ABSTRACT

Title of Document: THE EFFECT OF STATE MERIT-BASED FINANCIAL AID ON COLLEGE PRICE: AN ANALYSIS OF FLORIDA POSTSECONDARY INSTITUTIONS

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This study extends two bodies of research, one that analyzes institutional price response to student financial aid and a second that examines the effect of state merit-based aid programs on institutions, by examining changes in tuition and fees, room and board charges, and institutional aid expenditures following the introduction of the Bright Futures merit-based aid program in Florida. Applying an economic theoretical framework to postsecondary education pricing, this study explores how institutions respond to the introduction of a new aid subsidy and how this response varies for different types of postsecondary institutions. Using descriptive and ordinary least squares regression analyses that include year fixed-effects and other controls, this study uses institutional data for the 1993-1994 to 2000-2001 academic years from the Integrated Postsecondary Education Data System and the Florida Bright Futures program to explore postsecondary price changes in Florida relative to a control group of institutions in selected southeastern states.

The findings show that the introduction of Bright Futures was associated with an increase in tuition and fees at public four-year and public two-year institutions in Florida as well as an increase in room and board rates in public four-year institutions in Florida but no change in price at private four-year institutions in Florida. Some caution is

warranted in interpreting these findings to mean that the aid subsidy alone caused the increase in price because the analyses show no change in price at institutions in Florida with the highest concentration of Bright Futures scholarship recipients. One explanation for the change in price in public sector institutions is that Florida had such low tuition rates relative to the U.S. average that Florida policymakers acted to close the price gap with surrounding states. The absence of a significant price change at private four-year institutions in Florida and institutions with high concentrations of Bright Futures recipients may suggest that these institutions responded to the increased flow of scholarship recipients by becoming more academically selective rather than by increasing their price.

The study's findings have implications for policy and research. Specifically, the findings highlight the need for states to monitor the effect of state financial aid programs on prices in each sector in order to determine what portion of the subsidy is captured by students and what portion is captured by institutions. The study also identifies directions for future research.

THE EFFECT OF STATE MERIT-BASED FINANCIAL AID ON COLLEGE PRICE:

AN ANALYSIS OF FLORIDA POSTSECONDARY INSTITUTIONS

by

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DEDICATION

For Mom and Dad~

With all my love and admiration

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CHAPTER 1

INTRODUCTION

Introduction

State governments play a critical role in financing and extending access to postsecondary education in three primary ways: by making decisions about direct appropriations to institutions, by influencing or setting tuition prices at public institutions, and by offering state financial aid programs directly to students (Hauptman, 2001). During the 1990s the most striking change in the states' involvement was the initiation and growth of merit-based student financial aid programs. Traditionally state financial aid programs directed resources to financially needy students and modeled their eligibility criteria after federal grant programs such as the Pell Grant. In contrast, these new state merit-based programs award financial aid to students for good academic performance rather than financial need. Although the qualification criteria and the scholarship amounts of merit-based aid programs in different states vary widely, most states award the aid based on the student's score on a state standardized test or college entrance examinations, grade point average (GPA) in specified courses, and, in some cases, taking particular college preparatory courses.

State merit-based aid has grown considerably in the last two decades in terms of the number of states with merit-based aid, total dollar amount awarded, and percentage growth of merit-based aid expenditures compared with need-based aid. In 1993 only Georgia had a merit-based aid program, but 14 other states had launched similar

programs by 2005, and more than a dozen other states had listed the development of a merit-based aid program on their state policy agenda (Heller & Marin, 2004). In 2004-2005 all 50 states and the District of Columbia collectively spent $1.7 billion on non-need merit-based aid programs compared with only $350 million dollars 10 years earlier (National Association of State Student Grant & Aid Programs [NASSGAP], 2005). The share of state financial aid distributed based on merit grew from 10% of all state aid in the United States in 1994-1995 to 27% in 2004-2005 (NASSGAP). In the same time period, total dollars awarded through state merit-based aid programs grew by approximately 300% in constant dollars, whereas need-based aid grew by just 70% (NASSGAP).

Growth in state merit-based aid is driven by the tremendous popularity of this type of aid among policymakers and their constituents as a tool for: (a) encouraging high school students to perform well academically and to prepare for college, (b) persuading high achieving high school students to stay in-state for college, (c) promoting college attainment, (d) expanding college access within the state to stimulate production of postsecondary degrees and thereby improve the productivity of the state's economy, and (e) reducing the cost of postsecondary education in response to voter concerns about rising college costs (Heller, 2002; Heller & Marin, 2002, 2004; Heller & Rogers, 2003).

Because the price of postsecondary opportunities is increasing, the public welcomes merit-based aid programs as an additional subsidy that reduces college prices. In particular, middle- and upper-income residents in states with merit-based aid who may not qualify for means-tested need-based aid programs strongly support merit-based aid programs (McCrary & Condrey, 1998). According to the College Board (2006), the

prices of average tuition and fees have increased almost every year between 1996 and 2006 in both constant and current dollars in private and public four-year colleges. The College Board (2006) analysis also shows that tuition and fees at public four-year colleges increased by 35% in constant dollars between 2001 and 2006, 11% at private four-year colleges, and 23% at public two-year colleges. Thus, in the context of rising college prices, the popularity of merit-based aid programs is unlikely to diminish because middle- and upper-income citizens are a large and powerful supportive constituency, and policies with such broad-based political support tend to endure (Dynarski, 2004).

Ironically, state merit-based aid programs enjoy broad political support, in part, because they address middle- and upper-class anxiety about college affordability, yet recent research on state merit-based aid suggests these programs actually contribute to increases in tuition and fees (Long, 2002, 2003). Long (2002, 2003) hypothesized that the Georgia merit-based aid program might lead to an increase in student charges because institutions could capture the new aid revenues, or the program might reduce institutional financial aid because the new merit-based aid revenues substituted for institutional aid expenditures. Her analyses showed that both public and private four-year colleges responded to the introduction of the Georgia merit-based aid program: private institutions increased tuition rates while simultaneously decreasing institutional aid, and public institutions raised room and board rates. She concluded that the merit-based aid program caused these changes because the institutions with the highest concentration of merit-based award recipients had the greatest price changes even after controlling for external factors that also affect prices. Long contended that the most troubling aspect of her study

is that low-income students are more likely than high-income students to face higher net prices, because they are less likely to qualify for merit-based awards.

Because policymakers and their constituents intend for state merit-based aid programs to offset the financial burden of postsecondary education on students and their families, understanding the extent to which this popular form of financial aid is being captured by institutions, by either increasing tuition and fees or reducing institutional aid, is critical. The price response of some postsecondary institutions may inhibit the achievement of state merit-based aid goals because institutions may make choices between tuition and fees revenues, enrollment numbers, and student quality that are inconsistent with the state's policy goals. For example, a state goal to improve college affordability is not achieved if an institution responds to a state merit-based aid program by raising tuition, an action that effectively raises the net price for nonrecipients of the aid. The Florida legislature stated that the primary goal of the Bright Futures program is to reward high achieving students (Florida Statute 240.40201) but the implicit goal is improving college affordability. The results of this study provide policymakers with information to maximize the effectiveness of state merit-based aid programs in meeting state goals.

Although Long's (2002, 2003) study examined the effect of the merit-based program on institutional prices in Georgia, her findings neither represented the experience in other states nor predicted the effects of new merit-based aid programs in other states. The generalizability of Long's findings is limited because states vary in postsecondary education structure, the demographics of prospective students demanding education, as well as economic conditions and the quality of K-12 education. Given

differences in the context of states, additional research is necessary to understand the state-specific effects of state merit-based aid programs on student and institutional responses.

In the remainder of this chapter are an overview of the research topic with an outline of the literature on the relationship between student aid and college prices, a summary of the existing research on these relatively new state merit-based aid programs, and an explanation of the purpose of this study. The theoretical and methodological approaches to the study are described along with a discussion of the importance and limitations of the study.

Overview of Related Research

An examination of the effect of state merit-based financial aid on institutional net price is informed by two distinct but related bodies of research: studies on the relationship between financial aid and institutional price response and studies on the effects of state merit-based financial aid on students and institutions. The body of research on price response provides conflicting assessments of the role of financial aid in the net price of college. Long (2002, 2003) is the only researcher who examined the effects of state merit-based aid on net price, whereas in other research the effects of federal aid on net price were considered (Acosta, 2001; Li, 1999; McPherson & Schapiro, 1991, 1993). The research on state merit-based financial aid has primarily focused on the behavioral responses of students (Cornwell & Mustard, 2005; Dee & Jackson, 1999; Henry, Rubenstein, & Bugler, 2004) and not on institutional responses. An overview of each of these two bodies of research is provided.

Research on Student Aid and Institutional Price Response

Basic microeconomic theory predicts that public subsidies may unintentionally drive up prices. This price increase occurs when an increase in demand is met by a supply that requires higher prices as the quantity increases (Long, 2002, 2003; Paulsen, 2001b). Former Secretary of Education William Bennett (1987) used this framework when he commented in *The New York Times* that expanding Pell grants would do little to help with college costs because postsecondary institutions would raise tuition to capture new revenues.

Researchers who studied this hypothesis by exploring the relationship between federal student aid and institutional price found mixed results (Acosta, 2001; Cunningham, Wellman, Clinedinst, & Merisotis, 2001; Li, 1999; McPherson & Schapiro, 1991, 1993; Rizzo & Ehrenberg, 2003; Singell & Stone, 2003). When different samples and methodologies are used, existing research offers conflicting conclusions about the connection between federal financial aid subsidies and institutional price response in different postsecondary sectors. Richard Vedder (2004), in his book, *Going Broke by Degree: Why College Costs Too Much*, argued that financial aid programs increase the demand for education, thereby leading to increases in tuition; however, he provided no evidentiary support for his argument. One policy analyst with the CATO Institute (Wolfram, 2005) used a theoretical economic analysis to argue that, if the federal government stopped funneling money to schools through student aid programs, sticker prices would decline and the private market would respond by providing loans and scholarships. Others (Singell & Stone, 2003), found that Pell Grant increases are

associated with tuition increases at some private four-year institutions. Acosta found that both federal loans and grants lead to price increases at private universities, but only grants lead to increases at public four-year colleges. Others determined that federal aid leads to tuition increases in the public four-year sector, but not in the private four-year sector (McPherson & Schapiro, 1991, 1993). In contrast, other researchers asserted that there is no causal relationship between federal student aid and tuition prices (Cunningham, et al., 2001).

Researchers noted the challenges associated with measuring the effect of aid on price. Some asserted that, although a substantial federal aid subsidy, the Pell Grant has grown so slowly over time it is difficult to measure its effect on institutional behavior (Long, 2002, 2003). Baum (2005) argued that measuring the connection between the supply of aid and the price of college is difficult because federal aid is received only by a fraction of the student body. Furthermore, Pell Grants go to low-income students who enroll disproportionately in the public two-year sector, and this sector is more likely than other sectors to simply increase the number of seats in response to an increase in demand (Baum, 2005). Baum argued that the institutional practice of inflating tuition sticker prices to provide tuition discounts to less wealthy students also adds to the difficulty of measuring the effects of real changes in prices.

Some of the uncertainty in earlier research about the relationship between aid and price comes from methodological problems. For example, some studies that used a national sample of postsecondary education prices to examine the effect of loans (Acosta, 2001) or grants (McPherson & Schapiro, 1993) ignored state differences in tuition setting policies. In some states, the state legislature or a coordinating board of state higher

education sets tuition rates for public institutions, thereby making it difficult for campus administrators to alter tuition prices in response to aid.

The ambiguity of the findings on institution price response and the methodological challenge of exploring price response to aid when national data are used suggest that further analyses are needed to measure the effect of the introduction of a new aid subsidy within a specific context. Long (2002, 2003) contended that the best way to address the challenges of measuring the effect of aid on price is to use a controlled natural experiment in which a large subsidy can be examined before and after the introduction. The launch of state merit-based aid programs provides an excellent opportunity for furthering research on institutional price response.

Research on State Merit-Based Aid

Much research on state merit-based aid programs has focused on the behavioral responses of students to this form of aid. Consequently, policymakers have little information on how the introduction of these financial aid subsidies has changed or affected the net prices of institutions. For example, a number of researchers examined how state-funded merit-based aid affected the college enrollment choices of students (Binder, Ganderton, & Hutchens, 2002; Cornwell, Mustard, & Sridhar, 2004; Dynarski, 2000, 2002, 2004), their academic performance in high school (Bugler, Henry, & Rubenstein, 1999; Henry & Rubenstein, 2002; Office of Program Policy Analysis and Government Accountability, [OPPAGA], 2003), course withdrawal, credit load, retention, and summer school enrollment (Cornwell, Lee, & Mustard, 2005; Dee & Jackson, 1999; Henry et al., 2004). Researchers have also examined differences in who

qualifies for merit aid based on background characteristics such as race and income (Farrell, 2004a, 2004b; Heller & Rasmussen, 2001, 2002; Heller & Rogers, 2003; Ness & Noland, 2004; Price, 2001). Dynarski (2005) conducted one of the first studies to explore the relationship between merit-based aid programs and baccalaureate production.

Researchers disagree on whether merit-based aid programs actually increase college enrollment, an explicit goal of the merit-based programs of most states. Studies on enrollment rate response to state merit-based aid show that increases in college enrollment are associated with merit-based aid programs in the state of Georgia (Cornwell et al., 2004; Dynarski, 2000, 2002, 2004) but not in the state of New Mexico (Binder et al., 2002). Research also shows that, in both Georgia and New Mexico, merit-based aid programs are associated with shifts in enrollment from two-year to four-year institutions (Binder et al., 2002; Dynarski, 2002, 2004). Researchers disagree on the effects of state merit-based aid on enrollment increases for White students compared with Black students (Cornwell et al., 2004; Dynarski, 2002, 2004). Dynarski found that in Georgia merit-based aid had greater effects on the college enrollment rates of middle- and upper-income students and White students rather than low-income students and Black students, because Black students are more likely to stay in-state to study.

Researchers report that groups most likely to be underrepresented in higher education are the least likely to be awarded state merit-based aid scholarships, and this relationship increases when the eligibility criteria are more rigorous (Farrell, 2004a; Heller & Rogers, 2003). For example, research shows clear differences in who qualifies for and receives merit-based aid, revealing that low-income and minority students are the

least likely to qualify (Farrell, 2004a; Heller & Rasmussen, 2001, 2002; Heller & Rogers, 2003; OPPAGA, 2003).

The findings are inconclusive as to whether state merit-based aid programs provide an incentive for students to perform better academically in high school. Some researchers (Heller & Rogers, 2003) found small improvements in academic performance for all students but almost no changes in academic performance for Black students following the introduction of state merit-based aid programs in Michigan. Other researchers (OPPAGA, 2003) found that after the introduction of merit-based aid in Florida, academic preparation among students increased for all indicators except test scores, suggesting that grade inflation may explain some of the increases in academic performance measured by GPA. Still other researchers (Bugler et al., 1999; Henry & Rubenstein, 2002) found that grade inflation did not explain the increase in student GPAs in Georgia following the introduction of the HOPE (Helping Outstanding Pupils Educationally) merit-based scholarship program because increases in enrollment in college preparatory curricula and grades are positively correlated with increases in the scores of college entrance exams.

With one exception, research generally indicates that academic behaviors in college are negatively affected by state merit-based aid because college students who receive state merit-based aid take lighter course loads, withdraw from courses more frequently, and pay higher yearly costs as they enroll in more summer school courses (Cornwell & Mustard, 2005; Dee & Jackson, 1999; Henry et al., 2004). Dee and Jackson found that merit-based aid recipients who enrolled in difficult academic disciplines, such as science and engineering, were more likely than other merit-based aid recipients to lose

their aid awards, potentially discouraging students from difficult academic majors. Within a small sample of Georgia institutions, those who received merit-based aid and lost the scholarship appeared to be less likely to ever complete a degree than those who never received merit-based aid (Henry et al., 2004). In contrast, Dynarski (2005) found merit-based aid to have a positive effect on enrollment, concluding that the number of baccalaureate degrees increased with the introduction of Georgia HOPE.

A few studies have explored how enrollment responses to the introduction of state merit-based aid led to demographic changes and selectivity changes in institutions. These studies show that, in Georgia, the composition of institutions changed after the introduction of HOPE to greater homogeneity of student ability at more selective institutions, greater racial disparity across institutions, and a general increase in student quality at both public and private four-year institutions (Cornwell et al., 2005; Cornwell & Mustard, 2001, 2006).

Summary

Although existing research examines several important student-level effects of state merit-based aid programs, little is known about the effects of state merit-based aid on institutional outcomes. Moreover, little is known about the effects of state merit-based aid in states other than Georgia. Although researchers note the methodological challenges associated with examining the effects of federal student aid on institutional price response, few have examined the effects of state merit-based aid on institutional prices. Long's (2002, 2003) study shows that Georgia's four-year private institutions decreased institutional aid and four-year public institutions increased room and board charges in

response to the introduction of state merit-based aid. Additional research is necessary to understand the effect of state merit-based aid programs on institutional prices in other states.

Theoretical Framework

Economic theory provides a framework for analyzing three sets of behaviors relevant to this study: the provision of subsidies by state governments, enrollment decisions by students, and price-setting by postsecondary institutions. Economic theory within the public finance framework explains the economic motivations for governments to subsidize higher education. Human capital theory explains student enrollment decisions, including the relationship between state merit-based aid and student demand for education. The microeconomics of not-for-profit organizations, as opposed to the behavior of for-profit firms, explains how different categories of educational institutions vary in the ways they maximize their interests in selecting students and setting tuition and fee rates.

Public sector economists (Cohn & Geske, 2004; Paulsen, 2001b) indicate that government subsidies to postsecondary education are introduced as corrective measures for deficiencies in markets that lead to inefficient or inequitable outcomes. These deficiencies include externalities that cause private underinvestment, inequalities in opportunities that result from imperfections in capital markets, and differences in opportunities associated with inequalities in academic preparation and information about college (Cohn & Geske, 2004). When free markets do not produce efficient resource allocations to education, or when the benefits of a system are distributed inequitably,

government subsidies are a lever for improving the efficiency of those markets (Paulsen, 2001b).

Human capital theory connects government financial aid to student application and enrollment behaviors by modeling an education investment decision as analogous to a firm's decision to invest in physical capital (Becker, 1976). According to human capital theory, a person makes rational choices by calculating the direct costs and the opportunity costs of forgone earnings against the benefits of increased net earnings and other nonmonetary benefits over the life cycle and decides whether the net value of education is greater than that of other options (Becker, 1976). For students eligible for state merit-based financial aid, the aid lowers the overall financial cost of postsecondary education. This reduction in costs increases the likelihood that the net benefits will exceed the net costs, thereby increasing the individual demand for higher education. When aggregated with all students in the state, state merit-based aid drives up the demand for postsecondary education at every price level.

Economists (Clotfelter, 1996; Winston, 1999) have suggested that postsecondary institutions vary in their response to changes in student demand stimulated by government subsidies because of both their profit orientation and other institutional objectives. Although most postsecondary education institutions function as not-for-profit entities, institutions attempt to maximize their long-term financial resources to achieve their educational goals. Institutions maximize revenues over costs by optimizing the sum of expected tuition and fees, external giving, and endowment earnings while also furthering the mission of the institution and its stakeholders' interests (Winston, 1999). Institutions may or may not change their prices depending on their capacity to add

enrollment slots, the behavior of their competitors, and their preferences for quality and prestige maximization (Clotfelter, 1996; Winston, 1999). In some cases, institutions may have the opportunity to adjust prices and therefore capture part of the government subsidy.

This economic theoretical approach to examining the behavior of states, students, and institutions provides the framework for understanding the pricing behavior of postsecondary institutions as suppliers of education. This theoretical understanding of postsecondary institutional price response to state merit-based aid programs combines explanations for the behaviors of governments, prospective students, and postsecondary institutions in a single economic supply and demand model for state postsecondary education. This theoretical framework avoids the weakness of focusing on only one of the three actors and ignoring their joint determination of postsecondary education pricing. This theoretical framework provides the context for formulating this study's economic model of the price-setting behavior of postsecondary institutions in Florida.

Purpose

This study extends two bodies of research, one that analyzes institutional price response to student financial aid and a second that examines the effect of state merit-based aid programs on institutions. Applying an economic theoretical framework to postsecondary education pricing, this study explores how institutions respond to the introduction of a new aid subsidy and how price response varies for different types of postsecondary institutions. Using descriptive and ordinary least squares regression analyses that include year fixed-effects and other controls, this study uses institutional

data for the 1993-1994 to 2000-2001 academic years from the Integrated Postsecondary Education Data System (IPEDS) and the Florida Bright Futures program to explore the following research questions for each of four sectors of postsecondary education (public four-year, public two-year, private four-year, and for-profit institutions):

1. How do the levels of tuition and fee charges, room and board charges, and grant aid expenditures at Florida colleges and universities compare with the levels at institutions in other states?
2. How do annual changes in tuition and fee charges, room and board charges, and grant aid expenditures at Florida colleges and universities compare with annual changes at institutions in other states after the introduction of the Bright Futures merit-based aid program?
3. Relative to a comparison group of institutions in other states, how do tuition and fee charges, room and board charges, and grant aid expenditures at Florida colleges and universities react to the introduction of the state merit-based aid program after controlling for institutional and state economic characteristics?

Research Method

A brief description of the Bright Futures merit-based aid program is followed by an explanation for the selection of Florida for this study. A summary of data sources, statistical methods, and selected variables follows.

Florida Bright Futures Scholarship

The Florida Bright Futures scholarship program was launched by the Florida Legislature in 1997. It consists of three types of awards: the Florida Academic Scholarship (FAS), the Florida Medallion Scholarship (FMS), and the Florida Vocational Gold Seal Scholarship (GSV). Each award has different requirements for courses, GPA, and test scores. Generally, the criteria require that students achieve a GPA higher than 3.5 and Scholastic Aptitude Test (SAT) scores higher than 1270 for the FAS. For the FMS, the GPA must be higher than 3.0 and SAT scores must be higher than 970. For the GSV there is a 3.0 overall GPA requirement and a 3.5 GPA requirement in vocational courses. Approximately one-third of high school graduates qualified for one of the three Bright Futures awards in 1997 when the program was first introduced (OPPAGA, 2003). Since 1997, most of the growth in student recipients has taken place in the Florida Medallion Scholarship, which falls in the middle in terms of the level of academic requirements necessary for qualification.

The Bright Futures program is the largest state-funded financial aid program in Florida, making up more than three-quarters of all state aid disbursed to Florida residents (Office of Student Financial Assistance [OSFA], 2005). Disbursements during the first year, 1997, totaled $69.6 million and rose to $174.9 million by its fifth year (OSFA, 2005). In 2004 expenditures rose to $269.0 million with more than 150,000 Florida postsecondary students receiving the awards, 50,000 of whom were first-time recipients (OSFA, 2005). In the final year of the study period the average Bright Futures scholarship per recipient in 2006 dollars was $2,000 for public four-year institutions,

$2,143 for private four-year institutions, $1,733 for for-profit institutions and $900 for public two-year institutions. These awards covered either 75% or 100% of tuition and fees at public institutions or an average of comparable public institutions for private four-year and for-profit institutions. The average scholarship amount awarded per student in the public four-year sector is approximately $2,000 per academic year, $2,200 in the private four-year sector, $900 in the public two-year sector, and $1,700 in the for-profit sector. Students who qualify for the more academically rigorous scholarship receive approximately 30% more funding in each sector.

The Bright Futures program is an appropriate focus for this study because of the size of the merit-based aid awards in relation to tuition sticker prices, the broad eligibility criteria of the scholarship, the ability to use a quasi-natural experiment method, and the lack of current research on institutional price response to the program's introduction. First, Florida is one of just a few states with merit-based aid programs where the scholarship amount covers 75% or more of the full cost of tuition and fees at one of the state's public institutions. Other states with this coverage are Georgia, Florida, Louisiana, New Mexico, and West Virginia. A merit-based aid program that covers a large share of the cost of tuition is more likely than a program with smaller awards to influence the thinking and planning of students for college because a human capital model predicts that the student's cost-benefit analysis is sensitive to net price (Paulsen, 2001a). Second, the Bright Futures program offers three different scholarships (with three different ranges of academic requirements), and approximately 40% of Florida high school graduates meet the eligibility requirements for at least one of the three programs (Florida Department of Education, 2005). This high rate of qualification has the potential to make a broad effect

on the demand for the state's postsecondary institutions if the number of students enrolling in college increases as a result. Third, because Florida introduced its program in 1997, a quasi-natural experimental method may be used to examine the effect of the program relative to the surrounding control group of states, most of which had not introduced a merit-based program at that time. This method makes it possible to isolate the effect of the program's introduction, strengthening the causal link between the subsidy and changes in institutional prices. Finally, existing research on state merit-based aid in Florida has examined the effect of the program on student achievement in high school and college enrollment (OPPAGA, 2003) but has not yet examined the effect of the program on the prices of postsecondary institutions. A more complete understanding of the effect of the program on institutional prices and expenditures is needed to inform the efforts of policymakers to assess the effectiveness of this program in meeting the state's goals of rewarding student achievement and improving affordability.

Data and Statistical Method

The primary data source for this study is eight years of enrollment and finance data (1993-1994 to 2000-2001) from IPEDS. The U.S. Department of Education's National Center for Education Statistics (NCES) collects institution-level data for IPEDS from all postsecondary institutions in all 50 states, the District of Columbia, and parts of Puerto Rico. IPEDS defines a postsecondary institution as any organization open to the public that has as its primary mission the provision of postsecondary education, which is defined as "formal instructional programs with a curriculum designed primarily for

students who are beyond the compulsory age for high school...[including] academic, vocational, and continuing professional education programs" (NCES, 2004, p. 1).

The IPEDS database includes information about more than 6,000 institutions that participate in Title IV federal student financial aid programs, such as Pell Grants or Stafford Loans. The dataset contains several variables relevant to this study, such as college enrollment counts, student financial aid expenditures, tuition rates, and fee charges. Because institutions are required by law to participate in the survey in order for their students to receive Title IV federal financial aid (P. L. 102-325), IPEDS has high response rates. Although not without limitations, the dataset is the most reliable dataset available for studying institutions across multiple states.

