUIT) and time (T). Almost 80 percent of the variance is due to other factors other than the variables included in the entry model which was stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of average in-state tuition (INSTTUIT) and time (T). An increase in the average in-state tuition (INSTTUIT) was associated with an increase in enrollment. However, the enrollment trend was decreasing over time in 4-year public institutions. Accept H_0 since there was not a significant long (TTT) or short (TT) term impact on enrollment.

Georgia, 2-Year Private

There was not a significant model that could be determined for the 2-year private sector in Georgia because the N was too small.

Georgia, 4-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = HEAPP + INSTTUIT + T + CONSTANT

The significance of $F(3,402) = 28.931$, $p<.001$ is well below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 17 percent (adjusted $R^2 = .172$) of the variation in enrollment is explained by in-state tuition (INSTTUIT), higher education appropriations (HEAPP), and time (T). Almost 83 percent of the variance is due to other factors other than the variables included in the original entry model which

were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of in state tuition (INSTTUIT), higher education appropriations (HEAPP), and time (T). Higher education appropriations (HEAPP) and the average in-state tuition (INSTTUIT) had a significant positive effect on 4 year private enrollment in Georgia. Accept H_0 since there was not a significant long (TTT) or short (TT) term impact on enrollment.

Table 28

Regression Analysis Coefficients, Final Model, for Georgia, 4 year private[a] (N=176)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-113.899	141.481		-.805	.421
HEAPP	5.29E-007	.000	.504	2.326	.021
T	-47.182	15.713	-.663	-3.003	.003
INSTTUIT	.035	.004	.488	8.882	.000

Note: R= .423, R Square = .179, Adjusted R Square = .172.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Kentucky, 2-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = INSTTUIT + UNEMP + T + CONSTANT

Table 29

Regression Analysis Coefficients, Final Model, for Kentucky, 2-year public[a] (N=270)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	1093.315	260.274		4.201	.000
UNEMP	-126.955	52.164	-.186	-2.434	.016
T	-35.194	13.422	-.289	-2.622	.009
INSTTUIT	.208	.071	.363	2.943	.004

Note: R= .185, R Square = .034, Adjusted R Square = .023.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of F (3, 269) = 3.157, $p<.025$ is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 2 percent (adjusted $R^2 = .023$) of the variation in enrollment is explained by in-state tuition (INSTTUIT), unemployment (UNEMP), and time (T). Almost 98 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of in-state tuition (INSTTUIT), unemployment (UNEMP), and time (T). Unemployment (UNEMP)

and time (T) both had a negative impact on 2-year public enrollment, while average in-state tuition (INSTTUIT) had a significant positive effect on enrollment. Accept H_o since there was not a significant long (TTT) or short (TT) term impact on enrollment.

Kentucky, 4-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = INSTTUIT + TTT + CONSTANT

The significance of $F(2, 87) = 18.041$, $p<.001$ is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Almost 28 percent (adjusted $R^2 = .281$) of the variation in enrollment is explained by in-state tuition (INSTTUIT) and the long (TTT) term impact of the policy adoption. Nearly 72 percent of the variance is due to other factors other than the variables included in the original entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of in-state tuition (INSTTUIT) and the long (TTT) term impact of the policy adoption. The long term (TTT) impact of the policy adoption had a significant negative effect on enrollment for this sector. Finally, average in state tuition (INSTTUIT) had a significant positive impact on enrollment at 4-year pubic institutions in Kentucky. Reject H_o since there was a significant long term (TTT) impact on enrollment.

Table 30

Regression Analysis Coefficients, Final Model, for Kentucky, 4-year public[a] (N=88)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-224.985	363.468		-.619	.538
TTT	-184.323	57.671	-.480	-3.196	.002
INSTTUIT	.933	.166	.845	5.621	.000

Note: R= .546, R Square = .298, Adjusted R Square = .281.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Kentucky 2-Year Private

There were not a sufficient number of institutions to conduct an analysis of this sector in this state.

Kentucky, 4-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = TTT + INSTTUIT + CONSTANT

The significance of F (2,236) = 22.059, $p<.001$ is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 15 percent (adjusted $R^2 = .151$) of the variation

in enrollment is explained by in state tuition (INSTTUIT) and the long term (TTT) impact of the policy adoption. Almost 85 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of in state tuition (INSTTUIT) and the long term (TTT) impact of the policy adoption. Accept H_o since there was no significant long (TTT) or short term impact on enrollment.

Table 31

Regression Analysis Coefficients, Final Model, for Kentucky, 4-year private[a] (N=237)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	127.307	16.853		7.554	.000
TTT	-6.755	4.014	-.108	-1.683	.094
INSTTUIT	.012	.002	.423	6.606	.000

Note: R= .398, R Square = .159, Adjusted R Square = .151.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Louisiana, 2-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= HEAPP + HSGRAD + UNEMP + INSTTUIT + T + TT + TTT

Final model: ENROLL = HSGRAD + INSTTUIT + T + TTT + UNEMP + CONSTANT

Table 32

Regression Analysis Coefficients, Final Model, for Louisiana, 2-year public[a] (N=8)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	1801.022	781.623		-2.304	.022
HSGRAD	.031	.018	.118	1.703	.089
INSTTUIT	.781	.047	.600	16.663	.000
T	23.977	13.747	.230	1.744	.082
TTT	-49.394	16.363	-.346	-3.019	.003
UNEMP	80.273	28.850	.186	2.782	.006

Note: R= .597, R Square = .356, Adjusted R Square = .350.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of F (5,519) = 56.803, $p<.001$ is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Almost 35 percent (adjusted $R^2 = .350$) of the variation in enrollment is explained by unemployment (UNEMP), the number of high school graduates (HSGRAD), the long term (TTT) impact of the policy adoption, and time (T). Nearly 65 percent of the variance is due to other factors other than the variables included

in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of unemployment, the number of high school graduates (HSGRAD), the long term (TTT) impact of the policy adoption, average in-state tuition (INSTTUIT), and time (T). The long term (TTT) impact of the policy adoption on two year pubic enrollment was negative. However, the impact of the number of high school graduates (HSGRAD), average in-state tuition (INSTTUIT), time (T), and unemployment (UNEMP) all had a positive impact on 2-year public enrollment in Louisiana. Reject H_o since there was a significant long term (TTT) impact of the policy adoption on enrollment.

Louisiana, 4-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = INSTTUIT + CONSTANT

The significance of $F(1,155) = 28.515$, $p<.001$ is below the $\alpha \leq .05$ threshold. Table 33 provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 15 percent (adjusted $R^2 = .151$) of the variation in enrollment is explained by in-state tuition (INSTTUIT). Almost 85 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of in-state tuition (INSTTUIT), which had a positive

relationship to enrollment. Accept H_0 since there was no long (TTT) or short (TT) term impact of the policy adoption.

Table 33

Regression Analysis Coefficients, Final Model, for Louisiana, 4-year public[a] (N=156)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-314.304	398.530		-.789	.432
INSTTUIT	.921	.173	.395	5.340	.000

Note: R= .395, R Square = .156, Adjusted R Square = .151.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Louisiana, 2-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

There was significant missing data for in-state tuition (INSTTUIT) for the institutions in this sector, which is why that variable was not included in the entry model.

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP

Final model: ENROLL = HSGRAD + TT + CONSTANT

The significance of $F(2,7) = 38.985$, $p<.001$ is below the $\alpha \leq .05$ threshold. Table 34 provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 92 percent (adjusted $R^2 = .916$) of the variation in enrollment

is explained by the number of high school graduates (HSGRAD) and the short term (TT) impact of the policy adoption. Almost 8 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the number of high school graduates (HSGRAD) and the short term (TT) impact of the policy adoption. Reject H_o since there was a significant immediate (TT) impact of the policy adoption on enrollment.

Table 34

Regression Analysis Coefficients, Final Model, for Louisiana, 2-year private[a] (N=8)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	248.367	25.486		9.745	.000
HSGRAD	-.006	.001	-1.271	-8.772	.000
TT	12.684	1.953	.941	6.493	.001

Note: R= .969, R Square = .940, Adjusted R Square = .916.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Louisiana, 4-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = INSTTUIT + T + CONSTANT

The significance of F (2,117) = 109.039, $p<.001$ is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 65 percent (adjusted R^2 =.649) of the variation in enrollment is explained by in-state tuition (INSTTUIT) and time (T). Almost 35 percent of the variance is due to other factors other than the variables included in the original entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of in-state tuition (INSTTUIT) and time (T). Time (T) had a negative impact on 4-year private enrollment, while average in-state tuition (INSTTUIT) had a significant positive effect on enrollment. Accept H_o since there was no significant impact for the long (TTT) or short (TT) term

Table 35

Regression Analysis Coefficients, Final Model, for Louisiana, 4-Year Private[a] (N=118)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	14.292	57.471		.249	.804
INSTTUIT	.060	.004	.842	14.664	.000
T	-20.023	7.374	-.156	-2.716	.008

Note: R= .809, R Square = .655, Adjusted R Square = .649.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Michigan, 2-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= HEAPP + HSGRAD + INSTTUIT + T + TT + TTT + UNEMP

Final model: ENROLL = HSGRAD + INSTTUIT + UNEMP + CONSTANT

Table 36

Regression Analysis Coefficients, Final Model, for Michigan, 2-Year Public[a] (N=249)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-1864.295	400.342		-4.657	.000
HSGRAD	.051	.008	.450	6.740	.000
UNEMP	66.326	25.843	.151	2.566	.011
INSTTUIT	-.188	.033	-.376	-5.660	.000

Note: R= .425, R Square = .181, Adjusted R Square = .171.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of F (3,248) = 18.053, $p<.001$ is below the $\alpha \leq .05$ threshold. Table 36 provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 17 percent (adjusted $R^2 = .171$) of the variation in enrollment is explained by average in-state tuition (INSTTUIT), unemployment

(UNEMP), and the number of high school graduates (HSGRAD). Almost 83 percent of the variance is due to other factors other than the variables included in the original entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of average in-state tuition (INSTTUIT), unemployment (UNEMP), and the number of high school graduates (HSGRAD). The impact of average in-state tuition (INSTTUIT) was negative and significant. The impact of the number of high school graduates (HSGRAD) and unemployment (UNEMP) were both positive and significant for 2-year public institutions. Accept H_o since there was no significant long (TTT) or short (TT) term impact of the policy adoption on enrollment.