IPEDS data are supplemented by data from the Florida Bright Futures program. The Office of Student Financial Assistance within the Florida Department of Education gathers data on all scholarships dispersed to Florida residents through the Bright Futures program. This study uses information about the number of Bright Futures recipients at each institution (initial and renewal) and the dollar amount received for each recipient at each institution (initial and renewal) for selected years after the program's introduction (1997-98 to 2000-01).

To address the first and second research questions, descriptive analyses are used to measure in constant dollars how average prices and expenditures changed in the sample period. To address the third research question, this study uses a differences-within-differences method, and the coefficients are estimated by using ordinary least squares regression analysis that includes year fixed-effects and controls for state and economic characteristics. The differences-within-differences approach was used in earlier

studies that examined student response to merit-based aid in Georgia and New Mexico (Binder et al., 2002; Cornwell & Mustard, 2001; Dynarski, 2000). According to Meyer (1995), differences-within-differences is a useful method for analyzing a well designed natural experiment in which "there is a transparent exogenous source of variation in the explanatory variables that determine the treatment assignment…[such as those] induced by policy changes, government randomization, or other events [that] may allow a researcher to obtain exogenous variation in the main explanatory variables" (p. 151). The introduction of merit-based aid in Florida provides this kind of policy change treatment. Similar to Long (2002, 2003), this study uses surrounding states from the southeastern region that have not introduced a merit-based aid program during the eight years of the study period as a comparative control group to account for changes in postsecondary education that affect all institutions. The analysis further compares Florida to a control group including all of the United States that did not introduce a merit-based aid program before or during the study period. Tuition and fees are analyzed at institutions in four sectors: public four-year, private four-year, public two-year and for-profit. Room and board charges are measured in four-year sectors only, which more commonly offer room and board. Grant aid expenditures are only measured at four-year private institutions, the sector that most commonly offers institutional grants. Grant aid expenditures in public four-year institutions are not analyzed as a result of small sample sizes.

As in other price response analyses (Li, 1999; Long, 2002, 2003; McPherson & Schapiro, 1991, 1993; Singell & Stone, 2003), the outcome variables for this study are three separate measures of price: tuition and fees, room and board, and institutional grant aid expenditures per full-time equivalent (FTE) student. The primary independent

variable for this study is the introduction of the Florida Bright Futures program. Measures of several institutional characteristics are included in the analyses: institutional selectivity, endowment size per FTE, Carnegie classification, and appropriations per FTE. To test whether the effect on prices is greatest at institutions with the most recipients, a measure of scholarship recipient concentration at each institution is calculated. Previous research (Acosta, 2001; Long, 2002, 2003; McPherson & Schapiro, 1993; Rizzo & Ehrenberg, 2003) found that several aspects of state characteristics predict differences in institutional prices. Based on this precedent, this study uses data from the U.S. Census Bureau's Current Population Survey to control for state-level determinants of price, including unemployment rate, per capita income, educational attainment, and postsecondary enrollment capacity.

Limitations and Significance

This study has several limitations. First, some southeastern states (e.g., Georgia, Kentucky, Louisiana, Mississippi, and South Carolina) introduced merit-based programs before and during the study period and therefore cannot be included in the control group. Therefore the control group includes only seven southeastern states (Alabama, Delaware, Maryland, North Carolina, Tennessee, Virginia, and West Virginia), and the results are not as robust as they would have been with a larger control group sample (Meyer, 1995). Second, although providing the best available information on college prices over time, IPEDS suffers from quality control issues. Data quality issues are particularly problematic for the years before 2000 because of inconsistencies in how institutions interpreted the definitions of several elements of the surveys (Jackson, Jang, Sukasih, &

Peeckson, 2005). Third, institutions that do not have at least four of the eight years of IPEDS data are eliminated from the analyses, which may reduce the external validity of the results. Finally, the results of this study may not be generalizable to institutions in states other than Florida because of differences in state characteristics, including characteristics of state merit-based aid programs.

Despite these limitations, this study extends and improves the empirical testing of institutional price response to state government subsidies by using a quasi-natural experimental method to study the introduction of a program within a single state context. Similarly, this study extends the assessment of the effect of state merit-based aid programs to institutions by focusing on Florida, a previously unstudied state. The generalizability of previous findings from research that focus on the state of Georgia is limited given differences in state context. For example, compared with Georgia, Florida is home to proportionally larger two-year and for-profit sectors and a proportionally smaller four-year public sector as well as a state merit-based aid program with broader eligibility criteria.

The results of this study offer important findings for policymakers about the effects of state merit-based aid on institutional prices. The adverse effects of institutional price response on state merit-based aid policy goals for accessibility, affordability, and degree production concern state policymakers, because these effects counter the stated purposes of these state programs (Heller, 2002; Heller & Marin, 2002, 2004; Heller & Rogers, 2003). This study provides information of special value to policymakers in Florida because the study assesses the effects of the Bright Futures program on prices which are relevant to the program's achievement and affordability goals.

LITERATURE REVIEW

CHAPTER 2

Introduction

This literature review describes research related to state merit-based aid programs and institutional price response to other types of student financial aid. Three purposes of this literature review are to describe the application of economic theory to the study of postsecondary price determination, critically examine the empirical research on institutional price response to student financial aid, and analyze existing research on state merit-based aid programs and summarize what is known about the effect of these programs on students and institutions.

Theoretical Framework

Three sets of actors interact in the market for higher education within the economic framework of this study: students as consumers who demand education, postsecondary institutions that supply education, and governments that provide subsidies, such as state financial aid, that stimulate changes in student demand and institutional supply for education. The introduction of an aid program in a given state increases some students' ability to pay for college at every price level, thereby placing upward pressure on student demand for postsecondary education. The outward shift in demand occurs as the number of people able and willing to buy postsecondary education at each price increases, and this puts outward pressure on both the quantity and price of education in the states. The actual quantity and price levels in the state are also determined by the

response of institutions to these increases in demand as reflected in the shape of the supply function.

Economic theory explains three sets of behaviors that inform research on the relationship between state merit-based aid and institutional price response: public subsidy and the behavior of governments, human capital theory and student enrollment decisions, and microeconomics and the pricing behavior of postsecondary institutions. The public finance framework explains the economic motivations for governments to subsidize particular goods and services, including higher education. Human capital theory explains student enrollment decisions, including the relationship between state merit-based aid and student demand for education. The microeconomics of not-for-profit organizations, as opposed to the behavior of for-profit firms, explains how different categories of educational institutions vary in the ways they maximize their interests in selecting students and setting tuition and fee rates. Each of these three applications of economic theory informs the economic model for this study.

Because some postsecondary institutions may adjust the number of admitted students and the prices charged as a result of changes in student demand for education, institutional response must be factored into assessments of the effect of government subsidies on enrollment and pricing outcomes. One intended goal of state subsidies to higher education is to stimulate demand, particularly for those who have low income and are most likely to underinvest because of financial constraints. Greater equity in enrollment rates among students from different income backgrounds is the explicit goal of many federal and state financial aid programs (McPherson & Shapiro, 1998). However, institutional responses to financial aid can mute the intended effects of that aid

by raising prices or by changing the net prices for different populations of students. In the next three sections the application of economic theory to the behaviors of governments, students, and institutions in the postsecondary education market is described.

Economic Analysis of Public Subsidy

Theorists (Cohn & Geske, 2004; Paulsen, 2001b) have argued for government subsidies to postsecondary education as corrective measures for deficiencies in markets that lead to inefficient or inequitable outcomes. When markets do not produce efficient resource allocations to education, or when the benefits of a system are distributed inequitably, government subsidies are a lever for improving the efficiency of those markets (Paulsen, 2001b). Four deficiencies that government subsidies are designed to address are the following: externalities that cause private underinvestment, the quasi-public good characteristics of higher education, inequalities in opportunities that result from imperfections in capital markets, and differences in opportunities associated with inequalities in academic preparation and information about college (Cohn & Geske; Paulsen).

First, economists (Cohn & Geske, 2004) have proposed that externalities related to the consumption of postsecondary education justify government subsidies. Because the benefits to society associated with education are greater than the earning premiums that are realized by individuals, one reason governments subsidize postsecondary education is to increase levels of participation (Cohn & Geske, 2004). Absent such subsidies, individuals underinvest in education compared with the socially optimal level. In other words, individuals do not consider the positive benefits that society realizes through

educational attainment when making their own education investment decisions. Society derives substantial, well-documented benefits from education that extend beyond the personal benefits to individual students. The benefits include higher tax revenue, better public health, increased civic activity, and economic development (Bowen, 1977, 1996). Higher levels of education are associated with lower unemployment, decreased crime activity, and less demand for government social programs (The College Board, 2004). Educational attainment is also associated with healthier living habits, higher voting participation, and more civic activities such as volunteering and donating blood (The College Board), all of which benefit society in reduced costs for social services and greater contributions from citizens. The RAND Corporation (1999) estimated that the federal government annually saves between $800 and $2,700 on social programs for each individual college graduate compared with each high school graduate. Research shows that, at both a national and a state level, higher education attainment is associated with increased productivity (Carnevale & Desrochers, 2003) and greater tax revenues (The College Board, 2005). In their meta-analysis about the role of financial aid, college prices and student enrollment response, Leslie and Brinkman (1988) estimated that investments in postsecondary education account for approximately one-fifth of all economic growth nationally. Postsecondary education contributes to the development of human capital and helps make the United States competitive as a nation in the global marketplace, a marketplace that increasingly requires greater skill and knowledge (Carnevale & Desrochers). Therefore, government subsidies to education are justified because, in their absence, individual prospective students underestimate the benefits of education and acquire less than the socially optimal level.

Second, government subsidies for higher education are also justified because of the quasi-public good nature of postsecondary education. Paulsen (2001b) described a pure public good as one in which no one is excluded from its benefits, and one person's consumption does not preclude another from consuming it. Examples of public goods include national defense and mosquito control. Cohn and Geske (2004) contended that citizens in a given state benefit from overall increased productivity when the government invests in higher education. Because all citizens benefit from this activity and no one can be excluded from sharing in the benefit, governments are justified in mandating that all citizens share the cost of producing the benefit by raising taxes to fund postsecondary education. In this way, the government subsidy "promote[s] a more socially efficient allocation of resources to higher education in a state" (Paulsen, 2001b, p. 102).

Third, economists justify government subsidies for higher education because imperfections in the capital markets fail to provide adequate financing for students who want to invest in their education (Behrman, Crawford, & Stacey, 1997; Cohn & Geske, 2004; Paulsen, 2001b). For example, absent government intervention, individuals may have difficulty obtaining financing for educational investment, because they are unable to borrow against the collateral of their future, not-yet-earned degree. Without government guarantees, lenders might be unwilling to make loans because the risk of not being repaid is too high (Cohn & Geske, 2004). These market failures lead to special challenges for students from low-income backgrounds because, unlike their high-income peers, they cannot use family wealth as collateral for loans in private markets (Kane, 1999b). In response to these market imperfections, governments may seek to improve student access

to affordable postsecondary education through funding need-based aid programs, guaranteed student loans, and direct subsidies to colleges and university.

Finally, governments justify their investment in higher education as a response to other market imperfections that limit opportunities for individuals from low-income families to enter postsecondary education and consequently further perpetuate inequities in society (Kane, 1999a; Leslie & Brinkman, 1988). Even with adequate financing, potential students from low-income families face barriers in their decisions to invest in higher education that make government intervention necessary. Compared with their higher-income peers, low-income students have less academic preparation and poorer information about postsecondary education and its costs (Kane, 1999a). Furthermore, assuming that greater equality is a societal goal, investment in education is a more efficient method than direct transfer payments by government entities to increase the income of individuals at the low end of the income distribution (Becker, 1976; Cohn & Geske, 2004; Paulsen, 2001b). In other words, inequities in the capacity to invest in higher education are better remediated through education itself than through income transfers.

In summary, public finance theory explains how deficiencies in markets that lead to inefficient or inequitable outcomes, for the public or for individuals, motivate governments to intervene in postsecondary education. Even in the absence of inequities associated with income, governments are justified in subsidizing postsecondary education to correct social inefficiencies caused by externalities that result in private underinvestment and by the quasi-public good characteristics of postsecondary education. Governments are also motivated to intervene in postsecondary education to address

income-related imperfections in capital markets and inequalities in opportunities associated with differences in academic preparation and access to information.

Governments may intervene in markets by increasing the supply of postsecondary education or increasing the demand for postsecondary education or both. One common response is for state governments to make direct appropriations to public sector postsecondary institutions (and in some cases the private sector) to increase the supply of education in the state. States also increase demand for postsecondary education by providing financial aid directly to students. In contrast to need-based financial aid, merit-based aid may be inconsistent with traditional rationales for government interventions in the market. If state merit-based aid creates incentives that improve student academic preparation for college and thus encourage more students to enter college, the merit-based subsidy may be effective in addressing underinvestment in postsecondary education. But, if state merit-based aid is disproportionately awarded to students from groups that are not historically underrepresented in higher education, this form of aid is a disadvantage to those the state would otherwise want to subsidize to equalize opportunities and outcomes. In other words, from a public finance perspective, state merit-based aid implies a trade-off between efficiencies for the public as a whole against equitable outcomes across individuals. In the next section the theoretical mechanisms by which government subsidies to students translate into changes in student behaviors and, therefore, changes in student demand are explained.

Economic Analysis of College Enrollment Decisions

Financial aid to students is one type of government subsidy that affects the demand for postsecondary education by changing the pricing of the individuals' decision about education investment. Human capital theory models an education investment decision as analogous to a firm's decision to invest in physical capital (Becker, 1976). The short-term costs of acquiring education are an allocation of resources away from consumer goods and toward the production of producer goods that will generate future benefits (Douglass, 1977). The producer good, human capital, consists of "the acquired energy, motivations, skills, and knowledge possessed by human beings, which can be harnessed over a period of time to the task of producing goods and services" (Douglass, 1977, p. 362). The person makes rational choices based on an analysis of the perceived costs and benefits of investing in education confined by the individual's preferences and tastes (Becker, 1964, 1976). The person calculates the direct costs and the opportunity costs of forgone earnings, compares the costs against the benefits of increased net earnings and other nonmonetary benefits over the lifecycle, and decides whether the net value of education is greater than that of other options. The person makes a choice that maximizes his or her welfare and increases investment in education until the declining marginal return on the last dollar of investment equals the rising marginal costs of financing that dollar (Becker, 1976). Public subsidies in the form of financial aid to students reduce the marginal costs for postsecondary education and increase the level of education at which marginal return and marginal costs are equal.

When applied to college enrollment, the human capital decision-making model assumes that a prospective student calculates the net costs and benefits of postsecondary

education compared with alternative choices such as immediate employment, military service, or other options. Paulsen (2001a) identified these expected costs as direct costs, indirect costs, and the forgone earnings for an individual who does not work while enrolled and the expected benefit as anticipated earnings over the number of years he or she will work. In addition to greater expected income, the student may consider other benefits including greater quality of life, as well as cultural and nonmonetary gains (Becker, 1992). Financial aid enters into this equation as a reduction in the total direct costs of tuition, fees, and books, as well as the costs of living and the forgone earnings while enrolled in postsecondary education (St. John, 2004).

State merit-based aid programs are one type of aid that reduce costs for students and, therefore, have implications for the individuals' investment calculations. For students eligible for state merit-based aid, the scholarship lowers the total financial cost of postsecondary education. This reduction in costs increases the likelihood that the net benefits will exceed the net costs, thereby increasing the individual demand for higher education. When aggregated across all students in the state, state merit-based aid drives up the demand for postsecondary education at every price level. The scale of the shift in demand depends on the response of those students at the margins who previously were not demanding education at a given price level as well as the magnitude of the price change.

Because of the size of the state merit-based aid scholarships in relation to price and because of the wide availability of these subsidies in certain states, these programs are likely to create observable changes in student demand for postsecondary education. Students who previously would have considered the benefits of postsecondary education

not worth the costs may reverse their assessment because of available aid. Several state merit-based aid programs offer a scholarship large enough to cover the full tuition and fee costs of attending a four-year or two-year public institution in their state along with stipends for books (Georgia, Florida, Louisiana, New Mexico, and West Virginia). Human capital theory suggests that these subsidies can have a dramatic effect on the demand for higher education within those states, particularly for those students for whom costs are a primary barrier to college attendance and who can meet the merit-based aid eligibility requirements. These programs also are likely to create observable shifts in relative student demand for different sectors of postsecondary education based on the portability of the subsidy, because students at the margin shift from out-of-state to in-state, from two-year to four-year sectors, and from private to public sectors (or vice versa depending on state context).

Although merit-based aid programs may reduce some or all direct costs for students and stimulate demand, economists (Becker, 1976; Paulsen, 2001a) have argued that variations in student demand for higher education in response to these cost reductions are partially a result of differences in family, cultural, and educational backgrounds of students that influence their real or perceived estimates of costs and benefits of postsecondary education. Becker suggested that the rate of return to education in the labor market varies by race and gender, and consequently postsecondary education demand varies across these groups. Student investment decisions may also vary because of differences in the quality of the K-12 schools that they attend. Paulsen indicated that the quality of K-12 schools is associated with academic achievement, educational attainment, and earnings. Although merit-based aid reduces costs for all eligible students,

variations in student characteristics, such as race, gender, income, and high school academic experiences, affects the way these changes enter the calculation of costs and benefits.

In summary, human capital theory explains how state merit-based aid as a form of public subsidy to students increases the demand for postsecondary education. Students at the margin seek enrollment because of the increase in benefits relative to the costs for postsecondary education compared with alternative choices. Variations in student characteristics affect calculation of costs and benefits, leading to different levels of demand for human capital for different subpopulations. In the next section, how different types of institutions vary in their enrollment and pricing behaviors in response to changes in student demand is explained.

Economic Analysis of Institutional Price Setting

The response of postsecondary institutions to changes in student demand stimulated by government subsidies is contingent on institutional profit orientation and other objectives. Most postsecondary education institutions function as not-for-profit entities. Therefore, these institutions do not maximize revenues over costs for the purpose of distributing profits to owners or stockholders but rather attempt to maximize their long-term financial resources to achieve their educational goals. Not-for-profit institutions optimize the sum of expected tuition and fees, external giving, and endowment earnings while also furthering the mission of the institution and the stakeholders' interests (Winston, 1999). Unlike public and private not-for-profit institutions, the profit-maximizing strategies of for-profit institutions do not include the

use of external donative giving or direct appropriations to subsidize and sell their product at a price below the cost of its production. Both nonprofit and proprietary postsecondary institutions make enrollment and pricing decisions that best match their financial and mission interests.

For some institutions, the ability to change prices in response to changes in student demand is limited by state legislatures or state governing boards for higher education and by competition from other institutions (Winston, 1999). If the structure of postsecondary education supply includes a combination of existing institutions and potential new institutions that are able and willing to increase total enrollment seats unconstrained at a given price level, the supply function is perfectly flat and the increase in demand caused by increased financial aid is directed into increased enrollments at a constant price. Supply is constrained when additional seats are more costly than existing seats, barriers exist that prevent the development of new institutions, the number of competitors in a market segment is small, and institutions have a preference for quality and prestige maximization. When supply is constrained, some institutions have the opportunity to adjust prices and therefore capture part of the government subsidy (Clotfelter, 1996; Winston, 1999). The actual price response of institutions to financial aid is a matter of empirical research, and researchers (Acosta, 2001; Cunningham et al., 2001; Li, 1999; McPherson & Schapiro, 1991, 1993; Rizzo & Ehrenberg, 2003; Singell & Stone, 2003) found varying price responses based on aid structure, institutional categories, and other state context factors. This empirical work is summarized in later sections of this chapter.

For those institutions that are able to adjust price in response to changes in demand, the actual price response is further constrained by institutional goals and objectives. Theorists argue that not-for-profit institutions seek to maximize their discretionary budget, defined as the surplus of total revenues above the total cost of producing the institution's educational services (Blais & Dion, 1991; McPherson & Schapiro, 1993). These total revenues come from "commercial" income which encompasses fees collected for education services, and "donative" income from government appropriations, endowment income, and other charitable giving by individuals and organizations (Hansmann, 1986). Because of these two revenue streams, nonprofit postsecondary institutions, unlike for-profit businesses, are able to sell their product at prices below the cost of production. This perpetual ability to subsidize all of its customers violates the long-term relationship between price, supply, and revenues that govern for-profit businesses, including for-profit postsecondary institutions, which require commercial income to exceed costs of production over the long term (Winston, 1999). Within the pursuit of institutional objectives, not-for-profit postsecondary institutions can set prices for reasons other than commercial profit maximization.

Therefore, the relationship between price and the supply of postsecondary education by a state's institutions is not fully analogous to the relationship between price and supply in commercial markets because of the not-for-profit nature of a sizable majority of postsecondary institutions (Winston, 1999). Both the commercial profit-maximizing firm and the not-for-profit institution share the constraint that total costs must be below total revenues for the long-term life of the organization. But, although the for-profit entity must maintain a level of fees charged for goods and services that exceeds

the total costs of producing those goods and services, the not-for-profit entity may use donated revenues from other sources to supplement the fees it collects for goods and services to cover total production costs. Nonprofit postsecondary institutions can and do subsidize their customers, charging them tuition and fee rates that are less than the actual cost of providing education (Winston, 1999).

Another dynamic that affects the pricing behavior of postsecondary education is the dual role that students play as both customers and suppliers (Rothschild & White, 1995). Education employs a customer-input technology in which fellow students are an important input into the quality of the educational attainment of their peers. In other words, "Peer quality is, technically, an input to a college's production, one that cannot be bought from anyone other than its own customers" (Winston, 1999, p. 18). This feature implies that two transactions are combined in the net price students pay: "The student-as-customer pays a price for education while the same student-as-supplier-of-input is paid a wage rate by the school…leaving a net tuition payment as their difference" (Winston, 1999, p. 18). In addition to paying for the human capital that they acquire through their educational experiences as tuition and fees, some students are selected according to an institution's objectives to receive compensation for their inputs into the education production function in the form of discounted tuition and fees, scholarships, and nonmonetary consideration, such as admittance to honors programs. Therefore, interpretation of an institution's pricing response to government aid must consider changes in the sticker price, net price, and quality of admitted students.

Three rationales explain why institutional charges are not fully determined by profit maximization. First, not-for-profit postsecondary institutions have donative

resources that are available to subsidize students. Second, institutions are able to realize benefits from students through their contributions as inputs to the education production function for their peers and as inputs into the prestige and reputation creating activities of colleges and universities. Third, students vary in their contribution to fulfilling other institutional preferences or mission objectives. Therefore, prices charged by institutions are driven by the relative value of the student to the institution as an input into the education production and as an input into the achievement of institutional mission objectives, over and above the tuition and fees charged to the student.

Summary

The theoretical framework for understanding postsecondary institutional price response to state merit-based aid programs combines explanations for the behaviors of governments, prospective students, and postsecondary institutions in a single economic supply and demand model for state postsecondary education. Governments attempt to correct market inefficiencies and inequities by providing subsidies to students or postsecondary institutions or both. When those subsidies are provided to students as financial aid, their effects on student demand are influenced by other student demographic characteristics, including gender, race, income level and the quality of high school academic experiences. Actual student enrollment outcomes are further determined by changes in prices made by postsecondary institutions in response to increases in student demand generated by subsidies. Variations in not-for-profit status, mission, objectives, financial resources, and student quality lead to variations in the price responses that postsecondary institutions make to changes in student demand.

In the following section, empirical studies on the relationship between postsecondary prices and financial aid are reviewed. The review traces the growth of this literature from a focus primarily on Pell Grants to other forms of financial aid subsidy. A summary of the conflicting findings about the effect of financial aid on institutional price and a catalogue of some of the limitations that restrict the ability of most studies to accurately measure price response conclude the section.

Relationship between Financial Aid and Institutional Price

Research on institutional price response to student financial aid is relevant to concerns expressed by policymakers and citizens about the rising price of colleges. Since the early 1990s, following the introduction of the notion that financial aid subsidies lead to price increases (Bennett, 1987), researchers have given attention to this topic. In this section the institutional price response to three different types of subsidies, federal Pell Grants, federal loans, and state merit-based aid, are described. How researchers have analyzed institutional price response to several different types of student financial aid is summarized, the strengths and weaknesses of existing studies are analyzed, and aspects of previous work that this dissertation builds upon are identified.

Initial Findings for Federal Pell Grants

Research on the institutional price response to federal grant aid revenues shows that change in price varies considerably across institutional sectors (Li, 1999; McPherson & Schapiro, 1991, 1993). Some of this difference may be explained by different sample periods, controls, and methods used in the studies. In the private four-year sector, Li

concluded that Pell Grant aid is associated with increases in prices, whereas others (McPherson & Schapiro, 1991, 1993) found no effect. For the public four-year sector, some have concluded that Pell Grant aid is associated with increases in prices (Li, 1999; McPherson & Schapiro, 1991, 1993).

Early empirical studies by McPherson and Shapiro (1991, 1993) found that the relationship between student financial aid and institutional price response varies by institutional type. Their study looked broadly at subsidies to higher education to measure the response of colleges to changes in government subsidies associated with changes in the per student levels of scholarship aid, gross tuition and fees, and instructional expenditures. Using a national sample of price data from the Higher Education General Information Survey of 1978-1979 and 1985-1986, they examined changes in prices relative to financial aid in a sample of 1,934 private four-year colleges, 371 public four-year colleges, and 667 two-year public colleges. The study showed that a $1.00 increase in federal Pell Grant aid is associated with a $0.50 increase in tuition and fees in the public four-year sector, but is unrelated to tuition and fees in the public two-year or private four-year sectors. A $1.00 increase in Pell Grant aid is associated with a $0.20 increase in institutional scholarship expenditures in the private four-year sector, but is unrelated to institutional aid in the public two-year and four-year sectors. They found no relationship between federal Pell Grant aid and instructional expenditures in any sector. In addition to the effect on price, the study found a positive relationship between federal Pell Grant aid and institutional aid, indicating that there is no substitution effect with institutional aid.

Li (1999) argued the early work on price response by McPherson and Schapiro was flawed in its theoretical modeling of the relationship between institutional aid and federal aid. She argued that, because the Pell formula considers cost-of-attendance as a component of the formula used to determine the financial need of students, higher tuition by definition creates greater need and larger grants, thereby breaking the causal direction of the model. Li made an important contribution to the empirical work on price response because her study was the first to use both student-level and school-level data. The student-level data came from the Master Files of the Pell Grant Information System for recipients between 1984 and 1994, whereas her institution-level data come from the Computer-Aided Science Policy Analysis and Research Database System (CASPAR) from the National Science Foundation. The sample is limited to students attending the 2,000 institutions in the CASPAR data set.

Li (1999) found that increases in federal financial aid lead to price increases in private and public four-year colleges. She estimated that a $1.00 increase in Pell revenues is associated with a $0.36 increase in list tuition revenues per student and a $0.76 increase in net tuition revenues at public four-year colleges. For private four-year institutions, a $1.00 increase in Pell revenues is associated with a list tuition increase of $1.30 and no change for net price. However, she noted as a limitation to her study that the absence of federal loan data biased these numbers, because private-college students are more likely to borrow. She found little to no change in institutional aid associated with Pell increases in either the private four-year or the public four-year sectors.

Findings for Federal Pell Grants Controlling for Federal Loans

Early studies (Li, 1999; McPherson & Schapiro, 1991, 1993) shared the common difficulty of isolating the effect of Pell Grants on institutional price because growth in the Pell program was slow and consistent until the introduction of changes to the need analysis formula resulting from the 1992 reauthorization of the Higher Education Act (HEA). Later research (Acosta, 2001) improved on the methods of Li and McPherson and Schapiro (1993) with the introduction of the 1992 policy change as a natural experiment to test the effect of Pell expenditures on prices. Beginning with the 1993-1994 academic year, the rule changes excluded the home equity of student's family from the Pell Grant needs analysis. Using an approach similar to McPherson and Shapiro's (1991), Acosta chose a sample of data from IPEDS for 1991-1992 to 1995-1996, and tested for institutional price responses.

Acosta's (2001) study is also an important contribution, because she added loans to the model to isolate the effects of Pell Grants while controlling for the increasing availability of loans; earlier studies did not account for loans. Her study found that increases in both federal loans and federal Pell Grants are associated with increases in tuition at private four-year institutions. In the private four-year sector, a $1.00 increase in federal Pell Grant aid is associated with a $1.48 increase in institutional aid and a $3.24 increase in tuition. An increase in federal loans of $1.00 is associated with an increase in institutional aid of $0.58 and $1.30 in tuition prices. In contrast, for public four-year institutions a $1.00 increase in federal Pell Grant aid is associated with a decrease in institutional grant aid of $0.57 and a small increase in tuition of $0.26. The study found

no significant relationship between federal loan aid and public sector institutional aid or tuition rates.

In response to a request from Congress for an explanation for the rapid growth of college prices, Cunningham et al. (2001) used data from IPEDS institutions from between 1988-1989 and 1997-98 and found no relationship between financial aid and tuition for any type of institution. Using trend analyses of changes in tuition prices, revenues, expenditures, and all forms of student financial aid, they found that, tuition increased faster than the rate of inflation in all postsecondary sectors during the time period. The researchers concluded that state appropriations to institutions are the most important influence on tuition changes, particularly in the public four-year sector. They found no association between aid and tuition, regardless of whether aid is measured as federal grants, federal loans, or state grants. However, they did find that institutional aid is positively associated with tuition increases for public and private comprehensive universities.

Findings for Federal and State Grant Aid at Selective Institutions

Although some researchers (Acosta, 2001; Li, 1999; McPherson & Schapiro, 1991, 1993) studied price response across the national population of institutions, other researchers (Rizzo & Ehrenberg, 2003; Singell & Stone, 2003) who examined institutional price response focused on only a subset of postsecondary institutions and found little evidence of a connection between price and aid. Rizzo and Ehrenberg examined the determinants of tuition and enrollment at public flagship universities. Using a sample of 91 public four-year flagship Research I and Research II universities, data

from IPEDS (1979-1998), and a two-stage least squares regression analysis, they found that federal and state grant programs are not related to increases in either in-state or out-of-state tuition rates.

Singell and Stone (2003) focused their study of price response on highly selective four-year public and private institutions and found that, among these institutions, only the top-ranked private universities increase net tuition in response to increases in federal Pell Grants. Using panel data from CASPAR describing 71 universities between 1983 and 1986, they examined a sample of institutions in the two highest ranked categories as defined by *U.S. News and World Report* rankings. They found no evidence of a relationship between federal Pell Grants and net tuition in the public universities or lower-ranked private colleges. But, for the top private four-year colleges, the tuition to Pell ratio is roughly 4-to-1. They characterized this pricing behavior among top-ranked private universities as their charging full price to wealthy students of high academic standing to subsidize equally qualified needier students. Furthermore, they demonstrated that, in the aggregate, students experiencing the largest price increases in response to Pell Grants attend institutions with the fewest Pell recipients. Without student-level data, however, the distribution of these price changes among students is not observable. The exclusion of student loans from their regression analysis may have also biased their estimation of the effects of Pell Grants on price increases at expensive elite institutions, causing them to overestimate the effect.

Summary of Findings on Federal and State Grant Aid

Researchers found that institutional price response to federal and state grant aid revenues varies considerably across institutional sectors (Acosta, 2001; Cunningham et al., 2001; Li, 1999; McPherson & Schapiro, 1991, 1993; Rizzo & Ehrenberg, 2003; Singell & Stone, 2003). However, because of different sample periods, controls, and methods, studies offered inconsistent conclusions about price response effects for institutions in the private four-year and public four-year sectors. Variations across states in who is authorized to set tuition rates may also contribute to the inconsistent findings across sectors. For the private four-year sector, some (Acosta, 2001; Li, 1999) concluded that federal Pell Grant aid is associated with increases in prices, although others (McPherson & Schapiro, 1991, 1993; Rizzo & Ehrenberg, 2003) found no effect. Similarly, for the public four-year sector, some concluded that federal Pell Grant aid is associated with increases in prices (Acosta, 2001; Li, 1999; McPherson & Schapiro, 1991, 1993), although others (Cunningham et al., 2001; Rizzo & Ehrenberg, 2003) found no relationship.

At least five conclusions may be drawn about the empirical approaches in earlier research. First, IPEDS is the primary source of data. Second, federal aid programs are the main focus. Third, data are drawn from national populations, and in the analyses there is an attempt to control for state and institutional differences. Fourth, samples are limited to four-year institutions with no attention to two-year institutions or for-profit institutions. Fifth, inconsistencies in findings for price response across different sectors may be attributed to differences in how researchers treat loans and direct appropriations in their models. Some researchers omitted loans as a source of revenue in their price response

models but included direct appropriations (Li, 1999; McPherson & Schapiro, 1991, 1993; Rizzo & Ehrenberg, 2003). Other research omitted direct appropriations (Acosta, 2001), whereas another study established a significant relationship between price and direct appropriations (Cunningham et al., 2001). Other common limitations of studies that focused on Pell Grants were that a small percentage of students qualify for federal Pell Grants in relation to total enrollments, the size of the average amount of Pell Grants is small in relation to total tuition and fees, and year-to-year shifts in the amount of the Pell are minimal. All of these limitations make empirical measurement of the effects of federal grant aid difficult.

State Merit-Based Aid

Within the price response literature only one researcher (Long, 2002, 2003) examined the effect of state merit-based aid programs on institutional prices, and she concluded that four-year institutions raise tuition and fees in response to state merit-based aid. Long used the introduction of state merit-based aid in Georgia as a natural experiment to study the effect of the HOPE program on institutional prices and found that both public and private four-year colleges respond to HOPE by increasing either tuition or fee charges. Long further concluded that HOPE caused these changes because institutions with the highest concentration of HOPE recipients had the greatest changes in prices.

Long (2002, 2003) reached these conclusions by using a fixed-effects approach, several controls for state characteristics and college attributes, and data from IPEDS and the Georgia Higher Education Commission. She examined effects of the introduction of

HOPE on changes in four outcomes: appropriations, tuition and fee charges, institutional grant funding among private institutions, and instructional expenditures. Long argued that all the outcomes were possible, because, depending on institutional choices, HOPE could lead to increases in student charges as institutions seek to capture a portion of the new HOPE revenues, or HOPE could lead to reductions in other forms of financial aid as institutions use HOPE funds to substitute for institutional aid expenditures. Or, in response to HOPE, institutions could reduce investments for cost of instruction, because institutions have less incentive to invest in quality when the HOPE program gives institutions an automatic competitive price advantage over out-of-state institutions.

In addition to finding that both public and private four-year colleges responded to the HOPE program by increasing either tuition or fee charges, Long (2002, 2003) found that institutions in the private four-year sector responded to HOPE by decreasing institutional aid and that institutions in the public four-year sector responded by increasing room and board fees. For institutions in all sectors, instructional expenditures did not decline and direct appropriations actually increased, possibly because HOPE funds came from the state lottery and not the state budget.

Because she studied the effect of a state program on institutional price within one state, Long's study overcame the methodological problems of earlier studies that ignored state-by-state differences in tuition-setting policies and used a national sample of postsecondary education institutions to examine the effect of loans (Acosta, 2001) or grants (McPherson & Schapiro, 1993). In some states, the legislature or higher education coordinating board sets tuition rates for public institutions, thereby making it hard for campus administrators to alter tuition prices in response to aid (Baum, 2005; Long, 2002,

2003). Long's study is also a superb contribution to the price response literature because the use of a natural experimental method allowed her to draw conclusions about the causal connection between government grant aid and institutional price response.

Because of the contradictory findings of national studies that attempted to assess the effect of government grant aid on institutional prices and because of the ways that state context affects the relationship between government grant aid and institutional prices, additional state-specific studies are desirable extensions of existing research. Although Long's (2002, 2003) findings for the program in Georgia shed light on the relationship between state aid and institutional price response, the findings do not necessarily represent the experience in other states and do not predict the effects of new programs in other states, especially in states whose postsecondary education structure and student demographics significantly differ from Georgia's. Florida, the subject of this study, has almost twice the number of postsecondary institutions and postsecondary enrollments compared with Georgia, faces a different set of out-of-state competitors, has a substantially higher share of private institutions, and has a different racial, ethnic, and socioeconomic demographic distribution.

In the next section empirical studies on the effects of state merit-based aid on student and institutional responses other than pricing are summarized. Although the focus of this study is on institutional responses to state merit-based aid and specifically price response, much of the existing research on merit-based aid programs focuses on the behavioral responses of students to these new forms of aid. A review of this body of literature relates this study on state merit-based aid in Florida to the existing empirical work on state merit-based aid and positions this study's research questions within what is

currently known and not known about the effect of these programs on students and institutions. A summary of the findings and a discussion of areas for further research follows.

Research on State Merit-Based Aid

Because states began introducing large-scale merit-based aid programs only in 1993, empirical research on these programs is relatively new compared with research on other financial aid programs. Because states attempt to achieve a diversity of goals through these programs, this body of empirical research examines the effects of state merit-based aid on a range of student outcomes: eligibility rates, college enrollment choices, academic performance in high school, and such academic outcomes in college as course withdrawal, credit load, retention, and summer school enrollment. This review of research on state merit-based aid considers all the different outcomes researchers have studied to understand what is known about the effect of these programs and to determine where further research is needed. Many existing studies look at variations in outcomes by student demographic characteristics, most commonly race, gender, income, and socioeconomic status. Also included are the few studies that examine how institutions' demographics and student academic quality change in response to state merit-based aid.

A review of the literature on state merit-based aid reveals broad similarities in methodologies, data sources, and samples. Many studies rely heavily on descriptive analyses and examine students attending institutions in a single state or institution. Most researchers use a combination of data sources, including Census or Current Population Survey data, federal and state Department of Education data, survey data such as IPEDS,

and state-provided financial aid data. The majority of studies focus on students in Georgia, because Georgia was the first state to institute a broad-based, merit-based aid program. Because of the isolated introduction of Georgia HOPE, researchers such as Long (2002, 2003) were able to use quasi-natural experimental techniques and surrounding states as a control group. Other researchers (Binder et al., 2002; Heller & Rasmussen, 2001; Ness & Tucker, 2005) analyzed the effects on student outcomes of merit-based programs in Florida, Michigan, Tennessee, and New Mexico, and some (Farrell, 2004b; Heller & Rasmussen, 2001) examined the effects of two or more state programs.

In both of their two comprehensive reports on state merit-based aid, Heller and Marin (2002, 2004) concluded that the goal of increasing access to college is not being met through state merit-based aid. Heller and Marin's (2002) compilation included analyses from a 2001 research symposium organized by The Civil Rights Project at Harvard University in response to the tremendous growth and popularity of merit-based aid programs. Heller and Marin's (2002) report included an overview of state merit-based aid programs and analyses of who qualifies for and receives the aid in Florida, Michigan, Georgia, and Tennessee, emphasizing inequities in who benefits from these subsidies as well as an analysis of institutional responses to merit-based aid in Georgia. Heller and Marin (2004) updated their initial report with a second compilation of research on state merit-based aid, adding a detailed examination of programs in Massachusetts, Indiana, Alaska, Florida, and Kentucky, and furthering the inquiry into the distributional equity of these programs. In both of these compilations the researchers concluded that, in general,

the studies in the reports confirm that use of traditional measures of merit, such as grades, standardized test scores, and curricular test scores:

> …results in scholarships that are awarded disproportionately to students who were likely to attend college even without the public assistance…in contrast to need-based aid programs, which have been demonstrated to have an important role in promoting college access and attainment for underrepresented students. (Heller & Marin, 2004, p. 20)

In short, Heller and Marin concluded that merit-based aid programs do little to help close the gaps in college participation within a state.

Variations in Qualifying for and Receiving State Merit-Based Aid

Most research shows that high-income students and White students disproportionately qualify for state merit-based aid awards (Farrell, 2004a, 2004b; Heller & Rasmussen, 2001, 2002; Heller & Rogers, 2003; Ness & Noland, 2004). Heller and Rasmussen (2001, 2002) compared variations in who qualifies for and receives merit-based aid in Florida and Michigan to explore how student socioeconomic background is related both to eligibility for merit-based aid and probability of receiving merit-based aid. They found that, compared with Black and Hispanic students, White students are overrepresented among both those who meet the scholarship eligibility criteria and those who receive the scholarship. Subsequent research by Heller and Rogers on students in Michigan found variations in qualification across income for all three of the qualification conditions: taking the state of Michigan's core academic area qualifying exams, scoring a Level I or II on the qualifying exams, and scoring in the top quartile on the ACT or SAT.

Similarly, Heller and Rasmussen (2001, 2002) found that high-poverty secondary schools in both Michigan and Florida have fewer merit-based aid scholarship recipients than low-poverty secondary schools and that schools with higher college-participation rates before program implementation have greater proportions of the awards than schools with lower pre-implementation college participation rates. The research showed that, compared with Florida, Michigan has a disproportionately high number of eligible students in its high-income secondary schools, in part, because Michigan's state merit-based aid program has more rigorous academic eligibility requirements than Florida's. Heller and Rogers concluded that groups most underrepresented in higher education are the least likely to be awarded merit scholarships, and this pattern increases when the eligibility criteria are more academically rigorous.

Other researchers found inequities in eligibility for Florida's merit-based aid award (OPPAGA, 2003). Florida high school students qualify for two different merit-based academic awards by completing 15 credits of college preparatory courses and scoring at specified levels on their GPA and ACT or SAT. Different requirements determine eligibility for a third award for students on vocational paths. Similar to the Michigan studies (Heller & Rasmussen, 2001, 2002; Heller & Rogers, 2003), OPPAGA researchers found racial disparities in who qualifies for the scholarships in Florida. Specifically, White and Asian students are overrepresented among the academic scholarship recipients and underrepresented among the vocational scholarships.

Using data from 12 states with merit-based aid programs in 2002, Farrell (2004a) concluded that most states had not achieved the goals of their programs, such as increasing college participation, improving high school achievement, and keeping

students in-state. She used data from Census, IPEDS, and Common Core of Data, supplemented by state specific data where available. Farrell found that, when comparing the rates of merit-based aid awards for county-level populations, White students are more likely to receive merit-based aid than Black students, and students from suburban or low-poverty districts are more likely to receive merit-based aid than their peers in urban high-poverty districts. She concluded that race and income are highly related to qualification for merit-based aid with White and wealthy students the most likely to qualify for merit-based aid in every state in her study.

Ness and Noland (2004) studied the sensitivity of different student populations to scholarship qualification rules by applying the academic criteria for the Tennessee Education Lottery Scholarship (TELS) to the state populations of Florida, West Virginia, and Louisiana. Ness and Noland found that some underrepresented students are more likely to qualify under less academically rigorous criteria. TELS allows students to qualify by meeting either GPA requirements or minimum scores on college entrance examinations. With these eligibility criteria, 65% of Tennessee high school graduates qualify for the aid. Using student ACT college entrance score data over 2001-2003 and descriptive analyses, they found that, if the comparison states were to use the TELS optional GPA or test score criteria, the proportion of qualifying low-income Black students in these states doubles. The research illustrated the importance of differentiating between merit-based aid programs with different qualification rules and interpreting outcomes within their state contexts and suggested the limitations of generalizing findings about a particular state merit-based aid program to other states.

Overall, research on the distribution of state merit-based aid indicated that low-income students and Black and Hispanic students are underrepresented among those who qualify for and receive these awards (Farrell, 2004a; Heller & Rasmussen, 2001, 2002; OPPAGA, 2003). Researchers found that groups most likely to be underrepresented in higher education are the least likely to be awarded merit scholarships, and this pattern increases when the eligibility criteria are more academically rigorous (Farrell, 2004a; Heller & Rogers, 2003). When eligibility criteria are more flexible, more low-income minority students qualify for the aid (Ness & Noland, 2004).

College Enrollment Choices in Response to State Merit-Based Aid

Researchers have reached different conclusions about the extent to which merit-based aid increases college enrollment (Binder et al., 2002; Cornwell et al., 2004; Dynarski, 2000, 2002, 2004), one of the explicit goals of most state programs. With data on southeastern students from IPEDS, Census, and the Southern Regional Educational Board between 1988 and 1997, Cornwell et al. (2004) used descriptive and regression analyses to show that Georgia HOPE increases enrollment of freshmen at four-year Georgia colleges by 6%. Cornwell and colleagues attributed most of this change to an increase in the number of freshmen who stay in-state rather than attend college out-of-state. For freshmen who recently graduated from high school and attended four-year colleges, two-thirds of the program's effect is explained by a decrease in the likelihood of leaving the state. They also concluded that the increase in Georgia enrollments is greatest among Black students as a result of a surge in enrollment of Black HOPE recipients in Georgia's historically Black four-year colleges.

Similar to Cornwell and colleagues (2004), Dynarski (2000) determined that HOPE increases college attendance rates among Georgia's 18-19 year olds by 7-9% relative to the attendance rates in the rest of the Southeast. She concluded that the rate of attendance increases 4% for every $1,000 in merit-based aid. Contrary to Cornwell et al. (2004), Dynarski found that merit-based aid has the greatest effect on the college enrollment rates of middle- and upper-income and White rather than low-income and Black students.

Later work by Dynarski (2002, 2004) demonstrated that HOPE is primarily influencing a shift in the quality of institutions selected by students rather than an increase in general access to college. As Cornwell et al. (2004) found, Dynarski (2002, 2004) found that merit-based aid programs are associated with a higher probability that high school students stay in-state to attend college. Dynarski (2002, 2004) also showed that the effect of merit-based aid on college enrollment differs by race. She found that, for all students, HOPE increases the probability of attending a four-year public or four-year private institution rather than a two-year institution, but that HOPE has a much greater effect on four-year college attendance by White students than on four-year college attendance by Black or Hispanic students.

In contrast to the work of Dynarski (2000) and Cornwell et al. (2004) for Georgia, Binder, Ganderton and Hutchens (2002) discovered no change in the rate of in-state college enrollment after the introduction of New Mexico's merit-based aid program. However, they did find changes in the composition of the student body at the University of New Mexico and that Native Americans increased their share of enrollment after the introduction of the merit-based program. Specifically, Binder et al. (2002) found that the

proportion of students at the University of New Mexico from low-income families declined after the introduction of the scholarship program but that the proportion of students with lower academic ability increased. Although they found no change in the overall rate of New Mexico students going to college associated with the introduction of the merit-based aid program, Binder et al. found a shift in enrollment from two-year institutions to four-year institutions for New Mexico students compared with enrollment patterns in Colorado and Arizona.

The generalizability of findings about the effects on enrollment of particular state merit-based aid programs is likely to be limited given differences in the specifications of each state's merit-based aid program. New Mexico's scholarship program differs from Georgia's in that a student qualifies for the New Mexico award based on academic performance during the first year of college rather than during high school. Any student who enrolls in a full course load and achieves a first semester 2.5 GPA receives free tuition at a two- or four-year state-supported institution in New Mexico for eight semesters.

In each of the Georgia studies (Cornwell et al., 2004; Dynarski, 2000, 2002, 2004) changes in enrollment before and after the introduction of Georgia HOPE were compared with changes in enrollment in the same period in states across the Southeast. This approach was limited by the use of aggregate data from a national source, such as Census and IPEDS. These sources lack the data necessary to control for other changes in the student populations such as academic preparation. Binder et al. (2002) used a similar before and after approach, comparing changes in New Mexico with changes in other

states in the Southwest. In spite of the limitations, these researchers used the best available data to examine the effect of merit-based aid on enrollment.

Although most researchers examined aggregate enrollment response and its variation by student demographics and institutional type, Ness and Tucker (2005) considered how students' thinking about college changes in response to the availability of the merit-based scholarship in Tennessee. Using survey data, Ness and Tucker found that students who are traditionally underrepresented in college self-report that the availability of merit-based aid strongly influences their decision to consider college enrollment. Their descriptive analysis suggested that Black students are more likely than White students to report considering enrolling in college because of the availability of merit-based aid in their state. Similarly, students with family incomes of less than $36,000 (the need-based qualification cap in Tennessee) are more likely than students from higher income families to view merit-based aid as critical to their consideration of college enrollment. They also found that students with parents of lower education levels more frequently report that the scholarship is very important to their college decision-making. Even when students who described themselves as "not planning to go to college" were excluded from the sample, the study indicated that Black students and other minorities are more likely than White students to report the positive influence of merit-based aid on their enrollment intentions.

Two aspects of Ness and Tucker's (2005) study design limit the usefulness of the findings. First, the income variable is based only on the self-reports of students. Second, the outcome variable is a simple dichotomous yes/no response on a questionnaire indicating whether or not the scholarship influences the student's decision about whether to attend rather than actual enrollment behavior. Regardless of these limitations, this

study is the first, to my knowledge, to suggest a connection between the awareness of state merit-based aid among high school students and their decision-making about college enrollment.

In summary, studies showed that increases in college enrollment are associated with merit-based aid programs in Georgia (Cornwell et al., 2004; Dynarski, 2000, 2002, 2004) but not in New Mexico (Binder et al., 2002). Research also showed that in both Georgia and New Mexico merit-based aid programs are associated with shifts in enrollment from two- to four-year institutions (Binder et al., 2002; Dynarski, 2002, 2004). Researchers found conflicting indicators of the effects of state merit-based aid on enrollment increases for White students compared with Black students (Cornwell et al., 2004; Dynarski, 2002, 2004). Dynarski found that merit-based aid has more effect on the college enrollment rates of middle- and upper-income students and White students than low-income students and Black students because of the increased likelihood of students staying in-state to study. Although Ness and Tucker (2005) did not study enrollment, their study of the intentions of students to enroll showed that Black students, low-income students, and students from families with low education levels are more likely than other students to self-report that merit-based aid positively influences their thinking about going to college.

Academic Preparation and Performance in High School

The small number of studies on the effects of state merit-based aid on academic achievement and preparation for college do not agree on whether the programs function as an incentive for student performance in high school (Bugler et al., 1999; Heller &

Rogers, 2003; Henry & Rubenstein, 2002). Heller and Rogers found little change in the academic preparedness of students before and after implementation of the merit-based aid program in Michigan for the class of 2000. Using bivariate analyses of data trends of high school student cohorts in 2000, 2001, and 2002 in Michigan, researchers found inconsistent changes between cohorts in their academic achievement levels. They examined three outcomes: the portion of each cohort taking all four Michigan 11th grade achievement tests, the percentage of students who pass at least two of the achievement tests, and the share of students who score in the top quartiles on the SAT or ACT. Although there are racial disparities in the rates of achievement (as described above), the analyses showed an increase in overall academic achievement as measured by state achievement tests between the 2000 and 2001 cohort, and a decrease between the 2001 and 2002 cohorts.

Heller and Rogers (2003) observed no change in the ACT scores (the test taken by the majority of Michigan students) after the implementation of merit-based aid and only small improvements in the mean SAT scores. The researchers concluded that the initial gains in the rates of qualification may primarily be a result of publicity surrounding the availability of the merit award in its first year. Because state achievements tests are administered to students in the 11th grade, the 2000 cohort of high school graduates had no opportunity to improve their performance. However, the publicity surrounding the program may have provided students in the second cohort, who did improve their scores, time to better prepare for the standardized state exam required for qualification. Furthermore, Heller and Rogers found that most of the gains in test scores occurred among White students rather than Black, Native American, and Hispanic students.

Other researchers found that a growing share of students in Florida improved their academic performance to qualify for the Bright Futures merit-based aid award (OPPAGA, 2003). The descriptive analysis in the OPPAGA evaluation showed that the percentage of high school graduates who took all the courses required by the Bright Futures academic scholarships increased from 54% in 1997 to 65% in 2001, four years after the program launch. Over the same period, the average GPA for students also improved. Researchers found that the share of students meeting the academic standards of the scholarship rose from 26% to 30% over the same time period. Although the researchers found racial disparities in who reaches the academic standards of the awards in Florida, their analysis indicated that the academic preparation level of various at-risk populations improved. The share of graduates taking more academically rigorous course work increased over the study period for Black, Hispanic, and students with limited English proficiency students, as well as students receiving free and reduced-price lunches. In contrast to improvements in classroom performance, OPPAGA found that the scores of college entrance exams declined in Florida over the study period.

Research on state merit-based aid in Georgia showed that the HOPE program improves academic achievement and encourages taking college preparatory course work in high school (Henry & Rubenstein, 2002). Using student-level data on all Georgia high school graduates from the Georgia Student Finance Commission and the Board of Regents between 1988 and 1998, Henry and Rubenstein found that the portion of high school graduates who meet the academic requirements for HOPE increased from 47% in 1993 to 60% in 1998, five years after the launch of HOPE. On average, SAT scores and high school GPAs increased over the same period for seniors in college preparatory

tracks in Georgia high schools. Furthermore, in response to the program, a higher share of students graduated from Georgia high schools with college preparatory diplomas rather than standard high school diplomas, and the number of Advanced Placement (AP) exams taken per 100 students doubled during the 10-year study period.