Michigan, 4-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = INSTTUIT + T + CONSTANT

The significance of F (2, 167) = 7.511, $p<.001$ is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 7 percent (adjusted $R^2 = .072$) of the variation in enrollment is explained by average in-state tuition (INSTTUIT) and time (T). Almost 92 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of average in-state tuition (INSTTUIT) and time (T). The impact of the time (T) on enrollment was negative but

not significant and the impact of average in-state tuition (INSTTUIT) was positive and significant for 4-year institutions. Accept H_0 since there was no significant short (TT) or long (TTT) term impact on enrollment.

Table 37

Regression Analysis Coefficients, Final Model, for Michigan, 4-Year Public[a] (N=168)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	581.529	228.863		2.541	.012
T	-46.305	24.739	-.176	-1.872	.063
INSTTUIT	.326	.085	.361	3.829	.000

Note: R= .289, R Square = .083, Adjusted R Square = .072.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Michigan, 2-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = HSGRAD + T + CONSTANT

The significance of F (2,64) = 3.690, $p<.031$ is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and

standard error for the final model. Nearly 8 percent (adjusted R^2 =.078) of the variation in enrollment is explained by time (T) and the number of high school graduates (HSGRAD). Almost 82 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of time (T) and the number of high school graduates (HSGRAD). The impact of high school graduates (HSGRAD) on enrollment was significantly negative while the impact of time was positive and significant for 2-year private institutions. Accept H_o since there was no significant long (TTT) or short (TT) term impact on enrollment.

Table 38

Regression Analysis Coefficients, Final Model, for Michigan, 2-Year Private[a] (N=65)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	3066.463	1344.091		2.281	.026
HSGRAD	-.066	.030	-1.033	-2.203	.031
T	73.684	29.051	1.189	2.536	.014

Note: R= .326, R Square = .106, Adjusted R Square = .078.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), α = .05

Michigan, 4-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = HEAPP + INSTTUIT + UNEMP + CONSTANT

The significance of F (3, 443) = 56.247, $p<.001$ is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 27 percent (adjusted R^2 =.272) of the variation in enrollment is explained by average in-state tuition (INSTTUIT), unemployment (UNEMP), and higher education appropriations (HEAPP). Almost 73 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of unemployment (UNEMP), average in-state tuition (INSTTUIT), and higher education appropriations (HEAPP). The impact of the higher education appropriations (HEAPP) and unemployment (UNEMP) on four year private enrollment were significant and negative. However, the impact of the average in-state tuition (INSTTUIT) was positive and significant. Accept H_o since there was no significant long (TTT) or short (TT) term impact on enrollment.

Table 39

Regression Analysis Coefficients, Final Model, for Michigan, 4-Year Private[a] (N=444)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	561.586	169.366		3.316	.001
HEAPP	-4.44E-007	.000	-.231	-3.876	.000
UNEMP	-55.877	20.026	-.162	-2.790	.005
INSTTUIT	.037	.003	.555	12.987	.000

Note: R= .526, R Square = .277, Adjusted R Square = .272.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Missouri, 2-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = INSTTUIT + CONSTANT

The significance of F (1,265) = 5.471, p=.020 is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Only about 2 percent (adjusted R^2 =.017) of the variation in enrollment is explained by average in-state tuition (INSTTUIT). Nearly 98 percent of the variance is due to other factors other than the variables included in the

entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of average in-state tuition (INSTTUIT). The impact of average in-state tuition was positive and significant. Accept H_o since there was no significant long (TTT) or short (TT) term impact on enrollment.

Table 40

Regression Analysis Coefficients, Final Model, for Missouri, 2-Year Public[a] (N=266)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	641.335	190.318		3.370	.001
INSTTUIT	.175	.075	.142	2.339	.020

Note: R= .142, R Square = .020, Adjusted R Square = .017.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Missouri, 4-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = INSTTUIT + T + TTT + CONSTANT

The significance of F (3, 167) = 9.637, $p<.001$ is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and

standard error for the final model. Nearly 13 percent (adjusted R^2 =.134) of the variation in enrollment is explained by time (T), the long term (TTT) effects of the policy adoption, and the average in-state tuition (INSTTUIT). Almost 87 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of time (T), the long term (TTT) effects of the policy adoption, and the average in-state tuition (INSTTUIT). The impact of time and average in-state tuition (INSTTUIT) on enrollment was positive and significant. The long term (TTT) impact of the policy adoption was negative and significant on enrollment in 4-year public institutions in Missouri. Reject H_0 since there was a significant long (TTT) term impact on enrollment.

Table 41

Regression Analysis Coefficients, Final Model, for Missouri, 4-Year Public[a] (N=168)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-497.423	621.342		-.801	.425
T	252.126	120.878	.396	2.086	.039
TTT	-394.831	194.738	-.394	-2.027	.044
INSTTUIT	.448	.085	.405	5.259	.000

Note: R= .387, R Square = .150, Adjusted R Square = .134.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), α = .05

Missouri, 2-Year Private and 4-Year Private

In Missouri, the 2-year private and 4-year private did not yield models that were significant for enrollment.

Mississippi, 2-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = INSTTUIT + HEAPP + T + CONSTANT

The significance of F (3, 223) = 3.743, $p<.012$ is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 4 percent (adjusted $R^2 = .036$) of the variation in enrollment is explained by in-state tuition (INSTTUIT), higher education appropriations (HEAPP), and time (T). Almost 96 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of in-state tuition (INSTTUIT), higher education appropriations (HEAPP), and time (T). Accept H_o since there was no significant short (TT) or long (TTT) term impact on enrollment.

Table 42

Regression Analysis Coefficients, Final Model, for Mississippi, 2-year public[a] (N=224)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	2281.263	720.246		3.167	.002
HEAPP	-1.59E-006	.000	-.264	-1.735	.084
T	126.552	46.130	.532	2.743	.007
INSTTUIT	-.863	.501	-.188	-1.724	.086

Note: R= .260, R Square = .049, Adjusted R Square = .036.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Mississippi, 4-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= HEAPP + HSGRAD + INSTTUIT + T + TT + TTT+ UNEMP

Final model: ENROLL = HEAPP + INSTTUIT + T + TT + CONSTANT

The significance of F (4,111) = 27.045, $p<.001$ is above the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 48 percent (adjusted R^2 =.484) of the variation in enrollment is explained by in-state tuition (INSTTUIT), the short term (TT) impact of the policy adoption, higher education appropriations (HEAPP) and time (T). Almost 52

percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of in-state tuition (INSTTUIT), the short term (TT) impact of the policy adoption, higher education appropriations (HEAPP) and time (T). The impact of time (T) on enrollment was negative and significant. The impact of average in-state tuition (INSTTUIT) and higher education appropriations (HEAPP) were positive and significant on enrollment in 4-year public institutions in Mississippi. The short (TT) and long (TTT) term impact of the policy adoption was positive but not significant at the $\alpha \leq .05$ level so accept H_o.

Table 43

Regression Analysis Coefficients, Final Model, for Mississippi, 4-Year Public[a] (N=112)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-2653.152	433.144		-6.125	.000
HEAPP	1.92E-006	.000	.497	3.323	.001
T	-259.571	32.883	-1.702	-7.894	.000
TT	329.348	176.127	.257	1.870	.064
INSTTUIT	1.484	.143	1.337	10.386	.000

Note: R= .709, R Square = .503, Adjusted R Square = .484.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Mississippi, 2-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= HEAPP + HSGRAD + INSTTUIT + T + TT + TTT + UNEMP

Final model: ENROLL = INSTTUIT + UNEMP + CONSTANT

Table 44

Regression Analysis Coefficients, Final Model, for Mississippi, 2-Year Private[a] (N=23)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	222.349	119.723		1.857	.078
UNEMP	22.415	10.623	.361	2.110	.048
INSTTUIT	-.049	.016	-.513	-2.997	.007

Note: R= .780, R Square = .608, Adjusted R Square = .569.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of $F(2,22) = 15.526$, $p<.001$ is below the $\alpha \leq .05$ threshold. Table 44 provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 57 percent (adjusted $R^2 = .569$) of the variation in enrollment is explained by in-state tuition (INSTTUIT) and unemployment (UNEMP). Almost 43 percent of the variance is due to other factors other than the variables included

in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of in-state tuition (INSTTUIT) and unemployment (UNEMP). The impact of average in-state tuition (INSTTUIT) was negative and significant on enrollment in 2-year private institutions in Mississippi. Unemployment (UNEMP) had a significant positive impact on enrollment. Accept the H_o since there was no significant long (TTT) or short (TT) term impact on enrollment.

Mississippi, 4-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= HEAPP + HSGRAD + INSTTUIT + T + TT + TTT + UNEMP

Final model: ENROLL = INSTTUIT + T + CONSTANT

The significance of $F(2,137) = 61.203$, $p<.001$ is above the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 47 percent (adjusted $R^2 = .468$) of the variation in enrollment is explained by time (T) and the average in-state tuition (INSTTUIT). Almost 53 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of time (T) and the average in-state tuition (INSTTUIT). The impact of time (T) on enrollment was negative and significant. The impact of average in-state tuition (INSTTUIT) was positive and significant on enrollment in 4-year private institutions in Mississippi. Accept H_o since there was no significant long (TTT) or short (TT) term impact.

Table 45

Regression Analysis Coefficients, Final Model, for Mississippi, 4-Year Private[a] (N=138)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	38.482	18.938		2.032	.044
T	-6.420	2.081	-.205	-3.086	.002
INSTTUIT	.026	.002	.734	11.032	.000

Note: R= .690, R Square = .476, Adjusted R Square = .468.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

New Mexico, 2-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = INSTTUIT + T + CONSTANT

The significance of F (2, 29) = 18.753, $p<.001$ is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 55 percent (adjusted R^2 =.550) of the variation in enrollment is explained by in-state tuition (INSTTUIT) and time (T). Almost 45 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard

coefficients (beta) estimates relative predictive power of in-state tuition (INSTTUIT) and time (T). Accept H_o since there was no significant long (TTT) or short (TT) term impact of the policy adoption on enrollment.