Bugler et al. (1999) argued that grade inflation does not explain the improved academic performance among students in Georgia after the introduction of HOPE. Bugler et al. used ordinary least squares regression to explore the extent to which improved academic performance is explained by grade inflation rather than actual increases in student performance. At the national level, they found a trend of grade inflation with a growing portion of the U.S. student population receiving higher grades at the same time that average SAT scores were falling. But, for first-year HOPE recipients, the correlation between SAT scores and high school grades in core courses grew stronger after the introduction of HOPE. Looking just at students who took a college preparatory curriculum and who were closest to the GPA cutoff for HOPE (e.g., those whom Bugler and colleagues hypothesized are the most likely to have grades inflated), they found that SAT scores increased between 1993 and 1999 for all races, genders, and preparation levels. They concluded that grade inflation does not explain the increases in GPA in Georgia, because students are still taking a college preparatory curriculum and are performing better academically after HOPE.

Henry and Rubenstein (2002) argued that, because the incentive effect provided by the scholarship program motivates students to higher academic achievement, the program "improves the quality of K-12 education in Georgia and reduce[s] racial performance disparities by motivating students and their families to commit greater effort

to schooling" (p. 93). They hypothesized that if students "apply more time and effort to schoolwork relative to leisure to secure higher grades, the quality of education is enhanced" (p. 96). They hypothesized that the incentive effect should be more important for low-income students, because these students have the most to gain. Henry and Rubenstein found that, after 1997, the first year that high school graduates would have known about HOPE for all four years of secondary school, SAT scores and GPA rose for all groups. They also found that, whereas SAT scores increased for all groups, Black students in Georgia performed better on the SAT than the national average for Black students after the introduction of HOPE. Henry and Rubenstein speculated that Black student performance responded more strongly to HOPE than White student performance because the publicity about the program increased awareness of financial aid opportunities among Black students from lower-income backgrounds to a greater degree than their White counterparts. Because this study did not control for the income or socioeconomic status of students, the researchers did not test this potential explanation for the relationship.

In summary, research is inconclusive as to whether state merit-based aid programs provide an incentive for students to perform better academically in high school. Some researchers (Heller & Rogers, 2003) found little change in academic performance for students and almost no change in academic performance for Black students in Michigan. Other researchers (OPPAGA, 2003) found that academic preparation among students in Florida increased for all indicators except test scores. Still other researchers (Bugler et al., 1999; Henry & Rubenstein, 2002) found that grade inflation does not explain the increase

in student GPAs in Georgia because both enrollment in college preparatory curricula and grades are positively correlated with increases in college entrance exam scores.

Academic Behaviors in College

Several researchers found that state merit-based aid programs negatively affect college behavioral outcomes (Cornwell et al., 2005; Dee & Jackson, 1999; Henry et al., 2004), with one exception (Dynarski, 2005). Because most state merit-based aid programs have a college GPA requirement to maintain the scholarship, these studies showed that merit-based aid affects course withdrawal, credit load, retention, summer school enrollment, and choice of major.

Cornwell et al. (2005) found that students who received the merit scholarship in Georgia were more likely than nonrecipients to take lighter course loads, withdraw from courses, and incur extra costs to enroll in summer school courses to maintain the GPA required for scholarship renewal. Using descriptive and regression analyses of data from the financial aid and registrar offices for University of Georgia undergraduates between 1989 and 1997, Cornwell et al. found that HOPE reduced full course-load enrollments for all students by 4.2 percentage points, and increased course withdrawal by the same amount. Among freshmen, in the eight-year period included in the study, HOPE reduced the probability of full-load course taking by 16 percentage points. The study indicated that, after the introduction of HOPE, Georgia students with the lowest GPAs were 5.8 percentage points less likely to take a full load and 11.2 percentage points more likely to withdraw from courses. The analysis showed that summer-school credits were 63

percentage points and 44 percentage points higher in the two summers following the first matriculation of HOPE scholars.

Another unintended consequence of the college GPA requirement is that recipients of state merit-based aid are inclined to enroll in less challenging academic majors. Dee and Jackson (1999) investigated the characteristics of students in the 1996 cohort of HOPE recipients at Georgia Tech who lost their scholarships because of failure to maintain the minimum 3.0 GPA. Their descriptive analyses showed that 57% of recipients lost the scholarship after the first year. They found that students in engineering, science, and computing were more likely to lose their scholarship than students in other disciplines, that men lost it more often than women, and that Black students lost it more often than White students. The demands of keeping the scholarship appeared to be greatest for students studying in the engineering and science fields, where, even after controlling for academic ability, researchers found that, students in these fields were prone to lose their scholarship (Dee & Jackson, 1999). Researchers found that, after controlling for ability by using SAT and high school GPA as proxies, differences in who maintains their scholarship by race and gender are minimal. However, researchers found that, after controlling for the choice of academic major, substantial differences in scholarship loss indicate that the grade requirement in HOPE may disproportionately harm students in more difficult academic disciplines.

Other researchers found that the effect of Georgia HOPE on college persistence is greater for those who lose the scholarship during the first year of college than for those who either never receive a HOPE award or who receive and retain their award (Henry et al., 2004). Using data from the Georgia Finance Commission, Henry et al. analyzed a

sample of Georgia students in 1995-1996 who had a GPA one point over the HOPE high school grade requirement. This sample was selected to compare differences in college persistence between HOPE recipients just above the HOPE eligibility criteria and similar nonrecipients. The results of their logistic regression analysis indicated that students who receive merit awards and fail to keep them after their first semester are less likely to ever receive a degree within four years than those who never receive the scholarship. Henry et al. concluded that the value of HOPE as a mechanism for improving persistence diminishes as a result of scholarship loss, and in some cases students who receive HOPE and lose it appear to be worse off than those who never received it at all.

In contrast to other researchers (Cornwell & Mustard, 2005; Dee & Jackson, 1999; Henry et al., 2004), Dynarski (2005) found positive academic outcomes, such as higher levels of degree completion for Georgia HOPE recipients than a small subsample of Georgia nonrecipients (Henry et al., 2004). Dynarski's study explored the relationship between merit-based aid programs and degree completion before and after the introduction of Georgia HOPE, using a sample from the 2000 decennial Census microdata of 22-34 year olds born in the United States. She found the probability that a student will persist to a baccalaureate degree increased by 3 percentage points in Georgia after the introduction of merit-based aid scholarships. Furthermore, she showed that the increase in degree completion is most pronounced for women: White women increased completion by 3.2 percentage points; Hispanic women increased by 7 percentage points; and non-White women increased by 6 percentage points. Her study also included a cost-benefit analysis of the merit-based programs, and, based on this analysis, she argued that tuition reduction through HOPE may be an efficient method for increasing college

completion. In short, Dynarski's findings suggest that HOPE has a positive effect on degree achievement in the state of Georgia.

In summary, research indicates that academic behaviors in college are negatively affected by state merit-based aid because students take lighter course loads, withdraw from courses more frequently, and incur costs to enroll in more summer school courses (Cornwell & Mustard, 2005; Dee & Jackson, 1999; Henry et al., 2004). Students enrolled in difficult academic disciplines, such as science and engineering, are most likely to lose their merit-based aid awards, potentially discouraging students from taking difficult academic majors (Dee & Jackson, 1999). Research suggests conflicting evidence about the effect of merit-based aid on degree completion. Those who receive merit-based aid in Georgia and subsequently lose the scholarship appear to be less likely to ever complete a degree than those who never received merit-based aid (Henry et al., 2004). Yet, other research indicates that the introduction of Georgia HOPE increases baccalaureate completions for the population as a whole (Dynarski, 2005). Most analyses on academic behaviors focused on the effects of Georgia HOPE. This area of student behavioral response to merit-based aid needs to be expanded to other states because the effects or the aid program may differ, depending on eligibility requirements for the program and scholarship maintenance rules.

Institutional Responses to State Merit-Based Aid

Few studies have examined the effect of state merit-based aid on aspects of institutions other than net price. The research shows that the introduction of merit-based programs corresponds with changes in the selectivity of institutions in terms of applicant

admission and yield rates and the academic quality of students enrolling in institutions (Cornwell et al., 2005; Cornwell & Mustard, 2006; Singell, Waddel, & Curs, 2004).

Some research (Cornwell et al., 2005) suggested that the academic quality of students improves when merit-based aid is introduced. Using descriptive and regression analyses on data from the financial aid and registrar offices for University of Georgia undergraduates between 1989 and 1997, Cornwell et al. found that, on average, the quality of in-state and out-of-state students increases after the introduction of HOPE when quality is measured by SAT scores, AP credits, and high school GPA. More recent analyses by Cornwell and Mustard (2006) indicated that the academic quality of students and the selectivity of institutions increased in Georgia and surrounding states after the introduction of HOPE. Their analysis showed that, at the most competitive four-year institutions, students with higher academic qualifications enroll at greater rates following the introduction of HOPE, making the student bodies more academically homogenous at the top Georgia colleges relative to institutions in other southern states. They also found that, at the most competitive institutions, application rates increase while acceptance rates decline, thereby increasing selectivity at these institutions. Student ability becomes more homogenous at the highest-quality institutions and more heterogeneous at the lowest quality institutions as those with lower academic quality trickle down to the less selective institutions, thereby exacerbating stratification by ability in colleges. Cornwell et al. (2006) showed that acceptance rates in Georgia decreased for all institutions in Georgia after HOPE was introduced and decreased most severely at universities that were most space constrained and most selective.

In other states where HOPE-like programs are present, regression analyses showed increases similar to Georgia's in the average academic quality of students enrolled in four-year colleges and universities (Cornwell & Mustard, 2006). Arkansas, Kentucky, and South Carolina all had increases in average institutional SAT scores after the introduction of merit-based aid programs. Also, the share of students from the top 10% of their high school class enrolled in in-state institutions increased in Arkansas, Florida, Georgia, and Kentucky.

Another change in institutional demographics after the introduction of HOPE is an increase in the number of Pell recipients in Georgia institutions relative to other southern states (Singell et al., 2004). Singell et al. found that this growth is concentrated in less selective four-year and two-year institutions. When IPEDS data, federal Pell data, and economic data from Census were used, their regression analyses indicated a decline in the size of the average Pell award by 7.3% overall, suggesting that HOPE draws less needy students into the total population of Pell awardees. In the two-year sector they found an 18.4% decrease in the average Pell award in Georgia. But, although average Pell awards decreased in the two-year sector, overall Pell expenditures to these institutions rose as a result of increased identification of Pell eligible students and increased enrollment. Based on this finding, Singell et al. concluded that Georgia is "able to leverage its [merit] scholarship dollars with greater federal support" (p. 25). However, the important caveat they mentioned is that the observed increase in low-income Pell recipients enrolled is concentrated mostly in less-selective institutions.

Overall, state merit-based aid in Georgia is associated with increases in student quality at Georgia institutions as well as increased stratification of students by ability

(Cornwell et al., 2005; Cornwell & Mustard, 2001, 2006). Some researchers contend that the enrollment of low-income students increases in response to merit aid, based on evidence of an increased number of Pell recipients in Georgia institutions after the introduction of HOPE. However, it is unclear that equal access to college opportunities for low-income student improves from the existence of merit-based aid, because the growth is concentrated in less-selective institutions (Singell et al., 2004).

Summary

Most research on state merit-based aid has focused on the effect of these programs on the behavior of students, with more limited attention to the effect these programs have on such institutional attributes as demographic composition, student quality, and price. The empirical studies on the effects of state merit-based aid on student outcomes found the following:

1. Students most likely to be underrepresented in postsecondary education, e.g., those from low-income backgrounds and those who are Black and Hispanic, are underrepresented among those who qualify for and receive these awards (Farrell, 2004a; Heller & Rasmussen, 2001, 2002; Heller & Rogers, 2003; OPPAGA, 2003).
2. Increases in college enrollment are associated with the introduction of merit-based aid in Georgia (Cornwell et al., 2004; Dynarski, 2000, 2002, 2004) but not in New Mexico (Binder et al., 2002).
3. Merit-based aid has no significant effect on academic achievement in high school or test scores in Michigan (Heller & Rogers, 2003) but is associated with

improved achievement in high school in Florida (OPPAGA, 2003) and improved achievement and test scores in Georgia (Bugler et al., 1999; Henry & Rubenstein, 2002).

4. Merit-based aid has a negative effect on students' academic choices in college, such as course load and choice of major (Cornwell & Mustard, 2005; Dee & Jackson, 1999; Henry et al., 2004), although one study suggests that it improves baccalaureate degree completion (Dynarski, 2005).
5. After the introduction of Georgia HOPE, the composition of institutions changed to greater homogeneity of student ability at more selective institutions, greater racial disparity across institutions, and a general increase in student quality (Cornwell et al., 2005; Cornwell & Mustard, 2001, 2006).

The inconsistent findings across multiple states suggest that effects on enrollment and high school achievement outcomes associated with state merit-based aid depend on the state context and the specification of the merit-based aid program. Therefore, conclusions about the effects of state merit-based aid programs drawn from a study of one state may not apply to other states. Focusing on a single state recognizes the role of state context and allows for an examination of the state-specific effects of state aid programs on student and institutional responses (Perna, 2006; Perna, Steele, Woda, & Hibbert, 2005). Researchers also find significant variations in effects in state merit-based aid policies that are similarly structured because of differences across states in economic conditions, K-12 educational quality, the supply of postsecondary education, and the demographics of that particular state (Farrell, 2004a; Perna & Titus, 2004).

This literature review also highlights the scarcity of inquiry into the behavior of postsecondary institutions in response to the introduction of state merit-based aid programs. Although Long (2002, 2003) examined effects on institutional price, other institutionally focused research examined changes in the demographic and achievement levels of student populations without consideration of institutional pricing behavior (Cornwell & Mustard, 2005; Cornwell & Mustard, 2006; Singell et al., 2004). However, economic theories predict that subsidies such as merit-based aid interact with decision on student human capital, institutional enrollment, and pricing to simultaneously determine institutional price and the composition of the student body. Therefore, further research is needed that considers the role of institutions in the outcomes of state merit-based aid programs.

Summary

This literature review shows that the relationship between student financial aid and institutional price varies, depending on state context, the type of financial aid, and the eligibility details of the aid (Acosta, 2001; Li, 1999; Long, 2003; McPherson & Schapiro, 1993). Also, this literature review demonstrates that earlier research on state merit-based aid programs paid little attention to the behavior of postsecondary institutions, but focused primarily on student response. One exception is Long's (2002, 2003) research that used natural experimental techniques by exploiting the introduction of merit-based aid in Georgia. In this dissertation the research on institutional price response is furthered by application of an economic theoretical framework to the introduction of merit-based aid in the state of Florida.

In establishing merit-based aid programs, state policymakers may intend to reduce net price, encourage higher rates of total in-state enrollments, and/or improve the academic quality of students in their state institutions. Florida's Bright Futures program explicitly aims to reward academic achievement by lowering the price of postsecondary opportunities in the state. This dissertation predicts that the price response of some postsecondary institutions inhibits the effectiveness of state merit-based aid programs in achieving state policy goals, because institutions make choices regarding tuition and fee revenues, enrollment numbers, and student quality that are inconsistent with their state's policy goals. As a result of differences in institutional missions and resources, institutional responses to state merit-based aid programs are predicted by theory to differ across postsecondary education sectors defined by control (public, private, and for-profit), location (in-state or out-of-state), and level (two-year and four-year) (McPherson & Schapiro, 1991; Winston, 1999). This study of merit-based aid in the state of Florida extends current research about the active role that institutions play in the outcomes of state merit-based aid programs.

RESEARCH DESIGN AND METHODOLOGY

CHAPTER 3

Introduction

This study extends two bodies of research, one that analyzes institutional price response to student financial aid and a second that examines the effect of state merit-based aid programs on institutions, by examining changes in tuition and fees, room and board charges and institutional aid expenditures following the introduction of the Bright Futures merit-based aid program in Florida. Applying an economic theoretical framework to postsecondary education pricing, this study explores how institutions respond to the introduction of a new aid subsidy and how this response varies for different types of postsecondary institutions. Using descriptive and ordinary least squares regression analyses that include year fixed-effects and other controls, this study uses institution-level data from the Integrated Postsecondary Education Data System (IPEDS) and the Florida Bright Futures program to explore the following research questions for each of four sectors of postsecondary education (public four-year, public two-year, private four-year, and for-profit institutions):

1. How do the levels of tuition and fee charges, room and board charges, and grant aid expenditures at Florida colleges and universities compare with the levels at institutions in other states?
2. How do the annual changes in tuition and fee charges, room and board charges, and grant aid expenditures at Florida colleges and universities compare with

changes at institutions in other states after the introduction the Bright Futures merit-based aid program?

3. Relative to a comparison group of institutions in surrounding states, how do tuition and fee charges, room and board charges, and grant aid expenditures at Florida colleges and universities react to the introduction of the state merit-based aid program after controlling for institutional and state economic characteristics?

This chapter begins with a description of Florida, its state merit-based aid program, and its appropriateness for this analysis. Then the IPEDS dataset and other supplemental data sources are presented. Following these descriptions, components of the economic model are outlined and the variables included in the model are defined. The statistical techniques used to address the research questions are also described, followed by a description of the limitations of this study.

Florida and the Bright Futures Merit-Based Aid Program

In this section background information on Florida and the Bright Futures program is provided. The appropriateness of Florida for this study is described, followed by contextual information on the state's tuition-setting approach and financial aid policies during the study period. Eligibility criteria and expenditures for the Bright Futures program are described.

Selection of Florida and State Context

Florida is an appropriate focus for this study because it introduced a merit-based aid program earlier than other southeastern states. One requirement for a natural

experimental study is a discrete shift in policy or introduction of a new policy that can be studied relative to a control group (Meyer, 1995). Florida and surrounding southeastern states with no merit-based aid programs provide the opportunity for a natural experiment. Also, because Bright Futures offers students the possibility of 75% to 100% of their tuition and fees being covered by the scholarship, it is more likely to influence a price-sensitive students' decision to attend college than a program that covers lower shares of the price (Ness & Tucker, 2005; Paulsen, 2001a).

Florida is the fourth most populous state with 17 million residents, and it has a large and diverse array of postsecondary institutions made up of 160 degree-granting institutions and approximately 760,000 students (National Center for Education Statistics [NCES], 2006). Despite its large number of institutions, Florida typically ranks below the national average in terms of baccalaureate attainment among those 25 years old and older compared with the rest of the United States (NCES, 2005). Florida is well known for having some of the lowest-priced public postsecondary institutions relative to the rest of the United States. However, in 2006 the National Center for Public Policy in Higher Education gives Florida an F in providing affordable higher education, largely because the state invests only 14% of its student financial aid in need-based programs.

The state political context relative to higher education slowly changed during the period covered in this study. Historically, the state's public institutions were organized within a relatively autonomous state university system that began as a Board of Regents arm of the state government (Finney, 1997). The Board was able to coordinate policies and set tuition rates. By the 1970s, the Board of Regents became a government unit reporting to the elected Commissioner of Education. Legislative authority over

institutions grew during the 1970s and into the 1980s, culminating in a state law in 1991 authorizing a tuition indexing policy, capping how much the Board of Regents could raise tuition and fees (Florida Statute 240.214 [5]). Although authority over price-setting did not significantly change before 2000, in 1998, Florida introduced a K-20 governance structure through a constitutional amendment (Florida Statute 240.297[8]). As a result of this shift, the Board of Regents was abolished and a Board of Trustees was established for each public four-year institution. Most of these substantive changes were not in effect until after the time period analyzed in this study. During the study period in public institutions tuition and fees were set by the Board of Regents in the January that preceded the academic year (Florida Statute 240.297[8]) whereas room and board charges and institutional grants were determined by private and for-profit institutions autonomously on their own schedules.

Description, Eligibility Criteria, and Expenditures of Bright Futures

The Bright Futures program is the largest financial aid program in Florida (Office of Program Policy Analysis and Government Accountability [OPPAGA], 2003). It was launched by the Florida Legislature in 1997 to:

> Establish a lottery-funded scholarship program to reward any Florida high school graduate who merits recognition of high academic achievement and who enrolls in an eligible Florida public or private postsecondary education institution within three years of graduation from high school. (Florida Statute 240.40201)

Because Bright Futures legislation explicitly mentions the goal of rewarding academic achievement, it implicitly establishes a goal of making college opportunities more

affordable. The Bright Futures Scholarship Program consists of three types of awards: the Florida Academic Scholarship (FAS), the Florida Medallion Scholarship (FMS), and the Florida Gold Seal Vocational Scholarship (GSV). For public sector recipients these awards cover 75% to 100% of tuition and fees and for private sector recipients these awards cover 75% to 100% of the average tuition and fees at comparable public institutions.

To be eligible for these awards a student must be a U.S. citizen or eligible noncitizen, be a recipient of a standard Florida high school diploma or its equivalent within three years of receiving the first award disbursement, not be guilty of a felony, not be in default on any federal Title IV loan or state loan, submit a Florida financial aid application, and attend a Florida-eligible institution for at least six credit hours. Table 3.1 lists the eligibility requirements for the three different awards. Each award requires that students meet a minimum grade point average (GPA) in core courses, a minimum test score on the Scholastic Aptitude Test (SAT) or American College Test (ACT), and for the FAS award, a minimum of 75 community service hours.

The Florida Department of Education administers Bright Futures, and the Education Enhancement Trust Fund allocates the funding for the scholarships. In the event that the funds appropriated to Bright Futures are not adequate to provide the maximum allowable award to each eligible applicant, awards in all three components of the program are prorated by equal percentage reduction (Florida statutes 1009.40-1009.96).

Table 3.1
Eligibility Requirements for Initial Bright Futures Awards for 2006 High School Applicants
(requirements that must be met prior to high school graduation from a Florida high school)

	Florida Academic Scholars Award (FAS)	Florida Medallion Scholars Award (FMS)	Florida Gold Seal Vocational Scholars Award (GSV)
Grade Point Average (GPA)	3.5 weighted GPA using the credits listed below, combined with the test scores and community service hours listed below	3.0 weighted GPA using the credits listed below, combined with the test scores listed below	3.0 weighted GPA using the 15.5 credits listed below for a 4-year diploma and a 3.5 unweighted GPA in a minimum of 3 vocational credits in one vocational program, combined with the scores listed below
Required Credits: A comprehensive course table on the Bright Future's website list courses that count toward each award level.	Courses must include 15 credits of college preparatory academic courses: 4 English (3 with substantial writing) 3 Mathematics (Algebra I and above) 3 Natural Science (2 with lab) 3 Social Science 2 Foreign Language (one language) May use up to 3 additional credits from courses in the academic areas listed above and/or AP, IB, or AICE fine arts courses to raise the GPA	Courses must include 15 credits of college preparatory academic courses: 4 English (with substantial writing) 3 Mathematics (Algebra I & above) 3 Natural Science (2 with lab) 3 Social Science 2 Foreign Language (one language) May use up to 3 additional credits from courses in the academic areas listed above and/or AP, IB, or AICE fine arts courses to raise the GPA	4-year Diploma Credits must include 15.5 core credits required for high school graduation: 4 English 3 Mathematics (including Algebra I) 3 Natural Science 3 Social Science (American and World History, Government, and Economics) 1 Practical Arts OR 1 Performing Arts OR one-half credit in each: Life Management Skills Personal Fitness Physical Education Plus a minimum of 3 Vocational Job-Preparatory or Technology Education Program credits

Source: Florida Bright Futures Scholarship Program Initial Eligibility Brochure, www.firn.edu/doe/brfutures/pdf/bf_brochure.pdf

Table 3.1 (Continued)
Eligibility Requirements for Initial Bright Futures Awards for 2006 High School Applicants
(requirements that must be met prior to high school graduation from a Florida high school)

	Florida Academic Scholars Award (FAS)	Florida Medallion Scholars Award (FMS)	Florida Gold Seal Vocational Scholars Award (GSV)
Community Service	75 hours, as approved by the district or private school	Not required	Not required
Test Scores	Best composite score of 1270 SAT Reasoning Test (based on the combined Critical Reading and Math sections only) or 28 ACT (excluding the writing section) The new writing sections for both the SAT and ACT are used in the composite. SAT Subject Tests are not used for Bright Future's eligibility. (ACT scores are rounded up for scores with .5 and higher; SAT scores do not require rounding.)	Best composite score of 970 SAT Reasoning Test (based on the combined Critical Reading and Math sections only) or 20 ACT (excluding the writing section) The new writing sections for both the SAT and ACT are used in the composite. SAT Subject Tests are not used for Bright Future's eligibility. (ACT scores are rounded up for scores with .5 and higher; SAT scores do not require rounding.)	Students must earn the minimum score on each section of the CPT or SAT or ACT. CPT: Reading=83; Sentence Skills=83; Algebra=72 or SAT Reasoning Test: Critical Reading=440; Math=440 or ACT: English=17; Reading=18; Math=19

Source: Florida Bright Futures Scholarship Program Initial Eligibility Brochure, www.firn.edu/doe/brfutures/pdf/bf_brochure.pdf

Table 3.1 (Continued)
Eligibility Requirements for Initial Bright Futures Awards for 2006 High School Applicants
(requirements that must be met prior to high school graduation from a Florida high school)

	Florida Academic Scholars Award (FAS)	Florida Medallion Scholars Award (FMS)	Florida Gold Seal Vocational Scholars Award (GSV)
Alternate Methods of Qualifying:	• National Merit or Achievement Scholars and Finalists • National Hispanic Scholars • IB Diploma Recipients • Students who have completed the IB Curriculum with best composite score of 1270 SAT or 28 ACT • AICE Diploma Recipients • Students who have completed the AICE Curriculum with best composite score of 1270 SAT or 28 ACT • Students who have attended a home education program with best composite score of 1270 SAT or 28 ACT • GED with best composite score of 1270 SAT or 28 ACT and a 3.5 weighted GPA in the above 15 required credits • Early Admissions with best composite score of 1270 SAT or 28 ACT and a 3.5 weighted GPA in curriculum courses completed • 3-year standard college preparatory program with best composite score of 1270 SAT or 28 ACT and a 3.5 weighted GPA in the above 15 required credits	• National Merit or Achievement Scholars and Finalists and National Hispanic Scholars who have not completed 75 hours of community service • Students who have completed the IB Curriculum with best composite score of 970 SAT or 20 ACT • Students who have completed the AICE Curriculum with best composite score of 970 SAT or 20 ACT • Students who have attended a home education program and have a best composite score of 1070 SAT or 23 ACT • GED with best composite score of 970 SAT or 20 ACT and a 3.0 weighted GPA in the above 15 required credits • Early Admissions with best composite score of 970 SAT or 20 ACT and a 3.0 weighted GPA in curriculum courses completed • 3-year standard college preparatory program with best composite score of 970 SAT or 20 ACT and a 3.0 weighted GPA in the above 15 required credits	Obtain a 3.5 unweighted GPA in a minimum of 3 vocational credits in one vocational program and minimum test scores listed above. • 3-year Career Preparatory Diploma with 3.0 weighted GPA using the 13 core credits required for graduation listed below: 4 English (3 with substantial writing) 3 Mathematics (including Algebra I) 3 Natural Science (2 with lab) 3 Social Science • 3-year College Preparatory Diploma with 3.0 weighted GPA using the 15 core credits required for graduation listed below: 4 English (3 with substantial writing) 3 Mathematics (Algebra I and above) 3 Natural Science (2 with lab) 3 Social Science 2 Foreign Language (in the same language) • GED with 3.0 weighted GPA using the core credits required for your selected high school graduation option (standard, career, or college)

Source: Florida Bright Futures Scholarship Program Initial Eligibility Brochure, www.firn.edu/doe/brfutures/pdf/bf_brochure.pdf

The total disbursements during the first academic year following the introduction of Bright Futures (1997-1998) totaled $69.6 million and rose to $174.9 million by 2001-2002, the fifth year of the program (OPPAGA, 2003). How the disbursement amounts vary for the three programs and the share of tuition and fees covered by the scholarship for students attending eligible institutions are shown in Table 3.2. The FAS recipients, those who meet the highest academic standards, receive a scholarship equal to 100% of tuition and fees in public institutions as well as $300 per semester for other college expenses. At private institutions, FAS recipients receive a scholarship equal to 100% of the price

Table 3.2
Florida Bright Futures Award Disbursement Rules

	Academic Scholars (FAS)	Medallion Scholars (FMS)	Vocational Scholars (GSV)
Public Institutions	100% of tuition and fees (including lab fees up to $300 per semester) plus $300 per semester for college related expenses (excluding summer term) prorated by term and hours	75% of tuition and fees (including lab fees up to $300 per semester)	75% of tuition and fees (including lab fees up to $300 per semester)
Private Institutions	100% of the average tuition and fees covered at a comparable Florida public institution including the $300 per semester provided for college-related expenses prorated by term and hours	75% of the average tuition and fees covered at a comparable Florida public institution prorated by term and hours	75% of the average tuition and fees covered at a comparable Florida public institution prorated by term and hours

Source: Florida Bright Futures Scholarship Program Initial Eligibility Brochure, www.firn.edu/doe/brfutures/pdf/bf_brochure.pdf

covered at a comparable public institution. The FMS recipients, who meet slightly less rigorous academic requirements, receive a scholarship equal to 75% of tuition and fees at public institutions. At private institutions, FMS recipients receive a scholarship equal to 75% of tuition and fees at a comparable public institution. The GSV recipients, who meet the least rigorous academic requirements, receive an amount equal to 75% of tuition and fees at public institutions and a comparable dollar amount at private institutions.