Table 46

Regression Analysis Coefficients, Final Model, for New Mexico, 2-Year Public[a] (N=30)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-5401.529	1173.729		-4.602	.000
INSTTUIT	8.064	1.318	1.192	6.120	.000
T	-423.139	92.910	-.887	-4.554	.000

Note: R= .763, R Square = .581, Adjusted R Square = .550.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

New Mexico, 4-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = INSTTUIT + HSGRAD + CONSTANT

Table 47

Regression Analysis Coefficients, Final Model, for New Mexico, 4-Year Public[a] (N=30)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-445.543	412.129		-1.081	.289
HSGRAD	-.095	.034	-.249	-2.754	.010
INSTTUIT	1.660	.147	1.019	11.271	.000

Note: R= .915, R Square = .838, Adjusted R Square = .826.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of F (2, 29) = 69.874, $p<.001$ is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 83 percent (adjusted R^2 =.826) of the variation in enrollment is explained by in-state tuition (INSTTUIT) and the number of high school graduates (HSGRAD). Almost 17 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of in-state tuition (INSTTUIT) and the number of high school graduates (HSGRAD). In-state tuition (INSTTUIT) had a significant and positive impact on enrollment in 4-year institutions, whereas the number of high school graduates (HSGRAD) had a negative and significant impact on 4-year public enrollment. Accept H_o since there was no significant long (TTT) or short (TT) term impact of the policy adoption on enrollment.

New Mexico, 2-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = TT + UNEMP + CONSTANT

Table 48

Regression Analysis Coefficients, Final Model, for New Mexico, 2-Year Private[a] (N=9)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	1592.601	325.982		4.886	.003
TT	-401.950	87.866	-1.335	-4.575	.004
UNEMP	-180.014	45.040	-1.166	-3.997	.007

Note: R= .885, R Square = .782, Adjusted R Square = .710.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of F (4,8) = 10.793, $p<.010$ is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 71 percent ($R^2 = .710$) of the variation in enrollment is explained the immediate impact (TT) of the policy adoption and

unemployment (UNEMP). Almost 29 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the immediate impact of the policy adoption (TT) and unemployment (UNEMP). Both the immediate impact (TT) of the policy adoption and unemployment (UNEMP) had a significant negative impact on enrollment in 2-year private institutions. Reject H_o since there was a significant short (TT) term impact of the policy adoption on enrollment.

New Mexico 4-Year Private

The New Mexico 4-year private institution models did not yield any significant results because there were not enough institutions with reported data in this category in the state to analyze.

Nevada, 2-Year Public

Nevada, 2-year public did not yield a significant model for the effect of the adoption of the merit aid policy on enrollment.

Nevada, 4-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = INSTTUIT + CONSTANT

The significance of F (1, 364) = 4.747, p=.030 is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 1 percent (adjusted R^2 =.010) of the variation

in enrollment is explained by the average in-state tuition (INSTTUIT). Almost 99 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the impact of the average in-state tuition (INSTTUIT), which had a significant and negative impact on enrollment. Accept H_o since there was no significant long (TTT) or short (TT) term impact of the policy adoption on enrollment.

Table 49

Regression Analysis Coefficients, Final Model, for Nevada, 4-Year Public[a] (N=365)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	511.935	37.125		13.789	.000
INSTTUIT	-.016	.007	-.114	-2.179	.030

Note: R= .410, R Square = .013, Adjusted R Square = .010.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Nevada, 2-Year Private

There are no 2-year private institutions in Nevada.

Nevada, 4-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = INSTTUIT + CONSTANT

Table 50

Regression Analysis Coefficients, Final Model, for Nevada, 4-Year Private[a] (N=42)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	43.292	31.585		1.371	.178
INSTTUIT	.006	.002	.410	2.841	.007

Note: R= .410, R Square = .168, Adjusted R Square = .147.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of F (1, 41) = 8.070, p=.007 is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 15 percent (adjusted R^2 =.147) of the variation in enrollment is explained by in-state tuition (INSTTUIT). Almost 85 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of in-state tuition (INSTTUIT). Accept H_o since there was no significant long (TTT) or short (TT) term impact of the policy adoption on enrollment.

South Carolina, 2-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = INSTTUIT + T + UNEMP + CONSTANT

Table 51

Regression Analysis Coefficients, Final Model, for South Carolina, 2-Year Public[a] (N=252)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	248.777	181.854		1.368	.173
INSTTUIT	-.299	.088	-.386	-3.390	.001
T	71.968	18.067	.423	3.983	.000
UNEMP	89.310	35.897	.180	2.488	.014

Note: R= .251, R Square =.063, Adjusted R Square = .052.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of $F(3, 251) = 5.580$, $p<.001$ is below the $\alpha \leq .05$ threshold. Table 51 provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 7 percent ($R^2 = .065$) of the variation in enrollment is

explained by the average in-state tuition (INSTTUIT), time (T), and unemployment (UNEMP). Almost 93 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the impact of the average in-state tuition (INSTTUIT), time (T), and unemployment (UNEMP). Both time (T) and unemployment (UNEMP) had a significant positive effect on enrollment, while the average in-state tuition (INSTTUIT) had a significant negative impact. Accept H_o since there was no significant long (TTT) or short (TT) term impact of the policy adoption on enrollment.

South Carolina, 4-Year Public

Analysis of the 4-year public sector in South Carolina did not yield a significant model.

South Carolina, 2-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = INSTTUIT + T + CONSTANT

The significance of $F(2, 16) = 50.340$, $p<.001$ is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Almost 86 percent (adjusted $R^2 = .860$) of the variation in enrollment is explained by the average in-state tuition (INSTTUIT) and time (T). Nearly 14 percent of the variance is due to other factors other than the variables included

in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the impact of the average in-state tuition (INSTTUIT) and time (T). The time (T) trend for enrollment in this sector was significant and negative. Average in-state tuition (INSTTUIT) had a significant positive effect on enrollment in the 2-year private sector. Accept H_o since there was no significant long (TTT) or short (TT) term impact of the policy adoption on enrollment.

Table 52

Regression Analysis Coefficients, Final Model, for South Carolina, 2-Year Private[a] (N=17)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	43.906	38.511		1.140	.273
INSTTUIT	.057	.006	.968	10.005	.000
T	-12.912	3.840	-.325	-3.362	.005

Note: R= .937, R Square =.878, Adjusted R Square = .860.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

South Carolina, 4-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL= INSTTUIT + CONSTANT

Table 53

Regression Analysis Coefficients, Final Model, for South Carolina, 4-Year Private[a] (N=269)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	227.690	30.976		7.350	.000
INSTTUIT	.006	.003	.141	2.328	.021

Note: R= .141, R Square =.020 , Adjusted R Square = .016

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of F (1, 268) = 5.419, $p<.021$, which is below the $\alpha \leq .05$ threshold. Table 53 provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 2 percent (adjusted R^2 =.016) of the variation in enrollment is explained by the average in-state tuition (INSTTUIT). Almost 98 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the impact of the average in-state tuition (INSTTUIT), which had a significant and positive impact on enrollment.

Accept H_0 since there was no significant long (TTT) or short (TT) term impact of the policy adoption on enrollment.

Tennessee , 2-Year Public

All of the Tennessee analyses were done without the long term (TTT) dummy variable because the policy has only been in place for one year.

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL= INSTTUIT + CONSTANT

Table 54

Regression Analysis Coefficients, Final Model, for Tennessee, 2-Year Public[a] (N=256)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	368.685	189.886		1.942	.055
INSTTUIT	.384	.123	.316	3.130	.002

Note: R= .316, R Square =.100 , Adjusted R Square = .090

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of F (1,89) = 9.794, $p<.002$, which is below the $\alpha \leq .05$ threshold. Table 54 provides the unstandardized coefficients, standardized coefficients,

and standard error for the final model. Nearly 9 percent (adjusted R^2 =.090) of the variation in enrollment is explained by the average in-state tuition (INSTTUIT). Almost 91 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the impact of the average in-state tuition (INSTTUIT). Accept H_o since there was not a significant long (TTT) or short (TT) term impact of the policy adoption on enrollment.

Tennessee, 4-Year Public

The analysis of Tennessee's 4-year public sector did not yield a significant model.

Tennessee, 2-Year Private

All of the Tennessee analyses were done without the long term (TTT) dummy variable because the policy has only been in place for one year.

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL= INSTTUIT + T + CONSTANT

The significance of F (2,18) = 4.724, $p<.024$, which is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 29 percent (adjusted R^2 =.293) of the variation in enrollment is explained by the average in-state tuition (INSTTUIT) and time (T). Almost 71 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant

in this state. The standard coefficients (beta) estimates relative predictive power of the impact of the average in-state tuition (INSTTUIT) and time (T). Accept H_o since there was not a significant long (TTT) or short (TT) term impact of the policy adoption on enrollment.

Table 55

Regression Analysis Coefficients, Final Model, for Tennessee, 2-Year Private[a] (N=19)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	102.725	40.777		2.519	.023
T	-15.864	7.462	-.432	-2.126	.049
INSTTUIT	.017	.006	.534	2.629	.018

Note: R= .609, R Square =.371 , Adjusted R Square = .293

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Tennessee, 4-Year Private

All of the Tennessee analyses were done without the long term (TTT) dummy variable because the policy has only been in place for one year.

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL= INSTTUIT + T + CONSTANT

Table 56

Regression Analysis Coefficients, Final Model, for Tennessee, 4-Year Private[a] (N=255)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-32.871	39.052		-.842	.401
T	-18.235	7.130	-.132	-2.558	.011
INSTTUIT	.035	.003	.630	12.225	.000

Note: R= .610, R Square =.373 , Adjusted R Square = .368

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of F (2,254) = 74.838, $p<.001$, which is below the $\alpha \leq .05$ threshold. Table 56 provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 37 percent (adjusted R^2 =.368) of the variation in enrollment is explained by the average in-state tuition (INSTTUIT) and time (T). Almost 63 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the impact of the average in-state tuition (INSTTUIT) and time (T). Accept H_o since there was not a significant long (TTT) or short (TT) term impact of the policy adoption on enrollment.