Students attending college part-time also qualify for the program but receive lower awards. A student enrolled in six to eight semester credit hours may receive as much as one-half of the maximum award, a student enrolled in 9 to 11 credit hours may receive as much as three-fourths of the maximum award, and a student enrolled in 12 or more credit hours may receive the full award. The Bright Futures program allows students to transfer within the state with their award, and students may apply for additional awards for summer terms within the annual maximum of 45 credit hours per student.

The 1997 legislation established the institutions that students may attend to qualify for the award (Florida State Law 240.40204). Eligible institutions are—(a) a Florida public university, community college, or technical center; (b) an independent Florida college or university that is accredited by a member of the Commission on Recognition of Postsecondary Accreditation and that has operated in the state for at least three years; (c) an independent Florida postsecondary education institution that is licensed by the State Board of Independent Colleges and Universities, is in sound

financial condition, and has operated in the state for at least three years without having its approval, accreditation, or license placed on probation; (d) a Florida independent postsecondary education institution that offers a nursing diploma approved by the Board of Nursing; or (e) a Florida institutions of independent postsecondary education that is licensed by the State Board of Independent Postsecondary Vocational, Technical, Trade, or Business Schools meeting the minimum program completion and placement rate required by a U.S. Department of Education recognized accrediting agency and has operated in Florida for five years in good standing.

Approximately 27% of all Florida high school graduates qualified for one of the three Bright Futures awards in 1997 when the program was introduced, and this percentage steadily increased to almost 40% in 2003 (Florida Department of Education, 2005). Table 3.3 shows participation in the program from its initial year to the 2004-2005 academic year. During the 1997-1998 academic year, 23,710 students received a Bright Futures scholarship for the first time, and an additional 18,609 students were grandfathered into the program from an existing state scholarship program.[1] According to OPPAGA (2003), approximately 71% of all the scholarship recipients attended public four-year institutions in 2000, 10% attended private four-year institutions, 19% attended public two-year institutions, and fewer than 1% attended for-profit institutions. Table 3.3 also shows differences in the distribution of recipients and dollars disbursed across the

[1] Before the launch of the Bright Futures program in 1997, two state scholarship programs were offered in Florida: the Florida Undergraduate Scholars Fund (FUSF) and the Vocational Gold Seal Endorsement Scholarship (VGSES). Compared with Bright Futures, these programs have far less generous scholarships, but similar merit-based criteria, including minimum GPA, test score, and course requirements. FUSF, capped at $2,500 annually, and VGSES, capped at $2,000 annually, were funded through state appropriations, whereas Bright Futures was tied to a percentage of public four-year and public two-year prices. After 1997, FUSF and VGSES students were moved into the new Bright Futures program, funded through the state lottery and set as a percentage of tuition and fees (Florida Department of Education, 1996).

three programs. For example, in 2004-2005 there were 27,472 FAS recipients, representing just 21% of total recipients, but 33% of total disbursed dollars went to

Table 3.3
Bright Futures Scholarship, Number of Initial, Renewal and Total Recipients and Dollars Dispersed 1997-98 to 2003-04

	Academic Scholars (FAS)	Medallion Scholars (FMS)	Vocational Scholars (GSV)	Combined
Initial Recipients				
1997-98	7,011	9,861	6,838	23,710
1998-99	7,453	15,576	2,314	25,343
1999-00	7,926	18,201	2,402	28,529
2000-01	6,031	24,184	2,040	32,255
2001-02	6,345	25,495	1,210	33,050
2002-03	7,064	28,447	1,323	36,834
2003-04	7,705	30,812	1,404	39,921
2004-05	8,560	32,967	1,467	42,994
Renewal Recipients				
1997-98	11,608	3,174	3,827	18,609
1998-99	14,132	9,569	7,021	30,722
1999-00	16,348	22,221	3,907	42,476
2000-01	18,443	34,296	2,062	54,801
2001-02	18,390	45,078	1,776	65,244
2002-03	18,055	53,676	1,303	73,034
2003-04	18,091	61,430	1,195	80,716
2004-05	18,912	67,543	1,148	87,603
Total Recipients				
1997-98	18,619	13,035	10,665	42,319
1998-99	21,585	25,145	9,335	56,065
1999-00	24,274	40,422	6,309	71,005
2000-01	24,474	58,480	4,102	87,056
2001-02	24,735	70,573	2,986	98,294
2002-03	25,119	82,123	2,626	109,868
2003-04	25,796	92,242	2,599	120,637
2004-05	27,472	100,510	2,615	130,597

Source: Office of Student Financial Assistance, Annual Report to the Commissioner, 2004-05

Table 3.3 (Continued)
Bright Futures Scholarship, Number of Initial, Renewal and Total Recipients and Dollars Dispersed 1997-98 to 2003-04

	Academic Scholars (FAS)	Medallion Scholars (FMS)	Vocational Scholars (GSV)	Combined
Dollars Dispersed				
1997-98	$43,892,936	$15,242,245	$10,431,788	$69,566,969
1998-99	$52,130,071	$31,153,146	$10,049,353	$93,332,570
1999-00	$65,605,340	$58,656,888	$7,588,704	$131,850,932
2000-01	$69,142,925	$90,574,018	$5,052,404	$164,769,347
2001-02	$67,628,272	$103,792,891	$3,493,754	$174,914,917
2002-03	$71,584,097	$127,378,680	$3,242,029	$202,204,806
2003-04	$78,499,060	$153,278,582	$3,411,112	$235,188,754
2004-05	$89,018,077	$176,316,888	$3,609,404	$268,944,369

Source: Office of Student Financial Assistance, Annual Report to the Commissioner, 2004-05

FAS ($89 million). In contrast, FMS represented 77% of total recipients but only 66% of total dollars ($176 million). In other words, expenditures per student are higher for FAS than FMS because of the differences in awards and the prices of institutions attended. FAS pays out an amount equal to 100% of tuition and fees at public institutions and a comparable dollar amount for private institutions plus stipends, and students who receive FAS predominantly attend four-year institutions that have higher tuition and fees than public two-year colleges. In contrast, FMS recipients receive scholarships equal to 75% of the costs of tuition and fees, and a larger share of the FMS recipients attend public two-year institutions. Table 3.4 also shows that the number of recipients and the amount of spending on both the FAS and the FMS programs steadily increased between 1997-1998 and 2004-2005 but declined in the GSV category.

Data

In this study Bright Futures Scholarship data from the Florida Department of Education and enrollment and finance data from the Integrated Postsecondary Student Education Data System (IPEDS) are used. These sources are supplemented with data that describe state characteristics from the Current Population Survey and the *Digest of Education Statistics.* In this section the two primary data sources, the sample of institutions from those data sources, and imputation methods used in IPEDS and in this study are described.

Table 3.4

Bright Futures Awards by Institutional Sector, Average Institutional Disbursements, and State Disbursements in Constant (2006) Dollars

	Institutional Average		State Total	
	Awardees	Amount	Awardees	Amount
1997				
Public Four-Year				
FMS	927	$1,181,170	8,343	$10,630,529
GSV	448	$578,562	4,033	$5,207,061
FAS/ATS/TOPS	1,637	$3,861,645	14,733	$34,754,805
Total	3,012	$5,621,377	27,109	$50,592,395
Private Four-Year				
FMS	49	$71,315	1,384	$1,996,833
GSV	20	$28,986	561	$811,597
FAS/ATS/TOPS	100	$260,734	2,507	$6,518,359
Total	148	$310,893	4,452	$9,326,789
For-Profit				
FMS	3	$2,936	26	$23,487
GSV	9	$8,986	96	$98,849
FAS/ATS/TOPS	2	$3,683	7	$11,049
Total	11	$11,115	129	$133,385
Public Two-Year				
FMS	114	$80,041	3,526	$2,481,282
GSV	146	$100,623	6,001	$4,125,551
FAS/ATS/TOPS	56	$88,747	1,561	$2,484,909
Total	270	$221,750	11,088	$9,091,742

Note: Academic Top Scholarships (ATS) and its predecessor TOPS are two supplemental grants only available to FAS recipients. The number of awardees are unduplicated counts of recipients.

Source: Bright Futures Scholarship Office, Florida Department of Education.

Table 3.4 (Continued)
Bright Futures Awards by Institutional Sector, Average Institutional Disbursements, and State Disbursements in Constant (2006) Dollars

	Institutional Average		State Total	
	Awardees	Amount	Awardees	Amount
1998				
Public Four-Year				
FMS	1,791	$2,382,871	16,120	$21,445,843
GSV	468	$617,344	4,212	$5,556,099
FAS/ATS/TOPS	1,949	$4,696,902	17,542	$42,272,116
Total	4,208	$7,697,118	37,874	$69,274,058
Private Four-Year				
FMS	82	$125,312	2,619	$4,009,999
GSV	17	$25,924	554	$829,567
FAS/ATS/TOPS	101	$269,716	2,716	$7,282,320
Total	178	$367,330	5,889	$12,121,886
For-Profit				
FMS	7	$7,603	66	$76,028
GSV	6	$6,471	72	$77,655
FAS/ATS/TOPS	3	$5,518	17	$27,591
Total	12	$13,944	155	$181,274
Public Two-Year				
FMS	181	$144,873	6,714	$5,360,301
GSV	119	$87,696	4,628	$3,420,152
FAS/ATS/TOPS	51	$80,081	1,472	$2,322,351
Total	329	$284,687	12,814	$11,102,804

Note: Academic Top Scholarships (ATS) and its predecessor TOPS are two supplemental grants only available to FAS recipients. The number of awardees are unduplicated counts of recipients.

Source: Bright Futures Scholarship Office, Florida Department of Education.

Table 3.4 (Continued)
Bright Futures Awards by Institutional Sector, Average Institutional Disbursements, and State Disbursements in Constant (2006) Dollars

	Institutional Average		State Total	
	Awardees	Amount	Awardees	Amount
1999				
Public Four-Year				
FMS	3,009	$4,739,717	27,078	$42,657,449
GSV	305	$467,582	2,749	$4,208,240
FAS/ATS/TOPS	2,230	$6,068,285	20,071	$54,614,562
Total	5,544	$11,275,583	49,898	$101,480,251
Private Four-Year				
FMS	127	$207,149	4,077	$6,628,762
GSV	10	$15,204	276	$425,717
FAS/ATS/TOPS	103	$284,409	2,873	$7,963,442
Total	226	$469,310	7,226	$15,017,921
For-Profit				
FMS	8	$12,204	85	$134,244
GSV	5	$7,263	50	$72,629
FAS/ATS/TOPS	3	$6,138	15	$36,827
Total	11	$17,407	150	$243,700
Public Two-Year				
FMS	269	$229,717	9,947	$8,499,528
GSV	89	$70,770	3,371	$2,689,244
FAS/ATS/TOPS	53	$88,145	1,528	$2,556,216
Total	371	$343,625	14,846	$13,744,988

Note: Academic Top Scholarships (ATS) and its predecessor TOPS are two supplemental grants only available to FAS recipients. The number of awardees are unduplicated counts of recipients.

Source: Bright Futures Scholarship Office, Florida Department of Education.

Table 3.4 (Continued)
Bright Futures Awards by Institutional Sector, Average Institutional Disbursements, and State Disbursements in Constant (2006) Dollars

	Institutional Average		State Total	
	Awardees	Amount	Awardees	Amount
2000				
Public Four-Year				
FMS	4,555	$7,403,207	40,999	$66,628,860
GSV	161	$258,384	1,449	$2,325,458
FAS/ATS/TOPS	2,322	$6,423,057	20,902	$57,807,509
Total	7,039	$14,084,647	63,350	$126,761,827
Private Four-Year				
FMS	180	$317,875	5,756	$10,172,008
GSV	7	$12,235	193	$330,340
FAS/ATS/TOPS	98	$287,815	2,845	$8,346,634
Total	275	$589,031	8,794	$18,848,982
For-Profit				
FMS	11	$18,977	154	$265,680
GSV	3	$3,824	39	$53,534
FAS/ATS/TOPS	3	$7,915	14	$39,577
Total	12	$19,933	207	$358,791
Public Two-Year				
FMS	353	$296,032	12,364	$10,361,111
GSV	64	$55,189	2,499	$2,152,386
FAS/ATS/TOPS	59	$81,661	1,757	$2,449,825
Total	396	$356,270	16,620	$14,963,322

Note: Academic Top Scholarships (ATS) and its predecessor TOPS are two supplemental grants only available to FAS recipients. The number of awardees are unduplicated counts of recipients.

Source: Bright Futures Scholarship Office, Florida Department of Education.

Florida Bright Futures Data

One source of data for this study is the Florida Bright Futures program. The Office of Student Financial Assistance within the Florida Department of Education gathers data on all scholarships dispersed to Florida residents through the Bright Futures program. In this study I use information about the number of Bright Futures recipients at each institution (initial and renewal) and the dollar amount received for each recipient at each institution (initial and renewal) for selected years after the program's introduction (1997-1998 to 2000-2001). The student-level data are aggregated to create institution-level data about the disbursements and number of recipients for Bright Futures. To gain access to the Florida data, I submitted a request to the Bright Futures program director that included a description of the study. I received institution-level data for all four years with the number of recipients and the dollar amount for every eligible Florida institution.

Table 3.4 shows the breakdown of recipients and dollars by sector for Florida institutions included in the sample from 1997-1998 to 2000-2001. The largest number of awardees and the amount of money spent for Bright Futures were concentrated in the public four-year sector in all years, followed by the public two-year sector and the private four-year sector. For-profit institutions had a maximum of 12 awardees on average in a given year. The largest Bright Futures program in 1997 was FAS (with the more academically rigorous criteria), but in 1998 through 2000, FMS (with average academic requirements) grew to be the largest program across all sectors combined.

Integrated Postsecondary Student Education Data System

A second source of data for this study is IPEDS. The U.S. Department of Education's NCES originally launched IPEDS in 1986 to replace the Higher Education General Information Survey as a means of collecting data from all postsecondary institutions. In 1992, this data collection effort was limited to institutions that participated in federal Title IV financial aid programs. IPEDS is conducted by NCES to fulfill its legislative mandate to collect and disseminate information about U.S. postsecondary education. Participation in the survey is mandatory for all institutions that participate in any federal financial aid assistance program authorized by Title IV of the Higher Education Act of 1965, as amended (20 U.S.C. 1094[a][17]). IPEDS data collection focuses on nine areas: institutional characteristics, completions, employees, salaries, fall staff, enrollment, student financial aid, finance, and graduation rates. Fall staff data are collected biannually, and the other categories are collected annually in the fall, winter, and spring. The IPEDS data for this study are publicly available on the NCES Data Cutting Tool website for 1993-1998 and 2000. For financial surveys in 1996 and 1997, and for all the surveys in 1999, data are available with a password provided by NCES.

NCES collects institution-level data for IPEDS from all Title IV postsecondary institutions in all 50 states and the District of Columbia as well as parts of Puerto Rico. IPEDS institutions include: (a) all institutions whose primary purpose is the provision of postsecondary education; (b) all branches of colleges, universities, and other institutions as long as the branch offers a full program of study; (c) free-standing medical schools as well as schools of nursing, schools of radiology, and others within hospitals; and (d) schools offering occupational and vocational training to prepare students for work

(Jackson et al., 2005). IPEDS does not include (a) schools not open to the general public (e.g., training sites at prisons, military installations, corporations); (b) hospitals offering only internships or residency programs or hospitals that offer only training as part of a medical school program at an institution of higher education; (c) organizational entities providing only noncredit continuing education; (d) schools whose only purpose is to prepare students to take a particular test, such as the Certified Public Accountant examination or bar exams; and (e) branch campuses of U.S. institutions in foreign countries (Jackson et al., 2005).

Although today IPEDS is completely web-based, before 2000 all institutions received the survey form by mail in July preceding the academic year for which the survey was based. Institutions received one of four versions of the survey depending on their control, program offerings, and eligibility for federal financial aid. Eligible institutions included those identified by the U.S. Department of Education and those identified by institutional self-identification. Beginning in 1996-1997 the list of eligible institutions was validated by matching the IPEDS universe with the Office of Postsecondary Education's Postsecondary Education Participation System file, a file that is used to determine whether an institution is eligible to participate in Title IV federal financial aid programs (NCES, 1997a). Institutions are to complete and return questionnaires before September 1, and NCES conducts extensive follow-up for survey nonrespondents through April of the following academic year. Critical missing data, including tuition, fees, room and board, and enrollment, are collected from the institutions through an abbreviated telephone survey interview (NCES, 1997a).

In 2000, NCES staff redesigned IPEDS to improve its technology and data collection procedures, and to adapt to changes in postsecondary education. Also, in 2000 the IPEDS survey became completely web-based. These changes respond, at least in part, to a number of quality issues with data collected before 2000. Some of these data quality issues include inconsistency in data definitions used in IPEDS compared with other federal and nonfederal surveys (which led to different data definition interpretations among institutional respondents), inaccurate institutional reporting with limited opportunities for institutional revisions to previous data responses, and inadequate processes for checking the reliability and validity of survey responses (Jackson et al., 2005).

Between 1993 through 2000, three surveys were collected that are relevant to this study: Institutional Characteristics (IC), Fall Enrollment, and Institutional Finance. The IC survey is central to IPEDS data collection because it forms the sampling frame from which all other NCES surveys of postsecondary institutions are conducted. Data elements in the annual IC survey include information such as institution address, tuition and required fees, room and board charges, control or affiliation, type of calendar system, levels of awards offered, types of programs, and accreditation.

The Fall Enrollment survey is administered to the same group of institutions included in the IC survey. The survey collects data on students enrolled in courses creditable toward a degree or other formal award and in courses that are part of a vocational or occupational program, including those enrolled in off-campus centers and high school students taking regular college courses for credit. The Fall Enrollment survey excludes students who are enrolled exclusively in courses not creditable toward a formal

award, a postsecondary vocational program, and remedial courses, as well as students exclusively auditing classes, studying abroad if their enrollment at the institution is only an administrative record and the fee is only nominal, attending any branch campus located in a foreign country, and earning continuing education units only.

There are two primary versions and one consolidated version of the Fall Enrollment survey. Institutions receive one of the three versions based on institution type. The most extensive primary version is sent to all four-year institutions. The other, less-detailed primary version is sent to two-year postsecondary institutions that grant only an associate's degree. Additional enrollment data are collected with a third consolidated version of the survey that is sent to two-year institutions that grant awards or certificates of at least two- but less-than-four academic years (nondegree granting) and less-than-two-year institutions that offer awards or certificates of less-than-two-year duration. The enrollment data collected by the surveys are integrated into the Fall Enrollment database. The extensive primary version collects from four-year institutions the number of students by attendance status (full-time or part-time), student level (undergraduate, first professional, graduate), race/ethnicity and sex, degree-seeking status, major field of study (even numbered years only), year of study, age (odd numbered years only), and residence of first-time students (even numbered years only). The less detailed primary version for two-year institutions omits student level (undergraduate, first professional, graduate) and major field of study. The consolidated version further collects data from all other institutions on the number of students by attendance status, race/ethnicity and sex, and year of study. Survey forms for the Fall Enrollment survey are sent to institutions in the July before the fall academic semester and are due in mid-November. Extensive follow

up for nonresponse occurs between November and April. All data submitted are extensively edited and reviewed. NCES survey staff checks all enrollment data to determine internal and interyear consistency (NCES, 1997b).

The Institutional Finance survey is distributed to the same group of institutions included in the IC survey. Data elements include current fund revenues by source (e.g., tuition and fees, government aid, and private gifts), current fund expenditures by function (e.g., instruction, research, plant maintenance, and operation), physical plant assets and indebtedness, and endowment investments. From 1993 to 1995, finance data were collected in a single survey for all institutions. Beginning in 1996 with the introduction of standards of federal accounting reporting, the finance survey varied slightly based on institutional control. For public institutions, data are collected on current funds revenues by source, current funds expenditures by function, scholarship and fellowship expenditures, indebtedness on physical plants, details of endowment assets, hospital revenues, and physical plant assets. Additionally, certain data are collected for the U.S. Bureau of the Census, including fiscal year interest earnings and cash and security, fiscal year tax receipts and capital outlay expenditures, and fiscal year revenue, expenditure, and indebtedness. For private not-for-profit institutions, data are collected on statement of financial position, changes in net assets, student grants, revenues and investment return, and expenses by functional classification. For private for-profit institutions, data are collected on balance sheet information, changes in equity, student grants, revenues and investment return, and expenses by function (NCES, 2000).

Student financial aid information is based on the full academic year and collected in two parts: number of aid recipients and financial aid dollar amounts. Data on the

number of aid recipients are collected by characteristics such as whether the student is in-district, in-state, or out-of-state; a first-time college student; or an undergraduate seeking a full-time degree/certificate. For each type of aid, the survey collects the average amount of aid received by those students for the entire academic year. The survey includes data on federal grants (grants/educational assistance funds), state and local grants (grants/scholarships/waivers), institutional grants (scholarships/fellowships), and loans to students (NCES, 2000).

The three IPEDS surveys described in this section contain several variables relevant to this study, such as college enrollment, student financial aid expenditures, tuition and fee charges, and room and board rates. Because institutions are required by law to participate in the survey for their students to receive Title IV federal financial aid (P. L. 102-325), IPEDS has a high response rate. Table 3.5 shows the annual response rates for the IPEDS institutions selected for this study. In several years, the selected institutions had a 100% response to all the surveys. The lowest response rate to the IC survey occurred in the for-profit sector (97.3%) in 1998 and 1999. The lowest response rate to the Fall Enrollment survey occurred in the private four-year sector in 2000 (73.5%). The lowest response rate in the finance survey occurred in the public two-year sector in 1996 (88.4%). Although not without limitations, the generally high response rates to the main IC survey makes IPEDS the most commonly used and most reliable dataset available for studying U.S. institutions across multiple years and states.

Table 3.5
Percentage of Institutions with Responses to IPEDS Surveys by Year

	Percentage of Respondents		
	Institutional Characteristics Survey	Enrollment Survey	Finance Survey
Public Four-Year (n = 474)			
1993	100.0%	99.8%	99.8%
1994	100.0%	100.0%	100.0%
1995	100.0%	100.0%	100.0%
1996	100.0%	100.0%	98.9%
1997	100.0%	100.0%	99.2%
1998	99.4%	100.0%	100.0%
1999	99.6%	99.4%	98.9%
2000	100.0%	87.3%	100.0%
Private Four-Year (n = 893)			
1993	99.9%	99.7%	98.0%
1994	100.0%	100.0%	98.1%
1995	100.0%	100.0%	98.2%
1996	100.0%	99.7%	89.6%
1997	100.0%	99.2%	90.0%
1998	99.0%	100.0%	98.8%
1999	99.2%	98.5%	96.1%
2000	100.0%	73.5%	99.9%
For Profit (n = 1,005)			
1993	99.5%	96.0%	
1994	100.0%	99.7%	
1995	100.0%	100.0%	
1996	100.0%	96.9%	
1997	100.0%	98.5%	
1998	97.3%	99.9%	
1999	97.3%	95.5%	
2000	100.0%	91.1%	
Public TwoYear (n = 837)			
1993	100.0%	99.8%	90.4%
1994	100.0%	100.0%	92.1%
1995	100.0%	100.0%	92.2%
1996	100.0%	99.8%	88.4%
1997	100.0%	99.8%	90.3%
1998	99.3%	100.0%	99.5%
1999	99.2%	99.4%	97.3%
2000	100.0%	99.4%	100.0%

Note: Finance survey was not used for analyses of institutions in the for-profit sector.

Source: Analyses of IPEDS 1993-2000

Sample

The sample selected for this study includes postsecondary institutions from 1993-1994 through 2000-2001. The eight-year period provides four years of observation of Florida institutions before the implementation of the Florida Bright Futures program and four years after implementation. Two control groups are used for comparison with Florida. The primary control group consists of 397 institutions in eight years from seven southeastern states: Alabama (n = 43), Delaware (n = 12), Maryland (n = 63), North Carolina (n = 104), Tennessee (n = 65), Virginia (n = 81), and West Virginia (n = 29). These states exclude the five southeastern states that introduced merit-based aid programs during the study period: Georgia, Kentucky, Louisiana, Mississippi, and South Carolina. Institutions in the entire United States that did not introduce state merit-based aid programs during the study period are used as the second control group (n = 2,654) to test for the robustness of regression results. The institutions selected for analysis represent four sectors of postsecondary education including public four-year, private four-year, public two-year, and for-profit institutions. However, for-profit institutions are discussed only in the descriptive analyses, because data from the Bright Futures program indicate that scholarship recipients made up less than one percent of students at these institutions.

To select the sample of IPEDS institutions for this study, I applied several criteria from the IC Survey from 1993 through 2000 (e.g., eight years of data, 39,832 institution observations). Table 3.6 shows the number of institutions for each year and sector for the two phases of selection used to create the sample institution list. First, I selected institutions that were Title IV eligible, open to the general public (e.g., not a military institution), serving undergraduates (e.g., not exclusively a graduate or professional

Table 3.6
Number of Institutions by Sector and Year, After Applying Criteria Used to Select Sample of IPEDS Institutions

	1993	1994	1995	1996	1997	1998	1999	2000	Total
PHASE I[a]									
Public Four-Year	573	573	575	576	581	585	584	586	4,633
Private Four-Year	1,188	1,192	1,197	1,204	1,212	1,216	1,205	1,228	9,642
For-Profit	1,530	1,520	1,513	1,320	1,320	1,304	1,290	1,327	11,124
Public Two-Year	1,227	1,235	1,239	1,442	1,425	1,434	1,433	1,421	10,856
Other	461	459	455	437	441	440	420	417	3,530
Unassigned	-	-	-	-	-	-	47	-	47
Total	4,979	4,979	4,979	4,979	4,979	4,979	4,979	4,979	39,832
PHASE II[b]									
Public Four-Year	474	474	474	474	474	474	474	474	3,792
Private Four-Year	893	893	893	893	893	893	893	893	7,144
For-Profit	1,005	1,005	1,005	1,005	1,005	1,005	1,005	1,005	8,040
Public Two-Year	837	837	837	837	837	837	837	837	6,696
Total	3,209	3,209	3,209	3,209	3,209	3,209	3,209	3,209	25,672

[a]Sample Criteria for Phase I: Title IV eligible, open to the public, serving undergraduates, and not a subsidiary.
[b]Additional Sample Criteria for Phase II: Remained within the same sector all years, classification for state and region remained the same for all years, not a Florida competitor, and not in a state that introduced a merit-based aid program before or during the study period.

Source: Analyses of IPEDS 1993-2000

institution), and not a subsidiary to another institution in their survey response (e.g., not classified as a "child" institution in any part of the IPEDS survey). Second, I selected only institutions that were consistently assigned by NCES to the same sector and state and that were active (e.g., did not cease operations) for each of the eight years. Institutions were excluded if they were a Florida competitor (defined as having 5% or more Florida residents in the first-year class) and if they were in a state that introduced a merit-based aid program before or during the study period. The final IPEDS study sample has 3,209 institutions and 25,672 observations in eight years. The final analytical sample

for the study is further limited by missing data for the dependent variable. The extent to which missing data results in a biased sample is discussed below.

Table 3.7 shows the number of institutions in the IPEDS sample by sector, region, and state. The largest share of institutions are for-profit institutions (31.3%), followed by private four-year institutions (27.8%), public two-year institutions (26.1%), and public four-year institutions (14.8%). In terms of geographic region, the largest share of institutions is concentrated in the Mid-Atlantic (21.2%) followed by the Southeast with 18.2% of the total sample of institutions. The regional comparison group of states selected for this study are all in the Southeast and Mid-Atlantic regions. Florida has the seventh highest number of postsecondary institutions with 4.9% of the sample institutions (Florida, n = 158). Only Ohio, Illinois, Texas, Pennsylvania, New York, and California have more institutions. In Appendix A the Florida institutions included in the selected IPEDS sample are listed.

Table 3.8 shows the Carnegie classifications of the four-year institutions in the sample. The majority of the four-year public institutions are Master's Universities and Colleges I, making up 41.8% of the sample of public four-year institutions, followed by Baccalaureate Colleges II (16.2%) and Research Universities I (10.5%). The majority of private four-year institutions are Baccalaureate Colleges II, making up 29.5% of the private four-year institutions, followed by Master's Universities and Colleges I (17.4%) and Baccalaureate Colleges I (14.0%).

Table 3.7
Number and Distribution of Institutions in the Sample by Sector, Region, and State

	Number of Institutions	Number of Observations	Percentage
Sector			
Public Four-Year	474	3,792	14.8%
Private Four-Year	893	7,144	27.8%
For-Profit	1,005	8,040	31.3%
Public Two-Year	837	6,696	26.1%
Total	3,209	25,672	100.0%
Region			
New England	250	2,000	7.8%
Mid-Atlantic	681	5,448	21.2%
Great Lakes	468	3,744	14.6%
Plains	271	2,168	8.4%
Southeast	584	4,672	18.2%
Southwest	368	2,944	11.5%
Rocky Mountains	124	992	3.9%
Far West	463	3,704	14.4%
Total	3,209	25,672	100.0%

Note: Sample excludes Florida competitor institutions and institutions from states that introduced a merit-based aid program before or during the study period.

Source: Analyses of IPEDS 1993-2000

Table 3.7 (Continued)
Number and Distribution of Institutions in the Sample by Sector, Region, and State

	Number of Institutions	Number of Observations	Percentage
State			
Alabama	43	344	1.3%
Arkansas	55	440	1.7%
Arizona	64	512	2.0%
California	325	2,600	10.1%
Colorado	65	520	2.0%
Connecticut	52	416	1.6%
District of Columbia	12	96	0.4%
Delaware	12	96	0.4%
Florida	158	1,264	4.9%
Hawaii	16	128	0.5%
Iowa	51	408	1.6%
Idaho	10	80	0.3%
Illinois	165	1,320	5.1%
Indiana	90	720	2.8%
Kansas	63	504	2.0%
Massachusetts	108	864	3.4%
Maryland	63	504	2.0%
Maine	31	248	1.0%
Minnesota	86	688	2.7%
Montana	21	168	0.7%
North Carolina	104	832	3.2%
North Dakota	19	152	0.6%
Nebraska	32	256	1.0%
New Hampshire	26	208	0.8%
New Jersey	90	720	2.8%
New York	252	2,016	7.9%
Ohio	159	1,272	5.0%
Oklahoma	68	544	2.1%
Oregon	46	368	1.4%
Pennsylvania	252	2,016	7.9%
Rhode Island	16	128	0.5%
South Carolina	49	392	1.5%
South Dakota	20	160	0.6%
Tennessee	65	520	2.0%
Texas	236	1,888	7.4%
Utah	19	152	0.6%
Virginia	81	648	2.5%
Vermont	17	136	0.5%
Washington	76	608	2.4%
Wisconsin	54	432	1.7%
West Virginia	29	232	0.9%
Wyoming	9	72	0.3%
Total	3,209	25,672	100.0%

Note: Sample excludes Florida competitor institutions and institutions from states that introduced a merit-based aid program before or during the study period.
Source: Analyses of IPEDS 1993-2000

Table 3.8.
Number and Distribution of Institutions in the Sample by Carnegie Classification

	Public Four-Year		Private Four-Year	
	N	Percentage	N	Percentage
Research universities I	50	10.5%	24	2.7%
Research universities II	23	4.9%	9	1.0%
Doctoral universities I	21	4.4%	18	2.0%
Doctoral universities II	30	6.3%	20	2.2%
Masters (comprehensive) universities and colleges I	198	41.8%	155	17.4%
Masters (comprehensive) universities and colleges II	17	3.6%	50	5.6%
Baccalaureate (liberal arts) colleges I	10	2.1%	125	14.0%
Baccalaureate colleges II	77	16.2%	263	29.5%
Associate of arts colleges	18	3.8%	12	1.3%
Theological seminaries, Bible colleges and other institution	0	0.0%	100	11.2%
Medical schools and medical centers	17	3.6%	6	0.7%
Other separate health profession schools	0	0.0%	18	2.0%
Schools of engineering and technology	4	0.8%	8	0.9%
Schools of business and management	0	0.0%	28	3.1%
Schools of art, music, and design	2	0.4%	32	3.6%
Teachers colleges	0	0.0%	2	0.2%
Other specialized institutions	5	1.1%	6	0.7%
Tribal colleges	2	0.4%	1	0.1%
Total	474	100.0%	893	100.0%

Note: Carnegie classifications are only used for analyses of the four-year sectors, because the majority of public two-year and for-profit institutions are unclassified.

Source: Analyses of IPEDS 1993-2000

Imputation of Variables

The extent to which IPEDS consistently represents the entire population of U.S. institutions over time makes the data useful for building a well-constructed panel of institutions. NCES annually reviews IPEDS survey data to address the problem of missing or inconsistent data with imputations. NCES uses at least three methods to impute missing data in the finance components of the survey. In cases in which data are available from the previous year, data are carried forward to the current survey year and adjusted for inflation. For some variables deemed proportional to enrollment such as total

tuition and fees or total student grants, information is carried forward to the current survey year by an enrollment ratio to adjust for year-to-year change. In cases in which data are unavailable from the previous year, a sample of three comparable institutions is used to estimate data for variables such as total current funds revenue, scholarships, and fellowships expenditures and total current fund expenditures. Additionally, missing data are sometimes imputed by ranking a group of institutions and assigning a calculated median value to an institution (NCES, 2000). The careful procedures used by NCES in imputing missing or inconsistent data makes IPEDS a useful dataset for a study that is based on a panel of data of eight years. Without these imputation activities, missing data would make it necessary to drop many institutions from the analytic sample, thereby reducing the validity of the results.

Although NCES uses a review process to impute missing or inconsistent data, there are still some inconsistencies year-to-year in IPEDS data. For the 1996 and 1997 finance surveys, and all the surveys from 1999, NCES did not impute missing data. To reduce the effect of missing data on this study's analytical sample, I imputed values for enrollment and appropriations variables in this study. I imputed only data for institutions that have at least seven years of available data for tuition and fees and enrollment (to calculate full-time equivalent [FTE]). No imputation methods were used for the dependent variables. However, I imputed data for the following variables in Table 3.9: full-time enrollment, part-time enrollment, and state and local appropriations. I imputed the enrollment variables to calculate FTE enrollment and grant aid per FTE. I imputed appropriations to have a consistent independent variable that controls for direct state and local subsidies to institutions. Missing values were imputed only if at least four of the

eight years of data were available for the appropriations variable and five years of data were available for the enrollment variable.

To impute a given variable, I first identified the mean of the nearest available year before and after the missing year. In some cases, when two nearest-year values were unavailable because the missing value occurred at the end or at the beginning of the sample period, a second imputation step used a simple linear trend to establish the imputed value. Table 3.9 shows

Table 3.9
Percentage of Cases Imputed by Sector for Enrollment and State Appropriations

Variables	Public Four-Year	Private Four-Year	For-Profit	Public Two-Year
Full-time enrollment				
No full-time enrollment	0.0%	0.0%	0.6%	0.0%
Cases imputed three years	0.0%	0.1%	1.4%	0.0%
Cases imputed two years	0.0%	0.7%	2.4%	0.6%
Cases imputed one year	0.5%	7.8%	11.1%	1.2%
Cases with no imputation	99.5%	91.4%	84.5%	98.3%
Total	100.0%	100.0%	100.0%	100.0%
Part-time enrollment				
No part-time enrollment	0.4%	5.7%	44.6%	1.6%
Cases imputed three years	0.2%	0.5%	4.6%	0.0%
Cases imputed two years	0.0%	1.3%	6.0%	0.9%
Cases imputed one year	1.1%	5.5%	12.9%	2.2%
Cases with no imputation	98.4%	87.0%	31.9%	95.3%
Total	100.0%	100.0%	100.0%	100.0%
Appropriations (state appropriations and local appropriations for public two-year)				
No state appropriations	1.8%	87.6%		3.7%
Cases imputed four years	0.0%	0.0%		9.3%
Cases imputed three years	0.0%	1.7%		4.7%
Cases imputed two years	0.2%	3.0%		20.1%
Cases imputed one year	4.0%	2.0%		9.2%
Cases with no imputation	94.0%	5.6%		53.0%
Total	100.0%	100.0%		100.0%

Note: Sample excludes Florida competitor institutions and institutions from states that introduced a merit-based aid program before or during the study period.

Source: Analyses of IPEDS 1993-2000

that the majority of imputations occurred for full-time enrollment in the for-profit sector in which only 85.1% of the cases required no imputation (compared with 99.5% in the public four-year sector, 91.4% in the private four-year sector, and 98.3% in the public two-year sector). The majority of imputations occurred for part-time enrollment again in the for-profit sector in which only 76.5% of the cases required no imputation (compared with 98.8% in the public four-year sector, 92.7% in the private four-year sector, and 96.9% in the public two-year sector). For state and local appropriations, occurrences of missing data were most prevalent in the public two-year sector (56.7% required no imputation), compared with 95.8% in the public four-year sector and 93.2% in the private four-year sector that required no imputation. State and local appropriations were not included in analyses of the for-profit sector.

Statistical Model and Methodology

This study evaluates the effect of the state merit-based aid program in Florida on institutional tuition and fees, room and board charges and institutional aid expenditures. This study extends two lines of research: one that analyzes institutional price response to aid subsidies and a second that examines the effect of state merit-based aid programs on student and institutional outcomes. Utilizing an economic model of student and postsecondary institutional behavior, and data for the 1993-1994 to 2000-2001 academic years from IPEDS and the Florida Bright Futures program, this study evaluates a set of research questions about institutional response by sector.

Two comparison groups are used in the analyses: southeastern states that did not introduce a merit-based aid program before or during the study period and all of the states that did not introduce a merit-based aid program before or during the study period. Tuition and fees are analyzed for institutions in four sectors: public four-year, private four-year, public two-year, and for-profit. Room and board and charges are measured only in the four-year sectors that more commonly offer room and board. Grant aid expenditures are measured only at four-year private institutions, the sector that more commonly offers institutional grants. Grant aid expenditures in public four-year institutions could not be analyzed because of the small sample sizes.

Research Question One

How do the levels of tuition and fee charges, room and board charges, and grant aid expenditures at Florida colleges and universities compare with the levels at institutions in other states?

To address the first research question, I used descriptive analyses to measure the level of tuition and fee charges, room and board charges, and grant aid expenditures in 2006 constant dollars over the sample period for each sector of postsecondary education in Florida relative to the Southeast and U.S. comparison groups. The variables analyzed are list tuition and fee charges, list room and board charges, and institutional grant aid per FTE. Institutional grant aid per FTE is calculated for each year in the sample period by dividing total institutional grant aid by the total number of undergraduate and graduate FTEs. The analysis examines enrollment-weighted data to avoid exaggerating the charges and expenditures of a large number of institutions with small enrollment numbers. T-tests

are used to identify statistically significant differences in the variable means between Florida institutions and the two comparison groups of institutions.

Research Question Two

How do the annual changes in tuition and fee charges, room and board charges, and grant aid expenditures at Florida colleges and universities compare with changes at institutions in other states after the introduction of the Bright Futures merit-based aid program?

To address the second research question I used descriptive analyses to measure the year-over-year percentage change in tuition and fee charges, room and board charges, and grant aid expenditures in 2006 constant dollars over the sample period for each sector of postsecondary education in Florida relative to the Southeast and U.S. comparison groups. T-tests are used to identify statistically significant differences in the percentage changes between Florida institutions and each of the two comparison groups of institutions.

Research Question Three

Relative to a comparison group of institutions in surrounding states, how do tuition and fee charges, room and board charges, and grant aid expenditures at Florida colleges and universities react to the introduction of the state merit-based aid program after controlling for institutional and state economic characteristics?

To address the third research question, I took advantage of the opportunity for a quasi-natural experiment provided by the introduction of the Bright Futures program in Florida by using a differences-within-differences method. Similar to earlier research (Long, 2002, 2003), I used surrounding states from the southeastern region that have not introduced a merit-based aid program during the eight years as a comparative control group to account for changes in postsecondary education that have an effect on all

institutions. To test for robustness of the regression results in the Southeast, I also use a second control group that consists of all states in the United States that had not introduced a merit-based aid program during the eight years. This differences-within-differences method was also used in earlier studies that examined student response to merit-based aid in Georgia and New Mexico (Binder et al., 2002; Cornwell & Mustard, 2001; Dynarski, 2000). This method is appropriate when a policy change applies to one population and not another, which naturally creates a randomly selected control group (Meyer, 1995). This method assumes that omitted variables that affect institutional charges and aid do not differ between the treatment and control groups before and after the change.

Following Meyer's (1995) instruction that this design is best when the study group is most similar to the control group, I used colleges in surrounding southeastern states but excluded institutions in states that introduced merit-based aid programs before or during the study period. To test whether results vary based on the comparison group, the data are run with both institutions in the southeastern region and institutions in the entire United States as comparison groups.

In Long's (2002, 2003) analyses, she eliminated from the control group institutions that were direct competitors for Georgia students. Similar to Long, in this study competitors are defined as out-of-state institutions with more than 5% of Florida students in their freshman class. Similarly, for this study, these institutions are excluded, because, given their reliance on Florida students, they might be motivated to react to Bright Futures as an out-of-state competitor for the same students by lowering their prices to attract them. This competitor effect violates the assumption of independence

required for the control group. For this study, direct competitors with Florida are excluded from the control groups.

The differences-within-differences method assumes that all variation between the study group and the control group is attributable to the policy intervention. Therefore, to control for expected differences in prices across states and institutions, a set of controls is used to measure both postsecondary education supply and demand. As shown in equation (1), this function can be interpreted as the equilibrium price in which supply and demand meet for a specific institution. This function includes sets of independent variables for state characteristics, institutional characteristics, and year fixed-effect variables to control for time trends that are assumed to define the institutional price, and is applied to the whole analytic sample (Florida and control group institutions):

$$Price_{ij} = B_0 * X(\text{ state unemployment, state per capita income, state educational attainment level, state postsecondary capacity, institutional sector, endowment size per FTE, state appropriations per FTE, year})_{ij} + \text{error term}_{ij}. \quad (1)$$

Similar to Long (2002, 2003), the price function is extended to measure three aspects of Bright Futures: (a) the effect of Bright Futures after the introduction; (b) the effect of Bright Futures in institutions with high concentrations of scholarship recipients; and (c) the effect of Bright Futures in each year separately, 1997, 1998, 1999, and 2000, to determine whether the difference increases as the numbers of recipients grow each year.

To measure the effect of Bright Futures on price (tuition and fees, room and board, and grant aid per FTE) the regression model is separately applied to each measure of price. The model includes variables that capture the availability of the Bright Futures

program by adding dummy variables for the state of Florida, for *After,* which indicates that the year is after the program introduction, and an interaction term:

$$Price_{ij} = B_0 * X_{ij} + b_1 (Florida_j * After_i) + b_2 * (Florida_j) + b_3 * (After_i) + error\ term_{ij}, \quad (2)$$

where *i* indicates the year and *j* indicates each institution. The parameter b_1 measures whether Florida institutional prices respond differently from other institutional prices after the introduction of the Bright Futures program. The variables *Florida* and *After* are dichotomous variables in which *Florida* = 1 for all Florida institutions, *After* = 1 for the year the program was introduced (e.g., 1997) and all subsequent years, and 0 is for years before the introduction. No Florida institutions in the IPEDS sample were ineligible for Bright Futures during the study period, therefore, *Florida* = 1 for all Florida institutions.

To measure the effect of Bright Futures in institutions with high concentrations of scholarship recipients, the Florida institutions are divided based on the share of the student body receiving Bright Futures. If the change in Florida college prices is caused by the introduction of the Bright Futures program, the increase in price should be greater at institutions with the highest number of enrolled awardees. To test whether the change in price is greater at the institutions with the highest number of Bright Futures recipients, the following equation is used:

$$Price_{ij} = B_0 * X_{ij} + b_1 (HighFutures * After) + b_2 * (HighFutures) + b_3 * (LowFutures * After) + b_4 * (LowFutures) + b_5 * (After) + error\ term, \quad (3)$$

where *HighFutures* is a dichotomous variable defined as 1 for those Florida institutions in the top half of the distribution of schools ranked by the proportion of students receiving the award within each sector and *LowFutures* is a dichotomous variable defined as 1 for those Florida institutions in the bottom half of the same distribution within each sector. Schools in the control group are marked 0 for both variables and correspond to the omitted category for this variable.

To measure the effect of Bright Futures in each year after the introduction of Bright Futures, the following equation is used:

$$Price_{ij} = B_0 * X_{ij} + b_1 (Florida_j) + b_2 * (Florida_j * 1997_i) + b_2 * (Florida_j * 1998_i) + b_2 * (Florida_j * 1999_i) + b_2 * (Florida_j * 2000_i) + error\ term_{ij}. \quad (4)$$

The four sectors examined are public four-year, public two-year, private four-year, and for-profit. Each sector is examined separately, and only analyses of four-year institutions are extended to include controls for institutional selectivity and wealth. To address the research questions, the coefficients are estimated using by ordinary least squares (OLS) regression analysis which is an appropriate method to estimate the relative effects of multiple independent factors on a continuous variable outcome.

Variables

The dependent and independent variables for this analysis are described in this section. The three measures of price response are delineated first, followed by primary independent variables and control variables for institutional and state characteristics. The regression analyses are run separately on each measure of price response (tuition and

fees, room and board rates, and institutional grants per FTE). To control for inflation, the three measures of price response are converted into 2006 dollars (to put the variable in current terms) by using the Consumer Price Index (CPI). The academic base year 2006-2007 is based on the CPI for August 2006. The calendar year is based on the CPI for January 2006. Table 3.10 shows the factors used to convert each year to 2006 constant dollars. The CPI is based on measured changes in consumer prices calculated by the Bureau of Labor Statistics, which defines various goods and services that consumers purchase based on the average monthly prices of items in the following groups: food and beverages, housing, apparel, transportation, medical care, recreation, education and communication, and other goods and services.

Table 3.10
Consumer Price Index with Factors Used to Convert Current to Constant (2006) Dollars

Academic Year Conversion (August – July)			Calendar Year Conversion (January – December)		
Academic Year	CPI-U	Factor to Convert	Calendar Year	CPI-U	Factor to Convert
93-94	144.8	1.41	1993	144.5	1.40
94-95	149.0	1.37	1994	148.2	1.36
95-96	152.9	1.33	1995	152.4	1.32
96-97	157.3	1.30	1996	156.9	1.29
97-98	160.8	1.27	1997	160.5	1.26
98-99	163.4	1.25	1998	163.0	1.24
99-00	167.1	1.22	1999	166.6	1.21
00-01	172.8	1.18	2000	172.2	1.17
01-02	177.5	1.15	2001	177.1	1.14
02-03	180.7	1.13	2002	179.9	1.12
03-04	184.6	1.11	2003	184.0	1.10
04-05	189.5	1.08	2004	188.9	1.07
05-06	196.4	1.04	2005	195.3	1.03
06-07	203.9	1.00	2006	201.6	1.00

Source: U.S. Department of Labor, Bureau of Labor Statistics, ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt

Dependent Variable: Price Response

The outcomes for this study are three separate measures: tuition and fee charges, room and board charges, and institutional grant aid expenditures. For ease of interpretation all dollar variables are converted into a natural logarithm, a commonly used method by economists in the interpretation of percentage change in dollar values (Long, 2002, 2003). Tuition and fee charges are defined as the list price for a full academic year or the equivalent of two semesters and/or 30 credit hours for a full-time student at an institution. Because the majority of for-profit institutions charge tuition by program rather than by semester, tuition for this sector is defined as the list price for the largest program offered. The limitation of this method is the variation in which the program is largest across the study years. However, using the semester tuition and fee charge in the for-profit analysis would result in eliminating 90% of for-profit institutions from the analytic sample.

Room and board charges are defined as the price for a full academic year of on-campus residence and related on-campus living expenses, such as a meal plan at an institution. Room and board is charged predominantly by four-year institutions where a portion of the student body lives on campus. Therefore, room and board charges are examined only in four-year institutions. For this variable to be measured, an institution had to indicate that it offered both room and board at the institution for at least seven of the eight study years. In some cases, institutions reported the combined charge for room

and board, and in other cases they reported them separately. If reported separately, these values were added together.

Institutional grant aid expenditures are converted from institutional totals into grant amounts per total (e.g., undergraduate and graduate) FTE. Similar to room and board charges, this outcome variable is measured only for four-year institutions because the majority of public two-year and for-profit institutions do not offer institutional grants. Also, to preserve the quality of the analysis, only four-year institutions are examined because the extent to which grant aid data are missing or simply not offered is not made clear in three of the eight years of IPEDS. The lack of clarity on missing data in IPEDS is a result of the finance survey not being released with imputations for 1996, 1997, and 1999. Furthermore, financial aid variables are completely missing in 1997 for institutions in the for-profit sector.

The FTE of undergraduate and graduate enrollment for an institution is derived by adding together the full-time enrollment of an institution and an estimated equivalent of part-time enrollment by using a method parallel to that used by NCES in the IPEDS database. FTE of undergraduates is used to weight average prices in the descriptive analyses. FTE of both undergraduates and graduates is used for estimating institutional grants per FTE because IPEDS reports grant expenditures for all students together. The full-time equivalent of part-time enrollment is estimated by multiplying the part-time enrollment by factors that vary by control and level of institution and level of student. The following factors are recommended by NCES: public four-year = .403543, not-for-profit and for-profit, private four-year = .392857, public two-year and less-than-two year = .335737, and all other sectors = .397058 (IPEDS, 2000, on-line Data Analysis System).