Washington, 2-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL= HSGRAD + HEAPP + T + TT + TTT + UNEMP + CONSTANT

The significance of F (6,255) = 52.122, $p<.001$, which is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 55 percent (adjusted R^2 =.546) of the variation in enrollment is explained by higher education appropriations (HEAPP), the number of high school graduates (HSGRAD), unemployment (UNEMP), the long (TTT) and short (TT) term impact of the policy adoption, and time (T). Almost 44 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the impact of time (T), which had a significant and negative effect on enrollment; the higher education appropriations (HEAPP), the number of high school graduates (HSGRAD), the long (TTT) and short (TT) term impact of the policy adoption, and unemployment (UNEMP), all of which had significant and positive impact on enrollment. Reject H_o since there was a significant long (TTT) and short (TT) term impact of the policy adoption on enrollment.

Table 57

Regression Analysis Coefficients, Final Model, for Washington, 2-Year Public[a] (N=256)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-46176.45	5568.368		-8.293	.000
HEAPP	2.65E-005	.000	3.212	8.533	.000
HSGRAD	.210	.040	.700	5.205	.000
T	-3285.565	313.007	-8.380	-10.497	.000
TT	897.969	425.776	.431	2.109	.036
TTT	3152.241	312.608	2.455	10.084	.000
UNEMP	2424.117	215.873	2.786	11.229	.000

Note: R= .746, R Square =.557 , Adjusted R Square = .546

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Washington, 4-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL= INSTTUIT + T + CONSTANT

Table 58

Regression Analysis Coefficients, Final Model, for Washington, 4-Year Public[a] (N=48)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-5390.703	783.430		-6.881	.000
INSTTUIT	2.825	.303	1.258	9.339	.000
T	-489.572	77.251	-.854	-6.337	.000

Note: R= .815, R Square =.664 , Adjusted R Square = .649

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of F (2, 47) = 44.439, $p<.001$, which is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 65 percent (adjusted R^2 =.649) of the variation in enrollment is explained by the average in-state tuition (INSTTUIT) and time (T). Almost 35 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the impact of average in-state tuition (INSTTUIT) and time (T). The average in-state tuition (INSTTUIT) had a significant and positive effect on enrollment. Time (T) had a significant negative impact on enrollment. Accept H_o since there was no significant long (TTT) or short (TT) term impact of the policy adoption on enrollment.

Washington, 2 Year Private

Washington, 2 year private had N=2, which was not enough observations to analyze the impact of the policy adoption in that sector.

Washington, 4-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL= INSTTUIT + HEAPP + CONSTANT

The significance of $F(2,119) = 63.728$, $p<.001$, which is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Almost 51 percent (adjusted R^2 =.513) of the variation in enrollment is explained by higher education appropriations (HEAPP) and the average in-state tuition (INSTTUIT). Nearly 49 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the impact of average in-state tuition (INSTTUIT) and the higher education appropriations (HEAPP). Higher education appropriations (HEAPP) had a negative and significant effect on enrollment in the 4-year private institutions. The average in-state tuition (INSTTUIT) had a significant and positive effect on enrollment. Accept H_o since there was no significant long (TTT) or short (TT) term impact of the policy adoption on enrollment.

Table 59

Regression Analysis Coefficients, Final Model, for Washington, 4-Year Private[a] (N=120)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	459.249	194.783		2.358	.020
HEAPP	-5.53E-007	.000	-.236	-3.501	.001
INSTTUIT	.037	.003	.761	11.290	.000

Note: R= .722, R Square =.521 , Adjusted R Square = .513

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

West Virginia, 2-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL= INSTTUIT + TTT + HEAPP + CONSTANT

The significance of F (4, 42) = 1.926, p<.003, which is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 29 percent (adjusted R^2 =.294) of the variation in enrollment is explained by the average in-state tuition (INSTTUIT), the long term (TTT) impact of the policy adoption, and higher education appropriations (HEAPP). Almost 71 percent of the variance is due to other factors other than the

variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the average in-state tuition (INSTTUIT), the long term (TTT) impact of the policy adoption, and higher education appropriations (HEAPP). The average in-state tuition (INSTTUIT) had a significant negative effect on enrollment. The long term (TTT) impact of the policy adoption and higher education appropriations (HEAPP) both had a negative and significant impact on 2-year public enrollment in West Virginia. Reject H_o since there was a significant long (TTT) term impact of the policy adoption on enrollment.

Table 60

Regression Analysis Coefficients, Final Model, for West Virginia, 2-Year Public[a] (N=43)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	3263.136	935.269		3.489	.001
HEAPP	-6.95E-006	.000	-.496	-2.840	.007
INSTTUIT	-.193	.064	-.408	-3.030	.004
TTT	-118.554	63.658	-.325	-1.862	.070

Note: R= .543, R Square =.294 , Adjusted R Square = .294

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

West Virginia, 4-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL= INSTTUIT + CONSTANT

Table 61

Regression Analysis Coefficients, Final Model, for West Virginia, 4-Year Public[a] (N=88)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	261.441	209.401		1.249	.215
INSTTUIT	.352	.100	.356	3.532	.001

Note: R= .356, R Square =.127 , Adjusted R Square = .117

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of F (1,87) = 12.476, $p<.001$, which is below the $\alpha \leq .05$ threshold. Table 61 provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 12 percent (adjusted R^2 =.117) of the variation in enrollment is explained by the average in-state tuition (INSTTUIT). Almost 88 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the impact of average in-state tuition (INSTTUIT). The average in-state tuition had a significant and positive effect on

enrollment. Accept H_o since there was no significant long (TTT) or short (TT) term impact of the policy adoption on enrollment.

West Virginia, 2-Year Private

No significant model could be developed because there were only two observations for West Virginia's 2-year private institutions.

West Virginia, 4-Year Private

West Virginia, 4-year private did not yield any significant models from the analysis.

Research Question 4 (RQ4)

Research Question 4 (RQ4): What is the effect of the following three types of merit aid programs across similar programs by sector and level: a. Full tuition; b. Partial tuition; c. One time payment?

Full Tuition Program, 2-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL= INSTTUIT + HSGRAD + HEAPP + UNEMP + CONSTANT

The significance of $F(4, 1968) = 141.821$, $p<.001$, which is below the $\alpha \leq .05$ threshold. Table 62 provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Almost 22 percent (adjusted $R^2 = .223$) of the variation in enrollment is explained by the average in-state tuition (INSTTUIT), the

number of high school graduates (HSGRAD), higher education appropriations (HEAPP), and unemployment (UNEMP). Nearly 78 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the average in-state tuition (INSTTUIT), higher education appropriations (HEAPP), the number of high school graduates (HSGRAD), and unemployment (UNEMP). The long (TTT) and short (TT) term impact of the policy adoption were both stepped out of the equation and had no significant impact on enrollment across 2-year public institutions in states with full merit scholarship programs therefore accept H_o.

Table 62

Regression Analysis Coefficients, Final Model, for 2-Year Public Institutions Across Full Tuition Payment Merit Scholarship States[a] (N=1960)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-992.339	150.184		-6.607	.000
HEAPP	2.70E-007	.000	.201	2.992	.003
HSGRAD	.009	.002	.275	4.476	.000
INSTTUIT	.164	.040	.089	4.124	.000
UNEMP	120.711	23.301	.129	5.181	.000

Note: R= .473, R Square =.224 , Adjusted R Square = .223

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Full Tuition Program, 4-year public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL= INSTTUIT + TTT + TT + T + HEAPP + CONSTANT

The significance of $F(5, 764) = 69.470$, $p<.001$, which is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 31 percent (adjusted $R^2 = .309$) of the variation in enrollment is explained by the average in-state tuition (INSTTUIT), the long (TTT) and short (TT) term impact of the policy adoption, time (T), and higher education appropriations (HEAPP). Almost 69 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the average in-state tuition (INSTTUIT), the long (TTT) and short (TT) term impact of the policy adoptions, time (T), and unemployment (UNEMP). The long term (TTT) impact of the policy adoption had a positive but not significant impact on enrollment across 4-year public institutions in states with full merit scholarship programs. Higher education appropriations (HEAPP), the average in-state tuition (INSTTUIT) and the short term (TT) impact of the policy adoption all had a significant positive effect on enrollment across 4-year public institutions in states that had full tuition payment merit aid programs. Time (T) had a significant and negative impact on enrollment in this

sector. Reject H_o since there was a significant short (TT) term impact of the policy adoption on enrollment.

Table 63

Regression Analysis Coefficients, Final Model, for 4-Year Public Institutions Across Full Tuition Payment Merit Scholarship States[a] (N=765)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-460.720	194.186		-2.373	.018
HEAPP	1.06E-006	.000	.548	15.001	.000
INSTTUIT	.802	.081	.323	9.842	.000
T	-143.255	23.829	-.519	-6.012	.000
TT	259.746	130.915	.098	1.984	.048
TTT	59.556	33.724	.147	1.766	.078

Note: R= .560, R Square =.314 , Adjusted R Square = .309

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Full Tuition Program, 2-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL= HSGRAD + T + TTT + CONSTANT

Table 64

Regression Analysis Coefficients, Final Model, for 2-Year Private Institutions Across Full Tuition Payment Merit Scholarship States[a] (N=208)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	83.482	53.514		1.560	.120
HSGRAD	.001	.001	.128	1.802	.073
T	13.148	6.244	.411	2.106	.036
TTT	-17.812	8.372	-.414	-2.128	.035

Note: R= .196, R Square =.038 , Adjusted R Square = .024

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of F (4, 207) = 2.453, p=.047, which is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 2 percent (adjusted R^2 =.024) of the variation in enrollment is explained by the number of high school graduates (HSGRAD), time (T), and the long term (TTT) impact of the merit programs. Almost 98 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the number of high school

graduates (HSGRAD), the long term (TTT) impact of the policy adoptions, and time (T). The long term (TTT) impact of the policy adoption had a significant negative impact on enrollment across 2-year private institutions in states with full merit scholarship programs. The number of high school graduates (HSGRAD) had a positive, but not significant, effect on enrollment. Time (T) had a significant positive effect on enrollment. Reject H_o since there was a significant long (TTT) term impact of the policy adoption on enrollment.

Full Tuition Program, 4-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL= INSTTUIT + HEAPP + HSGRAD + TT + UNEMP + CONSTANT

The significance of F (5, 1174) = 73.060, $p<.001$, which is below the $\alpha \leq .05$ threshold. Table 65 provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 24 percent (adjusted R^2 =.235) of the variation in enrollment is explained by the average in-state tuition (INSTTUIT), the number of high school graduates (HSGRAD), higher education appropriations (HEAPP), unemployment (UNEMP), and the short term (TT) impact of the merit programs. Almost 76 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state.

Table 65

Regression Analysis Coefficients, Final Model, for 4-year Private Institutions Across Full Tuition Payment Merit Scholarship States[a] (N=1175)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	168.017	78.743		2.134	.033
HEAPP	-3.09E-007	.000	-.706	-5.725	.000
HSGRAD	.007	.001	.619	5.695	.000
INSTTUIT	.033	.002	.503	18.502	.000
TT	63.875	33.393	.087	1.913	.056
UNEMP	-37.243	12.337	-.109	-3.019	.003

Note: R= .488, R Square =.238 , Adjusted R Square = .235

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The standard coefficients (beta) estimates relative predictive power of the average in-state tuition (INSTTUIT), the number of high school graduates (HSGRAD), the short term impact (TT) of the policy adoptions, and unemployment (UNEMP). The short term (TT) impact of the policy adoption had a positive but not significant impact on enrollment across 4-year private institutions in states with full merit scholarship programs. Higher education appropriations (HEAPP) and the unemployment rate (UNEMP) both had a significant negative impact on enrollment. Finally, the number of high school graduates (HSGRAD) and the average in-state tuition (INSTTUIT) both had

a significant positive effect on enrollment across 4-year private institutions in states that had full tuition payment merit aid programs. Accept H_0 since there was no significant long (TTT) or short (TT) term impact of the policy adoption on enrollment.

Partial Tuition Program, 2-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL= HEAPP + T + TT + TTT + HSGRAD+ CONSTANT

The significance of F (5, 1575) = 13.719, $p<.001$, which is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 4 percent (adjusted $R^2 = .039$) of the variation in enrollment is explained by the higher education appropriations (HEAPP), the number of high school graduates (HSGRAD), time (T), and the short (TT) and long (TTT) term impact of the policy adoption. Almost 96 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the higher education appropriations (HEAPP), the number of high school graduates (HSGRAD), time (T), and the short (TT) and long (TTT) term impact of the policy adoption. Higher education appropriations (HEAPP) and the short (TT) and long (TTT) term impact of the policy adoption all had a significant positive impact on enrollment in 2-year public institutions in states with partial tuition payment merit aid programs. The number of high school graduates (HSGRAD) and time (T) both

had a significant negative effect on enrollment. Reject H_0 since there was a significant long (TTT) and short (TT) term impact of the policy adoption on enrollment.

Table 66

Regression Analysis Coefficients, Final Model, for 2-Year Public Institutions Across Partial Tuition Payment Merit Scholarship States[a] (N=1576)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	1151.449	74.737		15.407	.000
HEAPP	5.02E-007	.000	.206	5.017	.000
HSGRAD	-.013	.002	-.240	-6.051	.000
T	-105.694	17.027	-.594	-6.207	.000
TT	155.230	59.514	.110	2.608	.009
TTT	105.823	18.666	.472	5.669	.000

Note: R= .205, R Square =.042 , Adjusted R Square = .039

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Partial Tuition Program, 4-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL= HEAPP + INSTTUIT + T + CONSTANT

Table 67

Regression Analysis Coefficients, Final Model, for 4-Year Public Institutions Across Partial Tuition Payment Merit Scholarship States[a] (N=854)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	553.409	97.376		5.683	.000
HEAPP	6.95E-007	.000	.214	5.974	.000
INSTTUIT	.156	.031	.190	4.972	.000
T	-27.489	7.417	-.129	-3.706	.000

Note: R= .329, R Square =.108 , Adjusted R Square = .105

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of F (3, 853) = 34.413, $p<.001$, which is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 11 percent (adjusted $R^2 = .105$) of the variation in enrollment is explained by the average in-state tuition (INSTTUIT), time (T), and higher education appropriations (HEAPP). Almost 89 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the average in-state tuition (INSTTUIT), time (T),

and higher education appropriations (HEAPP). Higher education appropriations (HEAPP) and the average in-state tuition (INSTTUIT) both had a significant positive effect on enrollment across 4-year public institutions in states that had partial tuition payment merit aid programs. Time (T) had a significant negative impact on enrollment in this sector. Accept H_o since there was no significant long (TTT) or short (TT) term impact of the policy adoption on enrollment.

Partial Tuition Program, 2-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL= INSTTUIT + TT + CONSTANT

The significance of $F(2, 196) = 15.561$, $p<.001$, which is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 13 percent (adjusted $R^2 = .129$) of the variation in enrollment is explained by the average in-state tuition (INSTTUIT) and the short (TT) term impact of the policy adoption. Almost 87 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the average in-state tuition (INSTTUIT) and the short term (TT) impact of the policy adoption. Average in-state tuition (INSTTUIT) had a significant positive impact on enrollment in 2-year private institutions in states with partial tuition payment merit aid programs. The short term (TT) impact of the merit aid

policies was significantly negative. Reject H_0 since there was a significant short (TT) term impact of the policy adoption on enrollment.

Table 68

Linear Regression Analysis Coefficients, Final Model, for 2-Year Private Institutions Across Partial Tuition Payment Merit Scholarship States[a] (N=197)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	87.023	21.914		3.971	.000
INSTTUIT	.018	.003	.365	5.425	.000
TT	-43.555	21.809	-.134	-1.997	.047

Note: R= .372, R Square =.138 , Adjusted R Square = .129

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Partial Tuition Program, 4-year private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL= UNEMP + HEAPP + INSTTUIT + HSGRAD + CONSTANT

Table 69

Regression Analysis Coefficients, Final Model, for 4-Year Private Institutions Across Partial Tuition Payment Merit Scholarship States[a] (N=1687)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	189.446	42.127		4.497	.000
HEAPP	-2.02E-007	.000	-.207	-6.862	.000
HSGRAD	.002	.001	.096	3.408	.001
INSTTUIT	.024	.001	.483	20.099	.000
UNEMP	-13.062	5.369	-.057	-2.433	.015

Note: R= .457, R Square =.209 , Adjusted R Square = .207

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of F (4,1686) = 110.861, $p<.001$, which is below the $\alpha \leq .05$ threshold. Table 69 provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 21 percent (adjusted R^2 =.207) of the variation in enrollment is explained by the average in-state tuition (INSTTUIT), the number of high school graduates (HSGRAD), unemployment (UNEMP), and higher education appropriations (HEAPP). Almost 79 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of the average in-state tuition (INSTTUIT), the number of high school graduates

(HSGRAD), unemployment (UNEMP), and higher education appropriations (HEAPP). Higher education appropriations (HEAPP) and the unemployment rate (UNEMP) both had a significant negative effect on enrollment across 4-year private institutions in states that had partial tuition payment merit aid programs. Average in-state tuition (INSTTUIT) and the number of high school graduates (HSGRAD) both had a significant positive effect on enrollment across 4-year private institutions in the partial payment merit aid states. Accept H_o since there was no significant long (TTT) or short (TT) term impact of the policy adoption on enrollment.

One Time Payment, 2-Year Public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= HEAPP + HSGRAD + INSTTUIT + T + TT + TTT + UNEMP

Final model: ENROLL = HSGRAD + INSTTUIT + UNEMP + CONSTANT

The significance of $F(3,248) = 18.053$, $p<.001$ is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. More than 17 percent (adjusted $R^2 = .171$) of the variation in enrollment is explained by average in-state tuition (INSTTUIT), unemployment (UNEMP), and the number of high school graduates (HSGRAD). Almost 83 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of average in-state tuition (INSTTUIT), unemployment (UNEMP), and the number of high school graduates

(HSGRAD). The impact of average in-state tuition (INSTTUIT) was negative and significant. The impact of the number of high school graduates (HSGRAD) and unemployment (UNEMP) were both positive and significant for 2-year public institutions. Accept H_o since there was no significant long (TTT) or short (TT) term impact of the policy adoption on enrollment.

Table 70

Regression Analysis Coefficients, Final Model, for One Time Payment, 2-Year Public[a] (N=249)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	-1864.295	400.342		-4.657	.000
HSGRAD	.051	.008	.450	6.740	.000
UNEMP	66.326	25.843	.151	2.566	.011
INSTTUIT	-.188	.033	-.376	-5.660	.000

Note: R= .425, R Square = .181, Adjusted R Square = .171.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

One Time Payment, 4-year public

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = INSTTUIT + T + CONSTANT

Table 71

Regression Analysis Coefficients, Final Model, for One Time Payment, 4-Year Public[a] (N=168)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	581.529	228.863		2.541	.012
T	-46.305	24.739	-.176	-1.872	.063
INSTTUIT	.326	.085	.361	3.829	.000

Note: R= .289, R Square = .083, Adjusted R Square = .072.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

The significance of $F(2, 167) = 7.511$, $p<.001$ is below the $\alpha \leq .05$ threshold. Table 71 provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. More than 7 percent (adjusted $R^2 = .072$) of the variation in enrollment is explained by average in-state tuition (INSTTUIT) and time (T). Nearly 93 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of average in-state tuition (INSTTUIT) and time (T). The impact of the time (T) on enrollment was negative but

not significant and the impact of average in-state tuition (INSTTUIT) was positive and significant for 4-year institutions. Accept H_o since there was no significant short (TT) or long (TTT) term impact on enrollment.