Primary Independent Variables Related to Bright Futures

The primary independent variable for this study is the introduction of the Florida Bright Futures program. *After* indicates whether the year of the observation is before or after implementation of the Florida Bright Futures program. The variable is defined as 1 for every year after program implementation. Because the program was implemented in the 1996-1997 academic year and institutions may not have had enough time to change prices in response, the indicator is marked 1 for the next year, 1997-1998, and continues for every year thereafter.

To test whether the effect of Bright Futures on price is greater at the institutions with relatively more recipients than for other institutions, the variable *HighFutures* and *LowFutures* is constructed as a dichotomous variable indicating a high concentration of scholarship recipients at a particular institution. The variable is defined as 1 for those institutions in the top half of the distribution of Florida institutions in each sector ranked by the percentage of enrolled students with the scholarship. The *HighFutures* and *LowFutures* variables are calculated separately for each sector to determine which institutions are in the bottom and top half of each sector rather than across institutions. To determine if the use of the top and bottom half were the most appropriate definition, the regression results are also analyzed with the definition of high concentration as the 75^{th} percentile and the low concentration as the 25^{th} percentiles. The direction and significance of the results are identical using both definitions.

Other variables related to the Bright Futures program are used to calculate summary statistics to describe the Bright Futures program. *Bright Futures Recipients*

measures the number of Bright Futures recipients, including both new and renewal recipients, for each institution in each academic year. This information comes the Florida Bright Futures program office, and it is used to create the *HighFutures* and *LowFutures* variables. Information on the amounts of Bright Futures scholarships is used for summary descriptions of the scholarship program. The amounts are adjusted for inflation by using the CPI.

Other Institutional Variables

Four sectors of postsecondary institutions are examined: public four-year, private four-year, public two-year, and for-profit. The sectors are based on an IPEDS variable that is derived from information on the control (public and private) and level (two-year and four-year sectors) of each IPEDS institution. This study also includes the following measures of institutional characteristics: selectivity measured by *Barron's Profile of American Colleges and Universities,* the institutional mission as measured by *Carnegie Classification,* and institutional wealth as measured by *Endowment Size per FTE*. These measures control for characteristics that vary within the four-year sectors that may also predict changes in price.

Because of differences in institutional incentives related to pricing, student academic quality and institutional prestige (Clotfelter, 1996; Winston, 1999), institutional selectivity is expected to be associated with differences in price response in four-year institutions. In this study, institutional selectivity is measured with the *Barron's Profile* categories: less competitive, competitive, very competitive, highly competitive, and most competitive. Institutions that are unclassified by Barron's or noncompetitive are used as

the reference category. To obtain these data, the most recent *Barron's Profile of American Colleges and Universities, 2007* categories were added to the data set. Although institutions may have changed profile categories between the study period and 2007, the categories are appropriate because they indicate the results of an institutional orientation toward prestige and selectivity that theory suggests influence price decisions during the study period.

In addition to selectivity, earlier research demonstrated that endowment size, a proxy for institutional wealth (Clotfelter, 1996), is positively correlated with price response (McPherson & Schapiro, 1993). For this study, *Endowment Size per FTE* is calculated by using data from the IPEDS finance survey. The variable is defined as the dollar amount of the ending market value of the endowment at the fiscal year end divided by the FTE of total undergraduate and graduate enrollment. Because of changes in the finance survey and in the variables used to gather information on endowments beginning in 1997, this variable is calculated based on the mean endowment in the 1993-1994 to 1996-1997 academic years divided by the undergraduate and graduate FTE in the same years.

Earlier research used Carnegie classifications to control for differences in institutional mission that contribute to differences in price response (Long, 2003; McPherson & Schapiro, 1993). For this study, 10 Carnegie classifications are used: Carnegie Research I, Carnegie Research II, Carnegie Doctoral I, Carnegie Doctoral II, Carnegie Masters Comprehensive I, Carnegie Masters Comprehensive II, Carnegie Baccalaureate Liberal Arts, Carnegie Baccalaureate II, Carnegie Associates Colleges, and

Carnegie Professional or Special Emphasis Institutions. Unclassified institutions are used as the reference category. These classifications are obtained from the IPEDS, IC Survey.

The final set of institutional variables needed for the study is state and local appropriations. Research shows that decreases in appropriations are correlated with increases in tuition and fees (McPherson & Schapiro, 1993). For this study *Appropriations per FTE* is included as a control variable in the analysis of public four-year institutions and public two-year institutions. In the public four-year sector *Appropriations per FTE* is based only on state appropriations. In the public two-year sector *Appropriations per FTE* is based on both state and local appropriations, because local sources provide a significant share of revenues for this sector. For-profit institutions and private four-year institutions receive limited amounts of both state and local appropriations relative to public-sector institutions. Total state (and local) appropriations are divided by the FTE enrollment for the institution and year. This variable is adjusted for inflation by using the CPI.

State Variables

Researchers found that several other aspects of state characteristics predict differences in institutional prices, including state unemployment, state per capita income, state educational attainment, and postsecondary enrollment capacity (Acosta, 2001; Long, 2002, 2003; McPherson & Schapiro, 1993; Rizzo & Ehrenberg, 2003). Measures of these state characteristics are drawn from publicly available data from the U.S. Census Bureau Current Population Survey and the *Digest of Education Statistics.*

Higher state unemployment rates translate into greater demand for postsecondary education because lack of employment opportunities drives down the opportunity costs of attending college for potential students (Long, 2002, 2003; McPherson & Schapiro, 1993). Unemployment rates also indicate general state economic conditions that may affect price through the effect of the state's economic well being on the institutions' ability to provide postsecondary education (Rizzo & Ehrenberg, 2003). For this study *State Unemployment* is defined as the average annual unemployment rate for adults age 25 and older in the given year.

Higher state incomes translate into greater supply for postsecondary education because greater state income means that more potential resources are available for postsecondary institutions through direct appropriations and other donative channels (McPherson & Schapiro, 1993; Rizzo & Ehrenberg, 2003). Higher state incomes may also indicate general state economic conditions that may affect price through increases in student demand for education. For this study, *State per Capita Income* is defined as the total personal income divided by total mid-year population in the state. Data are adjusted for inflation with the CPI and converted to a natural logarithm for each year of the study.

States with higher educational attainment, measured by the percentage of state residents age 25 and older with a bachelor's degree, are by definition states with a higher demand for postsecondary education. Therefore, inclusion of *State Educational Attainment* is used in this study to control for differences in demand across states.

Earlier research (Rizzo & Ehrenberg, 2003) and theory support the notion that the capacity of postsecondary education in a state has a positive relationship with prices. When a state has reached seat capacity and can no longer expand the supply of

postsecondary opportunities, prices escalate. Therefore, in this study *Postsecondary Capacity* is calculated in a manner similar to others (Rizzo & Ehrenberg), with a ratio of the potential pool of students within a state to the actual enrollment. To calculate this variable, the number of enrolled students (based on the *Digest of Education Statistics*) is divided by the number of recent high school graduates (based on the Current Population Survey) for each year of the study.

Limitations

There are several methodological and data quality limitations in this study. First, because the study relies on a differences-within-differences methodology, it is assumed that there are no interactions between time and the relevant price response variables other than the Florida state merit-based aid and other explicit controls. To the extent that other unidentified and uncontrolled for factors are driving the relative change in prices between Florida schools and other institutions, the study may falsely attribute the effect of those other factors to the introduction of the Bright Futures program. For example, if a change in economic conditions during the study period affect students and institutions differently across states and this change occurs at the same times as Bright Futures, a portion of this effect may be erroneously included in the estimate of the effect of the merit-based aid introduction (Meyer, 1995).

Second, the control group of institutions in the southeastern region used in this study is small because states are excluded if they introduced a merit-based aid program before or during the study period. Having a larger control group that includes all of the southeastern states would be ideal because it would increase the statistical precision of

the analysis by allowing for a greater number of observations. However, institutions in five of the states in that group are eliminated from the study because they introduced similar state merit-based aid programs either before or during the study period. These exclusions decrease the population size and thus the precision of the estimates.

Third, the quasi-natural experimental methodology assumes a discrete start to the intervention that separates the study group and the control group. Florida Bright Futures, however, is an expansion of a previous state grant program. The expansion of Bright Futures increased the number of scholarship recipients by 93.0% and the total award dollars by 53.6% in its first year of introduction, indicating that the expansion itself was a major event that may be studied. However, the results of this study still need to be interpreted as the effects related to the increase in the new program and not the effects of an entirely new program.

A final limitation of the study is the quality of the available data. In 1996, 1997, and 1999, NCES was unable to complete the final release of the IPEDS survey. Therefore, missing data were not imputed by the NCES staff for all finance variables in 1996 and 1997. Furthermore, when NCES made the transition to an on-line survey in 2000 most of the survey staff resources were focused on the transition; therefore no final adjudicated data were ever released for the 1999 IPEDS survey sections. Table 3.11 illustrates that the data were not randomly missing. I created a cross-tabulation of the sample of institutions with the analytic sample after institutions with missing data were excluded. I used a chi-square test to the statistical significance of the differences between groups. Public four-year institutions were more likely to have missing data (7.8%) in one of the 8 years of the study period and, therefore, were less likely than other institutions to

be selected for the final analytic sample. Also, missing data disproportionately occurred in the Far West geographic regions (19.4%), largely concentrated in the state of California (26.8% missing). Idaho and Indiana followed California with large percentages of missing data (40% and 15.6%, respectively).

Despite these limitations, this study is worth conducting because it extends and improves the empirical testing of institutional price response to state government subsidies and extends findings about the effects of state merit-based aid to another state, Florida. Also, the results of this study offer important findings for policymakers about the effects of state merit-based aid programs on institutional prices.

Table 3.11
Percentage of Institutions Excluded Because of Missing Data for Tuition and Fees or Enrollment by Sector, Geographic Region and State

Characteristic	% Missing Data for Tuition and Fees or Enrollment
Sector***	
Public Four-Year	7.8%
Private Four-Year	3.5%
For Profit	5.4%
Public Two-Year	6.3%
Geographic Region***	
New England	1.2%
Mid-Atlantic	2.3%
Great Lakes	4.9%
Plains	4.4%
Southeast	1.7%
Southwest	3.8%
Rocky Mountains	5.6%
Far West	19.4%

Note: Three asterisks (***) indicate significance at the $p < .001$ level using a chi-square test. Sample excludes Florida competitor institutions and institutions from states that introduced a merit-based aid program before or during the study period.

Source: Analyses of IPEDS 1993-2000

Table 3.11 (Continued)
Percentage of Institutions Excluded Because of Missing Data for Tuitions and Fees or Enrollment by Sector, Geographic Region and State

State***	% Missing
Alabama	0.0%
Arkansas	1.8%
Arizona	6.3%
California	26.8%
Colorado	3.1%
Connecticut	1.9%
District of Columbia	0.0%
Delaware	0.0%
Florida	3.2%
Hawaii	6.3%
Iowa	3.9%
Idaho	40.0%
Illinois	2.4%
Indiana	15.6%
Kansas	1.6%
Massachusetts	0.9%
Maryland	0.0%
Maine	0.0%
Minnesota	7.0%
Montana	0.0%
North Carolina	1.9%
North Dakota	5.3%
Nebraska	6.3%
New Hampshire	3.8%
New Jersey	1.1%
New York	4.8%
Ohio	2.5%
Oklahoma	7.4%
Oregon	2.2%
Pennsylvania	1.2%
Rhode Island	0.0%
South Carolina	2.0%
South Dakota	0.0%
Tennessee	1.5%
Texas	2.1%
Utah	5.3%
Virginia	0.0%
Vermont	0.0%
Washington	1.3%
Wisconsin	1.9%
West Virginia	0.0%
Wyoming	0.0%

Note: Three asterisks (***) indicate significance at the $p < .001$ level using a chi-square test. Sample excludes Florida competitor institutions and institutions from states that introduced a merit-based aid program before or during the study period.

Source: Analyses of IPEDS 1993-2000

RESULTS

CHAPTER 4

Introduction

Descriptive and ordinary least squares (OLS) regression analyses that include year fixed-effects and other controls are used in this study. Institution-level data for the 1993-1994 to 2000-2001 academic years from the Integrated Postsecondary Education Data System (IPEDS) and from the Florida Bright Futures program are used to explore the effect of the introduction of a merit-based financial aid program on postsecondary prices in Florida relative to two comparison groups of states. For each research question, the analyses describe each sector of postsecondary education separately: public four-year, public two-year, private four-year, and for-profit. Research questions one and two consist of descriptive analyses. Research question three uses OLS regression and a differences-within-differences approach with controls for state and institutional characteristics to measure three aspects of price in Florida relative to the comparison groups: price before and after the introduction of Bright Futures, price for institutions with high and low concentrations of Bright Futures recipients, and price for each year of study after the introduction of Bright Futures to identify in which year price varies most. Research findings for each of the three research questions are presented.

Research Question One: Price Level in Florida Compared with Control Group States

For the first research question tuition and fees charged in institutions in Florida and institutions in other states are analyzed for four sectors: public four-year, public two-

year, private four-year, and for-profit. Room and board charges are compared for four-year institutions only, and institutional grant aid expenditures per FTE are compared for private four-year institutions only. These analyses explore how these charges and expenditures for institutions in Florida compare with those for institutions in the Southeast control group for the study period, 1993-2000. These analyses are repeated with institutions nationwide as the control group. For each analysis, states that have introduced a merit-based aid program before or during the study period are excluded. Competitor institutions, defined as institutions with more than 5% of first-year full-time enrollees from Florida for any year, are also excluded from all analyses. Independent-sample t-tests are used to measure the difference in the means between Florida institutions and the two comparison groups. The results are presented for each of the dependent variables: tuition and fees, room and board, and institutional grants. In Tables 4.1 to 4.3 the results are summarized.

Tuition and Fees

Average tuition and fee charges were lower in Florida institutions than in the rest of the United States for all sectors and years, with the exception of four years in the for-profit sector (1995, 1997, 1998 and 1999). Table 4.1 shows the average tuition and fees for public four-year institutions in Florida compared with the Southeast control group and the U.S. control group. In the public four-year sector, average tuition and fees were lower

Table 4.1
Average Tuition and Fees for Institutions in 2006 Dollars in Florida Compared with Institutions in Southeast and U.S. Control Groups by Sector and by Year: 1993 to 2000

	Florida	Southeast Control Group	U.S. Control Group	Florida minus Southeast	% Difference	Florida minus U.S.	% Difference
Public Four-Year							
1993	$2,512	$3,385	$3,719	-$873 *	-25.8%	-$1,207 *	-32.5%
1994	$2,440	$3,462	$3,800	-$1,022 *	-29.5%	-$1,360 *	-35.8%
1995	$2,356	$3,564	$3,987	-$1,208 *	-33.9%	-$1,631 *	-40.9%
1996	$2,319	$3,679	$4,091	-$1,359 *	-36.9%	-$1,772 *	-43.3%
1997	$2,423	$3,739	$4,188	-$1,315 *	-35.2%	-$1,764 *	-42.1%
1998	$2,526	$3,874	$4,303	-$1,348 *	-34.8%	-$1,777 *	-41.3%
1999	$2,739	$3,813	$4,370	-$1,074 *	-28.2%	-$1,631 *	-37.3%
2000	$2,794	$3,866	$4,425	-$1,072 *	-27.7%	-$1,631 *	-36.9%
N	9	75	425				
Private Four-Year							
1993	$14,036	$12,851	$16,305	$1,184 *	9.2%	-$2,270 *	-13.9%
1994	$14,329	$13,422	$16,756	$907 *	6.8%	-$2,427 *	-14.5%
1995	$14,736	$13,808	$17,287	$927 *	6.7%	-$2,551 *	-14.8%
1996	$15,229	$14,208	$17,723	$1,021 *	7.2%	-$2,494 *	-14.1%
1997	$15,562	$14,685	$18,202	$877 *	6.0%	-$2,640 *	-14.5%
1998	$15,972	$15,212	$18,788	$760 *	5.0%	-$2,817 *	-15.0%
1999	$16,478	$15,709	$19,338	$769 *	4.9%	-$2,861 *	-14.8%
2000	$17,266	$15,991	$19,467	$1,276 *	8.0%	-$2,201 *	-11.3%
N	36	79	804				

Note: An asterisk (*) indicates significance at the $p < .05$ level.
Data are weighted by FTE of undergraduates. Control groups exclude institutions from states that introduced merit-based aid programs before or during the study period, and institutions that were Florida competitors with more than 5% of first-year, full-time undergraduate enrollment from Florida in any year (n=113 competitors in U.S. control group). Means are compared using independent-samples t-tests procedures.

Source: Analyses of IPEDS: 1993-2000

Table 4.1 (Continued)
Average Tuition and Fees in 2006 Dollars for Institutions in Florida Compared with Institutions in Southeast and U.S. Control Groups by Sector and by Year: 1993 to 2000

	Florida	Southeast Control Group	U.S. Control Group	Florida minus Southeast	% Difference	Florida minus U.S.	% Difference
Public Two-Year							
1993	$1,482	$1,761	$2,170	-$279 *	-15.8%	-$688 *	-31.7%
1994	$1,458	$1,785	$2,283	-$327 *	-18.3%	-$825 *	-36.1%
1995	$1,427	$1,826	$2,353	-$399 *	-21.8%	-$926 *	-39.4%
1996	$1,448	$1,824	$2,392	-$376 *	-20.6%	-$944 *	-39.5%
1997	$1,544	$1,890	$2,423	-$347 *	-18.3%	-$879 *	-36.3%
1998	$1,626	$1,912	$2,459	-$286 *	-15.0%	-$832 *	-33.9%
1999	$1,652	$1,898	$2,481	-$246 *	-12.9%	-$829 *	-33.4%
2000	$1,704	$1,983	$2,298	-$279 *	-14.1%	-$594 *	-25.9%
N	43	136	728				
For-Profit							
1993	$8,826	$8,212	$8,975	$614 *	7.5%	-$149 *	-1.7%
1994	$8,605	$8,269	$9,228	$337 *	4.1%	-$622 *	-6.7%
1995	$9,730	$8,701	$9,697	$1,029 *	11.8%	$34	0.3%
1996	$9,502	$8,835	$9,829	$667 *	7.6%	-$327 *	-3.3%
1997	$10,530	$9,456	$9,945	$1,074 *	11.4%	$585 *	5.9%
1998	$10,778	$9,441	$10,258	$1,338 *	14.2%	$521 *	5.1%
1999	$10,536	$9,901	$10,575	$635 *	6.4%	-$39	-0.4%
2000	$11,807	$9,691	$12,052	$2,116 *	21.8%	-$245 *	-2.0%
N	65	98	875				

Note: An asterisk (*) indicates significance at the $p < .05$ level.
Data are weighted by FTE of undergraduates. Control groups exclude institutions from states that introduced merit-based aid programs before or during the study period, and institutions that were Florida competitors with more than 5% of first-year, full-time undergraduate enrollment from Florida in any year (n=113 competitors in U.S. control group). Means are compared using independent-samples t-tests procedures.

Source: Analyses of IPEDS: 1993-2000

for institutions in Florida than both institutions in the United States and the Southeast. Tuition and fees were consistently between 25.8% and 36.9% lower for institutions in Florida than for institutions in the Southeast, and between 32.5% and 43.3% lower for institutions in Florida than in the U.S. control group. Some of these large differences may be attributed to Florida's historic commitment to low tuition in the public sector, a commitment enforced through legislative authority. Tuition and fees in the public four-year sector actually declined in constant dollars in the first four years, whereas tuition and fees in the Southeast and U.S. control groups increased.

Table 4.1 also shows average tuition and fees for private four-year institutions in Florida compared with the Southeast control group and the U.S. control group. In contrast to the public four-year sector, average tuition and fee levels in the private four-year sector were 4.9% to 9.2% higher in Florida compared with the Southeast control group. However, tuition and fees in the private four-year sector were 11.3% to 15.0% lower in Florida than in the United States.

Public two-year colleges in Florida have consistently lower tuition and fee levels relative to both the Southeast and U.S. control groups. Table 4.1 shows that public two-year institutions in Florida had tuition and fee levels that were 25.9% to 39.5% lower than the United States and 12.9% to 21.8% lower than the Southeast control group. These results again reflect Florida's commitment to low tuition in the public sector.

A comparison of the for-profit sector tuition and fee levels is also shown in Table 4.1. For this sector, average tuition and fees in Florida's for-profit institutions were 4.1% to 21.8% higher than for the Southeast control group. Differences in tuition and fees for for-profit institutions in Florida and in the U.S. control group varied between 1993 and

2000, with levels that were 2.0% to 6.7% lower in Florida than in the United States in 1993, 1994, 1996, and 2000, 5.1% to 5.9% higher in 1997 and 1998, and not different in 1995 and 1999. Some of the inconsistency from year to year may be explained by the definition of tuition and fees used for this study in the for-profit sector. Because for-profit institutions frequently price tuition and fees by program rather than semester, some of the variation may reflect changes in which programs are largest at the institutions.

In summary, tuition and fee levels were lower on average for both public four-year and public two-year institutions in Florida than in both the Southeast and U.S. control groups. Private four-year tuition and fee rates were higher on average in Florida than in the Southeast but lower on average in Florida than in the United States. Differences in tuition and fees between Florida and the U.S. comparison groups in the for-profit sector varied in the 1990s. Tuition and fees were consistently higher at Florida for-profit institutions than Southeast for-profit institutions.

Room and Board

Room and board charges during the study period, 1993-2000, were significantly higher in the public four-year sector in Florida than in the Southeast control group and in the U.S. control group. Table 4.2 shows that room and board rates were consistently between 5.6% and 9.6% higher for public four-year institutions in Florida than for public four-year institutions in the Southeast control group and between 1.3% and 6.8% higher in Florida than in the U.S. control group.

Average room and board charges in the private four-year sector were higher in Florida than in the Southeast control group, but lower than in the U.S. control group.

Table 4.2 shows that room and board rates in the private four-year sector were 5.2% to 11.3% higher in Florida than in the Southeast control group. But room and board rates in the private four-year sector were 3.8% to 7.9% lower in Florida than in the U.S. control group. No analysis was conducted for the public two-year and for-profit sectors because these sectors typically do not offer room and board.

Table 4.2
Average Room and Board in 2006 Dollars for Institutions in Florida Compared with Institutions in Southeast and U.S. Control Groups by Sector and by Year: 1993 to 2000

	Florida	Southeast Control Group	U.S. Control Group	Florida minus Southeast	% Difference	Florida minus U.S.	% Difference
Public Four-Year							
1993	$5,454	$5,043	$5,105	$411 *	8.1%	$349 *	6.8%
1994	$5,477	$4,997	$5,162	$480 *	9.6%	$315 *	6.1%
1995	$5,480	$5,019	$5,231	$461 *	9.2%	$249 *	4.8%
1996	$5,393	$5,065	$5,253	$327 *	6.5%	$140 *	2.7%
1997	$5,524	$5,143	$5,358	$381 *	7.4%	$166 *	3.1%
1998	$5,801	$5,373	$5,538	$428 *	8.0%	$263 *	4.7%
1999	$5,739	$5,432	$5,664	$307 *	5.6%	$75 *	1.3%
2000	$6,122	$5,657	$5,771	$465 *	8.2%	$351 *	6.1%
N	7	64	320				
Private Four-Year							
1993	$6,171	$5,772	$6,676	$398 *	6.9%	-$505 *	-7.6%
1994	$6,210	$5,901	$6,746	$309 *	5.2%	-$536 *	-7.9%
1995	$6,327	$5,968	$6,872	$359 *	6.0%	-$546 *	-7.9%
1996	$6,470	$6,055	$6,937	$414 *	6.8%	-$467 *	-6.7%
1997	$6,561	$6,134	$7,026	$427 *	7.0%	-$464 *	-6.6%
1998	$6,709	$6,213	$7,162	$496 *	8.0%	-$453 *	-6.3%
1999	$6,978	$6,272	$7,257	$706 *	11.3%	-$279 *	-3.8%
2000	$6,977	$6,438	$7,361	$539 *	8.4%	-$383 *	-5.2%
N	29	66	686				

Note: An asterisk (*) indicates significance at the $p < .05$ level.
Data are weighted by FTE of undergraduates. Control groups exclude institutions from states that introduced merit-based aid programs before or during the study period, and institutions that were Florida competitors with more than 5% of first-year, full-time undergraduate enrollment from Florida in any year (*n*=113 competitors in U.S. control group). Means are compared using independent-samples t-tests procedures.

Source: Analyses of IPEDS: 1993-2000

Institutional Grants

No analysis was conducted for the public two-year and for-profit sectors because these sectors do not extensively offer institutional grants. Also, no analysis was conducted for the public four-year sector as a result of the small sample size after cases were selected with available and accurate data. Analysis of the reported data showed extreme outliers in the grant aid amounts that could not be verified, leaving only two of the public four-year institutions in the Florida sample, an insufficient sample size for analysis.

Average institutional grant expenditures per FTE for every year during the study period with the exception of 1995 were lower in Florida than in the Southeast and U.S. control groups for private four-year institutions. Table 4.3 shows that, in the private four-year sector, average institutional grant expenditures per FTE were between 9.3% and 28.3% lower in Florida than in the Southeast control group for every year except 1995 (which was 20.4% higher). Similarly, institutional grant expenditures per FTE were between 12.7% and 20.9% lower in Florida than in the U.S. control group for every year except 1995 (which was 4.6% higher).

Table 4.3
Average Institutional Grants per FTE in 2006 Dollars for Institutions in Florida Compared with Institutions in Southeast and U.S. Control Groups by Sector and by Year: 1993 to 2000

	Florida	Southeast Control Group	U.S. Control Group	Florida minus Southeast	% Difference	Florida minus U.S.	% Difference
Private Four-Year							
1993	$3,046	$3,558	$3,818	-$512 *	-14.4%	-$772 *	-20.2%
1994	$3,305	$3,784	$4,080	-$480 *	-12.7%	-$776 *	-19.0%
1995	$4,559	$3,786	$4,356	$773 *	20.4%	$202 *	4.6%
1996	$3,848	$4,695	$4,866	-$846 *	-18.0%	-$1,017 *	-20.9%
1997	$4,175	$5,822	$5,148	-$1,647 *	-28.3%	-$972 *	-18.9%
1998	$4,815	$5,393	$5,377	-$578 *	-10.7%	-$562 *	-10.5%
1999	$4,540	$5,416	$5,547	-$876 *	-16.2%	-$1,007 *	-18.2%
2000	$5,126	$5,652	$5,871	-$526 *	-9.3%	-$744 *	-12.7%
N	12	31	468				

Note: An asterisk (*) indicates significance at the $p < .05$ level.
Data are weighted by FTE of undergraduates. Control groups exclude institutions from states that introduced merit-based aid programs before or during the study period, and institutions that were Florida competitors with more than 5% of first-year, full-time undergraduate enrollment from Florida in any year (n=113 competitors in U.S. control group). Means are compared using independent-samples t-tests procedures.
The sample of institutions in this analysis further excludes institutions with greater than 50% variation in grants per FTE over any two-year period.