One Time Payment, 2-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = HSGRAD + T + CONSTANT

The significance of $F(2,64) = 3.690$, $p<.031$ is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. Nearly 8 percent (adjusted $R^2 = .078$) of the variation in enrollment is explained by time (T) and the number of high school graduates (HSGRAD). Almost 82 percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of time (T) and the number of high school graduates (HSGRAD). The impact of high school graduates (HSGRAD) on enrollment was significantly negative while the impact of time was positive and significant for 2-year private institutions. Accept H_o since there was no significant long (TTT) or short (TT) term impact on enrollment.

Table 72

Regression Analysis Coefficients, Final Model, for One Time Payment, 2-year private[a] (N=65)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	3066.463	1344.091		2.281	.026
HSGRAD	-.066	.030	-1.033	-2.203	.031
T	73.684	29.051	1.189	2.536	.014

Note: R= .326, R Square = .106, Adjusted R Square = .078.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

One Time Payment, 4-Year Private

Ho: $b_b - b_a = 0$, the policy adoption did not have a significant effect on enrollment.

Ha: $b_b - b_a \neq 0$, the policy adoption did have a significant effect on enrollment.

The entry and final regression models are:

Entry model: ENROLL= T + TT + TTT+ HEAPP + HSGRAD + UNEMP + INSTTUIT

Final model: ENROLL = HEAPP + INSTTUIT + UNEMP + CONSTANT

The significance of F (3, 443) = 56.247, $p<.001$ is below the $\alpha \leq .05$ threshold. The figure below provides the unstandardized coefficients, standardized coefficients, and standard error for the final model. More than 27 percent (adjusted $R^2 = .272$) of the variation in enrollment is explained by average in-state tuition (INSTTUIT), unemployment (UNEMP), and higher education appropriations (HEAPP). Nearly 72

percent of the variance is due to other factors other than the variables included in the entry model which were stepped out as not significant in this state. The standard coefficients (beta) estimates relative predictive power of unemployment (UNEMP), average in-state tuition (INSTTUIT), and higher education appropriations (HEAPP). The impact of the higher education appropriations (HEAPP) and unemployment (UNEMP) on four year private enrollment were significant and negative. However, the impact of the average in-state tuition (INSTTUIT) was positive and significant. Accept H_0 since there was no significant long (TTT) or short (TT) term impact on enrollment.

Table 73

Regression Analysis Coefficients, Final Model, for One time payment, 4-year private[a] (N=444)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Final Model	B	Std. Error	Beta		
(Constant)	561.586	169.366		3.316	.001
HEAPP	-4.44E-007	.000	-.231	-3.876	.000
UNEMP	-55.877	20.026	-.162	-2.790	.005
INSTTUIT	.037	.003	.555	12.987	.000

Note: R= .526, R Square = .277, Adjusted R Square = .272.

[a] Dependent Variable: First time undergraduate enrollment (ENROLL), $\alpha = .05$

Summary

Chapter 5 presented the graphs of the time series data and the results of the time series regression analyses of the data. In all, the longitudinal data for each sector in the 15 states in this study were graphed to determine the onset and duration of the impact the policy adoption had. The analysis consisted of a backward multiple linear regressions to identify the predictive value and relationship between the merit aid policy adoption and first time undergraduate enrollment in the 15 states that have adopted these policies and across the three types of merit aid programs.

Based on Long's (2003) work on the impact of the Georgia HOPE Scholarship on institutions and tuition, three variables were identified as having significant impact: state higher education appropriations, unemployment, and average tuition for in-state students. Because the number of high school graduates in a state is directly linked to the number of potential candidates for undergraduates, this study also accounts for the number of public high school graduates in each state.

Research question 3 was an examination of the impact of the policy adoption on the four sectors within each state that has a merit aid policy. The policy adoption had a significant short term impact on enrollment in four cases. In Alaska and Washington, there was a significant positive relationship between the adoption of the policy at the state level and short term enrollment in 2-year public institutions. In Kentucky, there was a significant positive relationship between the policy adoption and short term enrollment in 2-year private institutions in that state. And, in Nevada there was a negative relationship between the policy adoption and the short term enrollment at the 2-year private sector institution.

There was a significant long term impact of the policy adoption on 2-year public institutions in four cases. In Alaska, Louisiana, and West Virginia, there was a significant negative relationship between the policy adoption and enrollment in the 2-year public institutions. In Washington, there was a significant positive relationship between the policy adoption and enrollment in the 2-year public intuitions. There was a significant long term impact on 2-year private institutions in two cases. In Arkansas, there was a negative relationship between the policy adoption and enrollment at 2-year private institutions. In Florida, there was a positive relationship between the implementation of the policy and enrollment at 2-year privates. The impact on 4-year public institutions interestingly only had a significant impact in one state, Missouri, which had a negative relationship. The long term impact of the policy adoption on 4-year private institutions was significant in only three states, Arkansas, Florida, and West Virginia, all three of which were negative.

Research question 4 was an examination of the impact of merit aid programs across similar programs by sector and level. There was no significant long or short term impact on enrollment in 2-year public or 4-year private institutions after the policy adoption of full payment tuition plans. Full tuition merit scholarship programs did have a significant long term negative effect on enrollment at 2-year private institutions across the six states with these programs. 4-year public institutions were significantly and positively impacted by the full tuition merit aid policies.

Partial tuition programs did not have a significant impact on enrollment in 4-year public and private institutions. There was no significant long or short term impact on enrollment in 2-year private institutions after the adoption of partial tuition payment

plans. There was a significant and positive long and short term effect at 2-year public institutions across the six states that have adopted the partial payment programs.

Finally, in the state that had a one time payment program, there was no significant effect on enrollment in any of the sectors (2, 4-year, public or private).

CHAPTER 6

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This final chapter begins with a broad presentation of each research question and broad interpretation of the results. Then, the findings are supported using specific state examples or results. Finally, implications for higher education policy are discussed as are recommendations for future study. For this study, 'long term effect' means that there was a significant impact on enrollment from year-to-year after the policy adoption, whereas the 'immediate impact' or 'short term effect' is the impact of the policy adoption on just the first year after implementation.

Summary of Results

Research question 1: How has merit aid impacted first time undergraduate postsecondary participation in each of the states that has adopted this student financial aid policy?

Research question one (RQ1) is a state level analysis of how merit aid has impacted first time undergraduate postsecondary participation in each of the states that have adopted these student financial aid policies. The overall impact of the adoption of the merit aid policies is that they have had a significant effect on enrollment across nine of the fifteen states in this study. Specifically, they have had a significant positive, immediate effect on enrollment across Florida, Tennessee, and West Virginia but a

significant negative, immediate effect on enrollment in Nevada and Alaska. The long term effect has been significant and positive in Alaska, Florida, Kentucky, Louisiana, Missouri, and New Mexico but significantly negative in Arkansas, (see Appendix D for full results). There was no significant long or short term effect in only three states, Georgia, Michigan, Mississippi, and South Carolina.

Merit aid programs, at a state level, seem to have a positive impact on enrollment which could be because they encourage participation somewhere in the system. Another possibility is that as states prepare for these initiatives, there is generally more public discussion about college costs, participation, and preparation. As issues rise to the forefront of public discussion, the level of the general knowledge around the issue increases. In this case, as more publicity surrounds the adoption of the merit aid policies, students and parents are more likely to have discussions about postsecondary education and paying for college.

In addition to the impact of the policy adoption, unemployment had an impact on participation across six of the states in this study. Unemployment had a significant negative impact in Nevada and Alaska and a significant positive effect in Arkansas, Georgia, Mississippi, and South Carolina. It could be that there was a significant negative relationship between unemployment and enrollment in Nevada and Alaska because in these states, higher education is not necessarily associated with employment as strongly as it is in other states. Particularly in Nevada, with a large proportion of the population employed in the construction and service industries, education might not offer the same incentive as it does in other states.

In South Carolina, there was no significant change in enrollment upon the

adoption of the first merit aid policy, which may explain why there was another program adopted less than five years later. The second set of merit aid policies that was adopted in South Carolina had a significant positive impact on enrollment. Where most states have adapted their merit aid policies to allow for differential awards by sector, South Carolina has taken the approach of writing new legislation for new award programs. There are currently four different merit scholarships available in South Carolina. The interaction effects of these four scholarship programs make it difficult to determine the impact of any one of the programs at this broad level of analysis. One assumption of time series analysis is that there are no other alternative explanations for the phenomenon. In the case of South Carolina, there are clearly several different legislative initiatives in higher education occurring simultaneously.

In Washington, there was not a significant effect on enrollment upon adoption of the merit aid policy which may have been a factor in why the program ended on June 30, 2006. The award amount in Washington was $1,254.00, whereas the 2005 average 4-year public tuition was $4,630; 2-year public was $2, 230; and 4-year private was $18,300. This payment was significantly less than 50 per cent in terms of proportion of tuition paid by the award, which may explain why students did not respond by enrolling at significantly higher numbers.

There was one state where the adoption of the merit aid policy had a significant negative long-term impact on enrollment—Arkansas. It is evident from the graph of enrollment in Arkansas that there are large fluctuations in enrollment from year to year. There were five data points before the policy adoption and thirteen after, which may not be sufficient data for enrollment trends pre-policy adoption. A longer pre-policy

adoption time series might show that over a longer period, the impact of the policy is in fact positive or neutral. Arkansas requires that students take a core set of courses in high school, achieve a minimum grade point average, and ACT or SAT score. Additionally, unlike most of the merit aid programs in other states, Arkansas has a $60,000 family income cap for recipients with one child, and makes additional allowances for families with more children (Arkansas Department of Higher Education, 2006). An unintended consequence of the family income cap is that it could also contribute to the decline in enrollment because students who are eligible in merit but exceed the income cap may be selecting schools in other states because they did not receive the grant to stay in Arkansas.

The short term impact of the merit aid policies was mixed; in Florida, Tennessee and West Virginia, the adoption of the merit aid policies had a significant positive effect on short-term enrollment. Tennessee and West Virginia adopted their policies less than five years ago and so are only used as an indicator of the initial enrollment response. The incentive effect of merit aid policies across the states appears to gain momentum rather than to have a sudden consistent impact on college going. Part of the reason for the lag in student enrollment response is that the criterion for an award is based on four years of performance (grade point average) or a score on a test (ACT or SAT) taken in the junior year, both events that took place before the legislation. In Alaska and Nevada, the short term impact was significant and negative. As with all legislation, when merit aid policies are adopted in states, financing does not necessarily immediately accompany the legislation. In the case of merit aid, because these programs can be cumbersome and expensive to implement, there can be a lag in the response by students because of

structural issues with the programs.

Research Question 2: What is the effect of the following three types of merit aid programs on first time undergraduate enrollment across states (a) full tuition payment programs, (b) partial tuition payment programs, (c) one time payment programs?

Full Tuition Payment Programs

In the aggregated states where there was a full tuition payment policy adopted, there was no significant long or short term impact of the policy adoption on enrollment. There is a significant increasing enrollment trend in the full tuition payment states over time (T) that is unrelated to the policy adoption. Higher education appropriations (HEAPP), the number of high school graduates (HSGRAD), and unemployment (UNEMP) all significantly affected enrollment in the full tuition payment merit aid states. Higher education appropriations are a reflection of the general fiscal welfare of the state and its citizens. Earlier studies have shown that merit aid disproportionately benefits students that come from advantaged backgrounds who are already likely to go to college (Cornwell, Mustard, & Sridhar, 2003; Dynarski, 2003; Heller & Rasmussen, 2003). By extension, the adoption of a merit aid policy might not have a significant enrollment effect in states with higher appropriations. In states where full merit aid policies are adopted, unemployment (UNEMP) had a significant positive effect on postsecondary enrollment. In states where education is a clear vehicle to better paying jobs, going to college right after high school makes sense. Since there is a significant positive relationship between the number of high school graduates and undergraduate enrollment in these states, it appears that students are doing just that.

Finally, in full tuition payment policy states, the average in-state tuition (INSTTUIT) had a significant negative effect on enrollment. There is a history of research that supports the finding that as tuition rises, the number of students enrolling decreases. What is interesting about this case is that the relationship persists even in states where there is a full tuition payment program in place to defray tuition costs. In her 2003 study of how Georgia institutions responded to the adoption of the HOPE scholarship policy, Long found that institutions may have increased fees, room and board, and other associated costs rather than just tuition. The linkage between rising tuition and associated fees may be a phenomenon that is occurring across all of the full tuition payment merit aid states.

Partial Tuition Payment Programs

The aggregated state level analysis found that the partial tuition payment programs had no significant immediate impact but that they did have a significant negative long term impact on enrollment. One possible explanation for the negative long term results where the partial tuition programs are in place is that there is wide variation between policies across the states as well as within the same state policy from year to year. There are two main areas of variance across partial tuition payment merit aid programs—selection criteria and award amount. For example, in Nevada the criterion for award was a 3.0 grade point average at a Nevada high school whereas in Washington, students were required to be in the top 15% of their graduating class. That difference in criteria alone would likely lead to significant differences in the number of students eligible for the merit awards and the impact on enrollment, especially across states that are pooled together for analytical purposes.

Another possible reason that the policy adoption across partial payment merit aid states has had a negative impact on enrollment is that the eligibility requirements for the merit aid scholarships have changed in almost every state since their adoption. One of the reasons for the changes in eligibility criteria is that the money to pay for the scholarships comes from limited resources such as tobacco dollars or lottery revenues, with only a very few states using general revenues. As the number of students eligible for the award increases faster than the revenues is growing, states are forced to make decisions about how to stretch limited resources by either reducing the amount of award or the number of eligible students.

Like the full tuition payment states, the partial tuition payment states also demonstrated significant positive relationships between enrollment and higher education appropriations, the number of high school graduates, and unemployment. It is likely that the same reasons behind the positive relationship between enrollment and appropriations (wealth), graduates (supply and preparation), and unemployment (incentives) in the full tuition states are the same underlying causes of the significant relationships in the partial tuition states.

One Time Payment

The analysis of the single one time payment state, Michigan, revealed that there was not a significant long or short term impact of the policy adoption on enrollment. The one time tuition payment in this state is only $2500, significantly less than the average cost of tuition at a 4-year public institution in the state. Since the policy is a one time payment, and it is the only state with that policy, it is not possible to determine if that alone is the reason that there was no incentive effect. However, in their 2003 study of

the incentive effect of Michigan's merit aid policy, Heller and Rogers speculated that this relatively low one time payment did not sufficiently off-set the cost of tuition enough to serve as an incentive to enroll.

Research Question 3: How much has merit aid impacted participation by sector and level in the states that have adopted this financial aid policy?

2-Year Public Sector

There was a significant increase in student enrollment in the 2-year public institutions immediately after the adoption of the merit aid policies in Alaska and Washington. Many of the states did not have any effect after the adoption of the merit aid program. The 2-year public enrollment did not immediately significantly decline in any of the states. However, there was a significant negative effect of the merit aid adoption over a longer period in Alaska, Louisiana, and West Virginia. This is an important finding because earlier work on merit aid suggested that it pulls students from 2-year institutions up to the 4-year institutions (Dynarski, 2002). This study suggests that while that might be the case over long periods of time, it is not the immediate impact of the program. Furthermore, if students who were not inclined to enroll are more likely to enroll at 2-year institutions because of merit aid, they could be taking the place of those students who are now incentivized to move up to 4-year institutions.

Average in-state tuition (INSTTUIT) significantly positively influenced enrollment in 2-year public institutions in Arkansas, Georgia, Kentucky, Louisiana, New Mexico, and Tennessee. A likely reason is that as tuition in 4-year institutions raises, students enroll in the less expensive 2-year institutions. Additionally, unemployment (UNEMP) had a significant positive effect on enrollment in 2-year public institutions.

This finding is not surprising, as 2-year public institutions are often where workers turn to retool for new jobs. Finally, since 2-year public institutions are a place where many students begin their postsecondary educational journey, it is not surprising to find that the number of high school graduates (HSGRAD) is also positively associated with 2-year public enrollment in Georgia, Michigan, and Washington.

4-Year Public Sector

Across nearly every state, the adoption of the merit aid policies do not have a significant short or long term impact on 4-year public enrollment. Part of the reason that there was no significant effect of the merit aid adoption on enrollment in this sector may be that many 4-year public institutions are at or near capacity and do not have room to take significantly more students. Another reason may be that the students that benefit from these programs are students that would enroll at 4-year public institutions regardless of the merit aid adoption. In their examination of the New Mexico Lottery Scholarship program, Binder, Ganderton, and Hutchens (2001) found that the merit aid policy did not influence whether students went to college or not but rather where they went to college.

The average in-state tuition (INSTTUIT) has a significant positive impact on enrollment in the 4-year sector in Arkansas, Georgia, Kentucky, Louisiana, Michigan, Missouri, Mississippi, New Mexico, and West Virginia. As average in state tuition increases in these nine states, the number of students that enroll in 4-year public institutions also significantly increases. One reason could be that parents and students are aware of the benefits of higher education and believe that the cost will not go down in the future. Hoping to take advantage of current prices, students enroll despite rising tuition costs. Another possibility simply concerns supply and demand. Student enrollment

demand for the 4-year sector in these states may be higher than the spaces available (supply). An economic consequence of an imbalance whereby demand is greater than supply is a rise in prices (tuition). If this is the case in these states, students demand is inelastic relative to other states.

Nevada was the only state in which there was a significant negative effect of the average in-state tuition on enrollment. Here again, Nevada is a state in which the perceived return on higher education is less than that of other states so when tuition rises, enrollment in the 4-year public institutions decreases.

The adoption of a merit aid policy had a significant negative long term effect on enrollment in the 4-year public sector in Missouri. The merit scholarship program in Missouri offers the top three percent of students who take the ACT or SAT in Missouri one thousand dollars per semester twice per year for up to ten semesters (Missouri Department of Higher Education, 2006). It is highly likely that these same students are being recruited to private institutions or institutions in other states because of their academic successes.

2-Year Private Sector

The adoption of a merit aid policy had a significant effect on enrollment across two states—Arkansas and Kentucky. In Arkansas, there was a significant negative effect of the merit aid adoption on enrollment in the 2-year private sector. Kentucky experienced a positive, immediate impact on enrollment but there was no significant long term effect. It should be noted that in the case of Kentucky, there was only one 2-year private institution's data that were included in this study. That is not to say that there is only one 2-year private institution in the state, but rather this sector did not consistently

report its enrollment data. For a list of all of the institutions that were omitted from this study due to missing data, please refer to Appendix E.

4-Year Private Sector

The adoption of a merit aid policy had a significant negative impact on enrollment across the 4-year private sector in two states, Arkansas and West Virginia. The enrollment in the 4-year private institutions in Arkansas, Florida, and West Virginia dropped over the long run (TTT) as a result of the adoption of the merit aid policies in those states. For the majority of states, there was no significant impact on enrollment in the 4-year private as a result of the scholarship program adoption. There were no states where there was a significant immediate drop in enrollment as a result of a merit aid policy adoption. One reason that there was not a significant effect may be that in many 4-year private institutions, there are sufficient institutional grant dollars to recruit high achieving students. Often, students enroll at 4-year private institutions for their prestige, regardless of cost.

This study found that there is a significant decreasing trend in enrollment over time (T) at the 4-year private institutions in Arkansas, Florida, Georgia, Mississippi, Tennessee, and West Virginia, all other variables constant.

Table 74

Impact of Policy Adoption by Sector

	Sector			
Impact	2-Year Public	4-Year Public	2-Year Private	4-Year Private
Short Term (TT)	AK +		KY +	
	WA +			
Long Term	AK –	MO –	AR –	AR –
(TTT)	LA –		FL +	FL –
	WA +			WV –
	WV –			

+ there was a significant positive impact, -- there was a significant negative impact.

Another variable that was significant in Arkansas, Florida, Georgia, Kentucky, Louisiana, Michigan, Mississippi, Nevada, South Carolina, and Tennessee was the average in state tuition (INSTTUIT), which had a significantly positive effect on enrollment in the 4-year private institutions. One reason that this may be the case is that in several states, enrollment in private institutions is allowed as part of the merit aid grant. Another possible reason that enrollment in private 4-year institutions rises as tuition increases may be that students begin to view private institutions as a viable alternative past a certain tuition cost.

Research Question 4 (RQ4): What is the effect of the following three types of merit aid programs across similar programs by sector and level: (a) Full tuition; (b)

Partial tuition; (c) One time payment?

Full Tuition Policies

The analysis of the impact of the policy adoptions in the four sectors across states with similar merit aid programs shows that the full tuition programs have a significant impact on the 2-year private and 4-year pubic sectors. There was no significant model for the 2-year public or the 4-year private sectors.

The 2-year private sector enrollment significantly decreases over the long term (TTT) as a result of the full tuition policy adoption across all full tuition states in this study. One reason for this may be that the merit aid programs educate students about their alternatives before they select an institution. Another reason may be that these institutions are not eligible to receive merit aid money so students that receive the grants select institutions in either the public or the 4-year private sectors.

There was a significant short term (TT) increase in enrollment in the 4-year public sector as a result of the adoption of a full tuition payment across the states in this study. One reason for this may be that the publicity of the programs increases awareness, which encourages students to go to college. However, the momentum is not sustained, as there was not a significant long term effect (TTT).

Partial Tuition Policies

The states with partial tuition programs had a significant positive long and short term enrollment effect at the 2-year public sector across the states. In other words, the effect of the policy adoption in the partial tuition states was immediate and long term in the 2-year public sector. It is likely that the 2-year public sector is where students, who otherwise would not have considered college before the merit aid policy adoption,

matriculated. The publicity that surrounds the adoption of merit aid policies in states can encourage first generation students and parents to think about and plan for college. A marginal payment may not encourage people to believe they can afford a 4-year institution, but it is enough for them to be encouraged to attend a 2 year. That there were significant immediate and long terms effects on enrollment in the 2-year sector after merit aid adoption supports this suggestion.

One Time Payment Policies

In Michigan, the one state with a one time payment program, there were no significant effects of the adoption of the merit aid policy in any of the sectors across the state. It seems as though this supports the assertion that the combination of amount of award ($2500) and length of time of support (one year) do not serve as an effective incentive for participation in postsecondary education. Another possible explanation is that students are enrolling at the next most prestigious level of institution and new students are entering the pipeline through 2-year public institutions so that the end result is no significant changes in enrollment in any of the sectors across the state. Table 78 (below) summarizes the significant findings concerning the impact of the three merit aid policy types across states by sector.

Table 75

Impact of Policy Type by Sector

	Sector			
Policy Type	2-Year Public	4-Year Public	2-Year Private	4-Year Private
Full Tuition Program		Short Term+	Long Term-	
Partial Tuition Program	Long Term+ Short Term+		Short Term-	
One Time Payment Tuition Program				

+ denotes a significant positive effect, - denotes a significant negative effect.

Comparison with Existing Literature

Results of this study were largely consistent with the research literature on the impact of merit aid on postsecondary student enrollment. As in other previously reported research, state wide adoption of a merit aid policy had a significant effect on student enrollment (Heller, 1999; Farrell, 2004). Much of the existing research on merit aid is devoted to understanding how state policies effect student enrollment by group, systems, and institutions. This study provides a state level examination across states and across similar merit aid programs thereby expanding the work done by Farrell (2004), Dynarski (2003) and Heller (1999), among others. Farrell conducted an evaluation of the merit aid programs in her 2004 dissertation and recommended further examination at the sector

level. Dynarski conducted a state level examination of the merit aid programs in her 2003 study, but limited her study to those in the Southern Regional Education Board (SREB) states. Heller's 1999 study examined the impact of merit aid studies using a cross sectional time series analysis of the states that had the policies at that time. This current study includes more states than any of the previous studies and examines the impact one level deeper by including a sector level analysis.

Previous analyses of the impact of merit aid on sector enrollment found that students responded to the combination of financial aid along with the tuition increases that often accompany these policies (Heller, 1999; Perna & Titus, 2004; Kane, 1999). This study supports those findings, but adds more detail to the general claims of the previous work, as demonstrated by the long and short term increase in enrollment at the 2-year public institutions with the adoption of partial merit aid programs.

McLendon, Heller, and Young (2006) as well as Cohen-Vogel and Ingle (2006) conducted examinations of how these state policies transfer across state lines and how they come to be adopted in neighboring states. However, merit aid policy transfer is not limited to crossing just state borders; Canada now has a Millennium Scholarship similar to the merit aid programs in the United States. Canada is not alone; Heller and Rogers (2004) present implications of the policy transfer of similar higher education policies in the European Union. Research on how these policies impact regions, institutions, and students will become increasingly more important as merit aid grows in its utility as a policy tool across the world. While overall, merit aid policies do increase enrollment across states, the impact of the merit aid on institutions and sectors can vary depending on the type of policy that is adopted.

Implications for Policy

The context of the state may override merit aid policy adoptions as in Arkansas and Nevada. However, there is evidence that long-term effects on enrollment are positive, especially at the broad state level. Questions remain concerning increased enrollment for whom. The impact of merit scholarships on minority enrollment has been examined by several researchers with the preponderance of evidence finding that underrepresented students in higher education remain underrepresented in the merit scholarship programs (Farrell, 2004; Cornwell & Mustard, 2002, 2004; Dynarski, 2002; Binder, Ganderton, & Hutchens, 2002). Also, if policy makers want to utilize a certain sector for cost savings, there is evidence that this may have some credibility. For example, if states wish to encourage citizens to go to community colleges because of fiscal austerity, they may be able to deemphasize expensive university enrollment. This study shows that a partial payment plan encourages two-year enrollment and can therefore offer a viable alternative to legislators. It is important to note, however, that a full payment plan may not have the same effect on shifting enrollment in the same manner, across sectors.

This study also provides a sector level examination across and within states such that policy makers and higher education administrators would be able to use the models to predict the changes in enrollment in their state or sector. It is important that state legislators understand the impact of these policies at the sector and state level for two main reasons. The first is that as legislators determine whether or not to adopt or adapt their merit aid policies, they need to consider the higher education capacity in their state. If policy makers adopt policies that exclude private sectors, this study shows that there

can be a negative impact on the private sector institutions in the state. Also, there is reason to believe that despite the type of merit aid policy, the amount of the award matters, as demonstrated by Washington and Michigan. In other words, not only should the policy provide incentive for the first year, but it appears as though the amount of support through the later years also matters.

Higher education administrators need to be aware of how these policies impact their institutions and be able to prepare for changes that may arise as a result of the adoption of a merit aid policy; this study helps them to do that. By providing models that administrators can utilize in their states to predict enrollment changes, administrators can allocate resources to accommodate increases in enrollment. Additionally, if the model predicts that there will be a decrease in a sector as a result of the adoption; administrators can play an active role in determining the sectors that are eligible in the allocation of the awards.

Implications for Future Research

The states in which there was no significant impact of merit aid on enrollment bring to light some of the shortcomings of this pooled and time series regression. First, by using self reported secondary data, several issues arise. The data are at the discretion of the person or institution that is doing the reporting. Since these data cannot be verified by an outside source, there is no way to determine if the numbers are accurate for any given year. Additionally, because reporting of these data was not required until 1992, there were several institutions that did not report their early data (NCES, 2006). Finally, institutions that did not have Program Participation Agreements (PPAs) with the U.S. Department of Education did not have to complete the survey in any year. These

agreements are in place for institutions that receive federal funding under Title IV of the Higher Education Act. As a result of these data issues, this study may not fully capture the impact of the merit aid adoptions on private institutions since the institutions in this sector made up the bulk of the un- or underreported data.

In the case of Georgia, there was a single year of data (2000) that was an outlier that was not removed from the analysis. Since these data were not smoothed, this outlier had a larger effect on the regression line than it would if these data year were discarded or smoothed. A follow up analysis of the smoothed state data using the centered moving average revealed that the impact of time (T) and unemployment (UNEMP) on enrollment (ENROLL) were both significantly positive. This analysis shows that by maintaining the outlier in the analysis, even smoothed, there is a still a significant negative impact of the adoption on enrollment in Georgia.

Another issue with this study is that because there were high correlations between the independent variables, there may be multicollinearity. For example, there is a consistently high correlation between time (T) and the long term effect variable (TTT) due to the way that they were coded. Because of the nature of this study, measuring change over time, it was necessary to include both variables despite the multicollinearity that may exist.

There are several ways in which this study can be improved upon and expanded. The first is that by having only three broad characterizations of the merit aid policy, the estimate of the effects on enrollment are overly generalized. The exact amount of the award as a predictor of enrollment might provide a clearer picture of the enrollment response. A case can also be made for including the criteria of the award programs as an

indicator of enrollment, similar to the study done by Heller (2004). A study that examines the programs by selection criteria or award amounts would be useful for determining how these factors influence enrollment in merit aid states. Another useful examination might be to characterize the merit programs by amounts rather than payment types, which would lead to a finer differentiation of programs and their effects.

One important aspect of research on merit aid is what happens to students once they are enrolled. This study does not include students beyond their first year, but a more thorough examination of student retention, transfer, and remedial course taking would provide even more insight as to the student response to state policies. St. John and Starkey (1995) and St. John (2004) conducted earlier studies of the persistence of students receiving financial aid but a study of the year to year retention throughout the merit aid states has yet to be thoroughly examined.

In order to better understand the choices that students are making in response to merit aid policies, one of the best places to turn for information is the students themselves. An additional recommendation to improve this research is to conduct a qualitative study of how and when students generally find out about the programs, how they think about selecting a college once they decide they want to try to get a merit scholarship, how they perceive their institutional and sector level choices, and if there is a strategy about how they will take advantage of the opportunity. A similar study could be done of university administrators from the various sectors to determine if there are differences in how they perceive merit aid programs and the impact on their institutions and sectors.

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