Source: Analyses of IPEDS: 1993-2000

Research Question Two: Annual Price Change in Florida Compared with Control Group States

The second research question examines how the year-over-year changes in tuition and fees, room and board charges, and grant aid expenditures at Florida colleges and universities compare with changes at institutions in other states after the introduction of Bright Futures. The annual change in tuition and fees is analyzed for each of the four

sectors: public four-year, public two-year, private four-year, and for-profit. Room and board charges are analyzed for four-year institutions only. Institutional grant aid expenditures per FTE are analyzed for private four-year institutions only. The annual percentage changes for tuition and fees, room and board, and institutional grants per FTE by sector are presented in separate tables. These rates of change are compared before and after the introduction of Bright Futures for the two control groups. The analyses exclude states that introduced a merit-based aid program before or during the study period. Competitor institutions, defined as institutions with more than 5% of first-year full-time enrollees from Florida for any year, are also excluded from all analyses. Independent-sample t-tests measure differences in the year-over-year percentage change in the prices and expenditures of the Florida institutions and each of the two comparison groups. Results are presented in the next three sections for each dependent variable: tuition and fees, room and board, and institutional grants. In Tables 4.4 to 4.6 the results are summarized.

Tuition and Fees

The annual percentage change in tuition and fees for institutions in Florida compared with institutions in the Southeast and U.S. control groups are summarized in Table 4.4. Differences in the annual change in tuition and fees between institutions in Florida and institutions in the control groups are evident only in the public sectors. In both the private four-year sector and the for-profit sector, the year-to-year changes in tuition and fees were comparable for institutions in Florida and the Southeast control group, as well as between institutions in Florida and institutions in the U.S. control group.

Table 4.4
Annual Percentage Changes in Average Tuition and Fees for Institutions in Florida Compared with Institutions in Southeast and U.S. Control Groups by Sector and by Year: 1993 to 2000

	Public Four-Year			Private Four-Year		
	Florida	Southeast	U.S.	Florida	Southeast	U.S.
Year						
1993	-	-	-	-	-	-
1994	-3.9%	2.1% *	3.0% *	3.0%	4.7%	3.1%
1995	-2.7%	3.6% *	5.1% *	3.1%	3.6%	3.2%
1996	-0.5%	1.9%	3.0%	3.4%	2.2%	3.0%
1997	4.5%	2.9% *	3.2%	2.2%	4.4%	3.2%
1998	4.4%	3.6%	2.4%	2.4%	3.1%	3.6%
1999	9.7%	1.2% *	2.6% *	6.2%	3.2%	3.0%
2000	1.9%	1.7%	1.2%	4.8%	2.6%	2.0%
N	9	75	425	36	79	804

	Public Two-Year			For Profit		
	Florida	Southeast	U.S.	Florida	Southeast	U.S.
Year						
1993	-	-	-	-	-	-
1994	-3.4%	0.1% *	4.8% *	-0.6%	11.9%	4.7%
1995	-1.6%	2.4% *	3.8% *	16.1%	1.4%	3.0%
1996	6.6%	-0.8% *	2.2%	10.6%	8.5%	6.2%
1997	15.8%	0.4% *	1.1% *	6.5%	3.7%	6.2%
1998	16.7%	2.9% *	2.3% *	2.8%	3.6%	4.6%
1999	11.5%	8.9%	2.3% *	3.5%	6.3%	5.2%
2000	-0.7%	5.5% *	0.2%	11.9%	4.6%	8.5%
N	43	136	728	65	98	875

Note: An asterisk (*) indicates significance at the $p < .05$ level.
Data are weighted by FTE of undergraduates. Control groups exclude institutions from states that introduced merit-based aid programs before or during the study period, and institutions that were Florida competitors with more than 5% of first-year, full-time undergraduate enrollment from Florida in any year (n=113 competitors in U.S. control group). Means are compared using independent-samples t-tests procedures.

Source: Analyses of IPEDS: 1993-2000

However, in the public four-year sector, the annual change in tuition and fees was different for institutions in Florida compared with institutions in the Southeast in 1994, 1995, 1997, and 1999 and between institutions in Florida and the U.S. control group in 1994, 1995 and 1999. Similarly, in the public two-year sector, the annual change in tuition and fees was different in Florida compared with the Southeast every year except 1999 and between Florida and the U.S. control group every year except 1996 and 2000.

The differences in annual tuition and fee changes in the public sectors varied before and after introduction of the Florida Bright Futures program in 1997. In the public four-year sector, tuition and fees decreased annually in Florida between 1993 and 1996, but increased annually in both the Southeast and the U.S. control groups over the same time period. After the introduction of Bright Futures in 1997, tuition and fees increased annually at a higher rate in Florida than in the Southeast control group in 1997 (4.5% vs. 2.9%) and 1999 (9.7% vs. 1.2%) and at a higher rate in Florida than in the U.S. control group in 1999 (9.7% vs. 2.6%).

Institutions in the public two-year sector had annual tuition and fee changes that varied in some of the years both before and after the introduction of the Florida Bright Futures program. In the public two-year institutions, tuition and fees decreased annually in Florida from 1993 to 1995 but increased in both the Southeast and the U.S. control groups in the same time period. Between 1995 and 1996, public two-year institutions in Florida increased tuition and fees by 6.6%, whereas the Southeast institutions decreased by 0.8%. After the introduction of Bright Futures in 1997, tuition and fees increased annually at a higher rate in Florida than in the Southeast control group in 1997 (15.8% vs. 0.4%) and in 1998 (16.7% vs. 2.9%). In 2000, public two-year institutions in Florida

decreased tuition and fees by 0.7%, whereas the Southeast institutions increased tuition and fees by 5.5%. Tuition and fees increased annually at a higher rate in Florida than in the U.S. control group from 1996 through 1999 by margins of 14.7 percentage points (1997), 14.4 percentage points (1998), and 9.1 percentage points (1999).

In summary, these descriptive analyses reveal differences in the annual change in tuition and fees between Florida and the control groups and, difference in the direction of the changes before and after the implementation of Bright Futures. In the public four-year and public two-year sectors, tuition and fees generally decreased in Florida, whereas they increased in the control groups before the introduction of Bright Futures. After the introduction of Bright Futures, tuition and fees generally increased by a larger percentage in Florida than in the control groups. For Research Question Three, the analyses explore how much of this change is attributable to the introduction of Bright Futures.

Room and Board

Annual changes in room and board charges between Florida and the two control groups are comparable in both the four-year public and four-year private sectors. In Table 4.5 the year-over-year changes in room and board between Florida and the Southeast and the U.S. control groups are compared for each year from 1993 to 2000. No statistically significant differences were found. In the public four-year sector, annual changes ranged from a decrease of 4.0% to an increase of 16.8% in Florida. In the private four-year sector, annual changes ranged from a decrease of 0.8% to an increase of 5.3% in Florida.

The absence of statistically significant differences suggests that room and board did not change in Florida after the introduction of the Florida Bright Futures program in either the public four-year or the private four-year sector.

Table 4.5
Annual Percentage Changes in Average Room and Board for Institutions in Florida Compared with Institutions in Southeast and U.S. Control Groups by Sector and by Year: 1993 to 2000

	Public Four-Year			Private Four-Year		
	Florida	Southeast	U.S.	Florida	Southeast	U.S.
Year						
1993	-	-	-	-	-	-
1994	-0.1%	-1.0%	0.9%	-0.8%	1.4%	1.7%
1995	-0.6%	1.0%	1.8%	1.2%	0.5%	1.5%
1996	-0.1%	0.5%	0.5%	2.0%	1.1%	1.3%
1997	1.9%	1.3%	2.0%	0.5%	1.4%	1.5%
1998	6.9%	3.4%	2.6%	2.9%	1.4%	1.6%
1999	-4.0%	2.4%	2.0%	5.3%	2.4%	2.1%
2000	16.8%	4.7%	2.4%	0.8%	1.9%	1.4%
N	7	64	320	29	66	686

Note: An asterisk (*) indicates significance at the $p < .05$ level.
Data are weighted by FTE of undergraduates. Control groups exclude institutions from states that introduced merit-based aid programs before or during the study period, and institutions that were Florida competitors with more than 5% of first-year, full-time undergraduate enrollment from Florida in any year (n=113 competitors in U.S. control group). Means are compared using independent-samples t-tests procedures.

Source: Analyses of IPEDS: 1993-2000

Institutional Grants

The year-over-year change in institution grant expenditures per FTE between Florida and the control groups is generally comparable in the private four-year sector. In Table 4.6 annual changes in institution grant expenditures per FTE in Florida are compared with institutions in the Southeast and the U.S. control groups from 1993 to 2000. The absence of statistically significant differences suggests that grants per FTE did not change in the private four-year sector after the introduction of the Florida Bright Futures program.

Table 4.6
Annual Percentage Changes in Institutional Grants for Institutions in Florida Compared with Institutions in Southeast and U.S. Control Groups by Sector and by Year: 1993 to 2000

	Public Four-Year			
	Florida	Southeast	U.S.	
1993	.	.	.	
1994	12.5%	6.9%	6.8%	
1995	8.3%	13.5%	7.3%	
1996	8.6%	11.9%	12.3%	
1997	17.7%	11.9%	6.2%	*
1998	8.8%	5.5%	6.0%	
1999	-0.2%	3.2%	4.0%	
2000	2.1%	4.3%	5.3%	
N	12	31	468	

Note: An asterisk (*) indicates significance at the $p < .05$ level.
Data are weighted by FTE of undergraduates. Control groups exclude institutions from states that introduced merit-based aid programs before or during the study period, and institutions that were Florida competitors with more than 5% of first-year, full-time undergraduate enrollment from Florida in any year (*n*=113 competitors in U.S. control group). Means are compared using independent-samples t-tests procedures.
The sample of institutions in this analysis further excludes institutions with greater than 50% variation in grants per FTE over any two-year period.

Source: from analyses of IPEDS: 1993-2000

Research Question Three: Price Response to Bright Futures with Control Variables

The third research question uses OLS regression and a differences-within-differences approach with controls for state and institutional characteristics. The analyses measure price in three ways: tuition and fees, room and board, and institutional grants per FTE. The purpose of three separate regression models, as outlined in Table 4.7, is to measure the effect of Bright Futures on the three dependent variables in three different ways: price after the introduction of Bright Futures, controlling for state and institutional characteristics; price for institutions with high and low concentrations of Bright Futures recipients; and price for each year of study after the introduction of Bright Futures to identify whether price varies more or less in each year after 1997. The results are summarized below and are organized according to dependent variables: tuition and fees, room and board, and institutional grants per FTE. The detailed regression results are in Appendix B.

All analyses in this section exclude institutions in the for-profit sector because fewer than 1% of all students in this sector received Bright Futures awards. Institutions in the for-profit sector were found to have on average only 12 award recipients annually. Therefore, an analysis of the effect of Bright Futures on these institutions is not possible.

Table 4.7
Description of Regression Models for each Sector and Dependent Variable

Model I--STATE & INSTITUTION CONTROLS	Model II--SCHOLARSHIP CONCENTRATION	Model III--TIMING
State-level variables:	State-level variables:	State-level variables:
State unemployment (continuous)	State unemployment (continuous)	State unemployment (continuous)
Log of state per-capita income (continuous)	Log of state per-capita income (continuous)	Log of state per-capita income (continuous)
State educational attainment level (continuous)	State educational attainment level (continuous)	State educational attainment level (continuous)
State postsecondary capacity (continuous)	State postsecondary capacity (continuous)	State postsecondary capacity (continuous)
Institution-level variables:	Institution-level variables:	Institution-level variables:
Barron's rating (dummy coded, 1, 0, six categories) (dummy coded, 1, 0, six categories)	Barron's rating (dummy coded, 1, 0, six categories) (dummy coded, 1, 0, six categories)	Barron's rating (dummy coded, 1, 0, six categories)
Endowment size per FTE (continuous)	Endowment size per FTE (continuous)	Endowment size per FTE (continuous)
Appropriations per FTE (continuous)	Appropriations per FTE (continuous)	Appropriations per FTE (continuous)
Carnegie classification (dummy coded, 1, 0, ten categories)	Carnegie classification (dummy coded, 1, 0, ten categories)	Carnegie classification (dummy coded, 1, 0, ten categories)
Fixed-effects	Fixed-effects	Fixed-effects
Years (1993 - 2000)	Years (1993 - 2000)	Years (1993 - 2000)
Bright Futures variables:	Bright Futures variables:	Bright Futures variables:
Florida (dummy coded, 1, 0)	Florida (dummy coded, 1, 0)	Florida (dummy coded, 1, 0)
Florida x After (interaction for Florida and After)	High Futures	Florida x 1997
	High Futures x After	Florida x 1998
	Low Futures	Florida x 1999
	Low Futures x After	Florida x 2000

Note: Each regression model is used separately for each applicable sector for each of the dependent variables, tuition and fees, room and board, and institutional grants.

Tuition and Fees

Public four-year institutions. In Table 4.8 the regression results are summarized for public four-year institutions after controlling for state and institutional characteristics as well as year fixed-effects (Models 1 through 3). Model 1 shows that the coefficients for both *Florida* and the interaction between *Florida* and *After* are statistically significant in the analyses of public four-year institutions after controlling for other variables.

Table 4.8
Response to Bright Futures by Florida Public Four-Year Colleges Relative to the Southeast Control Group

	Tuition and Fees			Room and Board		
	After BF Model 1	Concen-tration Model 2	Year Model 3	After BF Model 4	Concen-tration Model 5	Year Model 6
Independent Variables						
Florida	-0.442 *		-0.441 *	-0.043		-0.044
Florida x after	0.128 *			0.075 *		
High BF Concentration		-0.442 *			0.010	
Low BF Concentration		-0.442 *			-0.119 *	
High BF Concentration x after		0.122			0.095 *	
Low BF Concentration x after		0.132 *			0.058	
Florida x 1997			0.050			0.055
Florida x 1998			0.051			0.079
Florida x 1999			0.248 *			0.059
Florida x 2000			0.178 *			0.108 *
R-squared	0.732	0.732	0.734	0.609	0.618	0.609
N of observations	666	666	666	572	572	572

Note: An asterisk (*) indicates significance at the $p < .05$ level.
All models include fixed-effects for years and controls for state characteristics such as state per capita income, state unemployment rate, state postsecondary capacity, and the percent of the population with a bachelor's degree. Controls for institutional characteristics include appropriations per FTE, endowment per FTE, Carnegie classification, and Barron's selectivity rating.
Control group excludes Florida competitor institutions and institutions from states that introduced a merit-based aid program before or during the study period.
Analysis of institutional grants excluded to due to small sample size.
See Appendix B1 and B2 for more detailed regression results.

Source: Analyses of IPEDS: 1993-2000

The results in Model 1 indicate that tuition and fees were 44.2% lower in Florida than in the Southeast before Bright Futures was introduced, but only 31.4% lower than the Southeast control group of public four-year institutions after the introduction of Bright Futures.

In Model 2, when the Florida institutions are divided into two groups based on high and low concentrations of scholarship recipients, the results indicate that tuition and fees at public four-year institutions in Florida with high concentrations of recipients was 44.2% lower than at the public four-year institutions in the Southeast after controlling for other variables both before and after Bright Futures. However, tuition and fees at public four-year institutions in Florida with low concentrations of recipients were 44.2% lower than the Southeast institutions before Bright Futures was implemented, but only 31.0% lower after Bright Futures was implemented.

Model 3 tests whether the difference in tuition and fees between Florida institutions and the Southeast institutions varied by each year after the introduction of Bright Futures. Again Table 4.8 shows that tuition and fees were 44.1% lower at Florida institutions before the introduction of Bright Futures. But, the gap in tuition and fees between Florida and Southeast institutions was smaller in 1999 and 2000 than in other years. Tuition and fees were 19.3% lower in Florida than in the Southeast in 1999 and 26.3% lower in Florida than in the Southeast in 2000. These results indicate that in 1999 and 2000 tuition and fees increased in public four-year institutions in Florida relative to the public four-year institutions in the Southeast control group.

To test the robustness of the results I ran the same regression analyses with the U.S. control group and found that public four-year institutions in Florida had lower

tuition and fees relative to the U.S. control group throughout the study period (approximately 47% lower) and that the gap in tuition and fees between Florida and the U.S. control group did not change with the introduction of Bright Futures. Detailed results are in Appendix C1.

Private four-year institutions. In Table 4.9 the regression results are summarized comparing Florida with the Southeast control group for private four-year institutions after controlling for state and institutional characteristics as well as year fixed-effects. Table 4.9 shows few statistically significant predictors of tuition and fees (Models 1 through 3) for the private four-year sector. Model 1 shows that tuition and fees were no different at private four-year institutions in Florida compared with the Southeast control group after controlling for other variables and that this relationship was comparable before and after the Bright Futures program was introduced. Model 2 shows that Florida institutions with high concentrations of Bright Futures recipients had tuition and fees 36.0% higher than institutions in the Southeast both before and after the introduction of Bright Futures. Model 3 indicates that tuition and fees were comparable at private four-year institutions in Florida compared with private four-year institutions in the Southeast regardless of year.

To test the robustness of the results, I ran the same regression analyses with the U.S. control group. The results show that, with one exception, tuition and fees in private four-year institutions were comparable in Florida and the U.S. control group throughout the study period after controlling for other variables. The one exception is that private four-year institutions in Florida with low concentrations of scholarship recipients had

Table 4.9
Response to Bright Futures by Florida Private Four-Year Colleges Relative to the Southeast Control Group

	Tuition and Fees			Room and Board			Institutional Grants per FTE		
	After BF Model 1	Concen-tration Model 2	Year Model 3	After BF Model 4	Concen-tration Model 5	Year Model 6	After BF Model 7	Concen-tration Model 8	Year Model 9
Independent Variables									
Florida	0.119		0.126	0.115		0.115	-0.993		-1.220
Florida x after	-0.024			0.015			-0.003		
High BF Concentration		0.360 *			0.287 *			-0.821	
Low BF Concentration		-0.013			-0.335 *			-0.830	
High BF Concentration x after		-0.126			0.055			0.238	
Low BF Concentration x after		0.038			-0.016			-0.227	
Florida x 1997			-0.031			0.037			0.059
Florida x 1998			-0.074			-0.001			-0.020
Florida x 1999			0.031			0.012			-0.101
Florida x 2000			-0.037			0.018			-0.208
R-squared	0.952	0.959	0.953	0.927	0.969	0.927	0.944	0.949	0.945
N of observations	150	150	150	125	125	125	69	69	69

Note: An asterick (*) indicates significance at the p< .05 level.
All models include fixed effects for years and controls for state characteristics such as state per capita income, state unemployment rate, state postsecondary capacity, and the percent of the population with a bachelor's degree. Controls for institutional characteristics include appropriations per FTE, endowment per FTE, Carnegie classification, and Barron's selectivity rating.
Control group excludes Florida competitor institutions and institutions from states that introduced a merit-based aid program before or during the study period.
See Appendices B3 - B5 for more detailed regression results.

Source: Analyses of IPEDS: 1993-2000

24.6% lower tuition and fees than those in the U.S. control group throughout the study period. The analyses also show that the introduction of Bright Futures did not result in statistically significant differences in tuition and fees between private four-year institutions in Florida and U.S. private four-year institutions. Detailed results are in Appendix C3.

Public two-year institutions. In Table 4.10 the regression results are summarized for public two-year institutions in Florida compared with the Southeast, controlling for state and institutional characteristics as well as year fixed-effects. Model 1 shows that tuition and fees in Florida were 64.4% lower in public two-year institutions in Florida compared with public two-year institutions in the Southeast before the introduction of Bright Futures. But, Model 1 also indicates that, after the introduction of Bright Futures, the gap in tuition and fees between public two-year institutions in Florida and in the Southeast was smaller (64.4% before vs. 5.6% after).

Model 2 shows that tuition and fees were lower at public two-year institutions in Florida with high concentrations of Bright Futures recipients (58.4% lower) before the introduction of Bright Futures, and 70.5% lower at public two-year institutions in Florida with low concentrations of Bright Futures recipients before the introduction of Bright Futures. But, the gap in tuition and fees was smaller after the introduction of Bright Futures than before. After the introduction of Bright Futures, tuition and fees were 11.5% lower at Florida institutions with high concentrations of Bright Futures recipients after the introduction of Bright Futures compared with 58.4% lower before Bright Futures was implemented. At Florida institutions with low concentrations of recipients,

Table 4.10
Response to Bright Futures by Florida Public Two-Year Colleges Relative to the Southeast Control Group

	Tuition and Fees		
	After BF Model 1	Concen-tration Model 2	Year Model 3
Independent Variables			
Florida	-0.644 *		-0.649 *
Florida x after	0.588 *		
High BF Concentration		-0.584 *	
Low BF Concentration		-0.705 *	
High BF Concentration x after		0.469 *	
Low BF Concentration x after		0.708 *	
Florida x 1997			0.435 *
Florida x 1998			0.525 *
Florida x 1999			0.758 *
Florida x 2000			0.711 *
R-squared	0.609	0.783	0.784
N of observations	1,442	1,442	1,442

Note: An asterisk (*) indicates significance at the $p < .05$ level.
All models include fixed-effects for years and controls for state characteristics such as state per capita income, state unemployment rate, state postsecondary capacity, and the percent of the population with a bachelor's degree. Controls for institutional characteristics include appropriations per FTE, endowment per FTE, Carnegie classification, and Barron's selectivity rating.
Control group excludes Florida competitor institutions and institutions from states that introduced a merit-based aid program before or during the study period.
Analysis of institutional grants and room and board not performed because they are not typically offered.
See Appendix B6 for more detailed regression results.

Source: Analyses of IPEDS: 1993-2000

tuition and fees were on par with the Southeast after Bright Futures was implemented but 70.5% lower before Bright Futures was implemented.

Model 3 shows that tuition and fees were 64.9% lower at public two-year institutions in Florida than public two-year institutions in the Southeast control group before the introduction of Bright Futures. But, the relationship was different in the years after the introduction of Bright Futures. After controlling for other variables, tuition and fees were 21.4% lower in Florida than in the Southeast in 1997, 12.4% lower in 1998, 10.9% higher in 1999, and 6.2% higher in 2000.

To test the robustness of the results I ran the same regression analyses with the U.S. control group and found that tuition and fees in public two-year institutions in Florida were 35.1% lower than public two-year institutions in the U.S. control group throughout the study period, controlling for other variables. Institutions with both high and low concentrations of Bright Futures recipients had lower tuition and fees in Florida than in the U.S. control group (21.9% and 48.3%, respectively). After the introduction of Bright Futures, the gap in tuition and fees between public two-year institutions in Florida with low concentrations of Bright Futures recipients and those in the U.S. control group closed to 23.4% lower in Florida than those in the U.S. control group Detailed results are presented in Appendix 6.

Room and Board

Public four-year institutions. In Table 4.8 the regression results are summarized for room and board rates in public four-year institutions, controlling for state and institutional characteristics, as well as for year fixed-effects (Models 4 through 6). Model

4 indicates that there is no statistically significant difference in room and board rates in public four-year institutions in Florida than in public four-year institutions in the Southeast control group before the introduction of Bright Futures. However, Model 4 also indicates that room and board rates were 7.5% higher in Florida than in the Southeast after the introduction of Bright Futures, controlling for other variables.

In Model 5 the Florida institutions are grouped based on high and low concentrations of scholarship recipients. Table 4.8 shows that room and board rates were 11.9% lower in public four-year institutions in Florida with low concentrations of Bright Futures recipients than in institutions in the Southeast control group, controlling for other variables before and after implementation of Bright Futures. Public four-year institutions in Florida with high concentrations of Bright Futures recipients had room and board charges that were not different from public four-year institutions in the Southeast control group before implementation of Bright Futures. But these institutions had room and board charges that were 9.5% higher than in institutions in the Southeast control group after implementation of Bright Futures.

Model 6 tests variations in the effects of Bright Futures based on each year after the program's introduction. Table 4.8 indicates that room and board rates were 10.8% higher in public four-year institutions in Florida than in public four-year institutions in the Southeast in the year 2000, controlling for state and institutional characteristics and year fixed-effects.

To test the robustness of the results, I ran the same regression analyses with the U.S. control group and found that, with one exception, public four-year institutions in Florida had comparable room and board rates relative to public four-year institutions in

the U.S. control group throughout the study period, including before and after the introduction of Bright Futures. Public four-year institutions in Florida with low concentrations of scholarship recipients had 10.5% lower room and board rates than public four-year institutions in the U.S. control group throughout the study period. Detailed results are in Appendix C2.

Private four-year institutions. In Table 4.9 the regression results are summarized for room and board rates in private four-year institutions in Florida compared with the Southeast, controlling for state and institutional characteristics as well as year fixed-effects (Models 4 through 6). Model 4 shows that room and board rates in four-year private institutions in Florida are comparable with private four-year institutions in the Southeast, with no measurable difference before or after Bright Futures was implemented. Model 5 shows that room and board rates were 28.7% higher at private four-year institutions in Florida with high concentrations of Bright Futures recipients and 33.5% lower at private four-year institutions in Florida with low concentrations of Bright Futures recipients than at private four-year institutions in the Southeast control group. But these relationships were the same before and after the Bright Futures program was implemented. Model 6 indicates that room and board rates were comparable at private four-year institutions in Florida compared with private-four-year institutions in the Southeast even in the years after Bright Futures was implemented.

To test the robustness of the results, I ran the same regression analyses with the U.S. control group. The results show that room and board rates were comparable at private four-year institutions in Florida and the U.S. control group throughout the study

period, controlling for other variables, and that the introduction of Bright Futures did not result in statistically significant differences in room and board between private four-year institutions in Florida and private four-year institutions in the U.S. control group. Private four-year institutions in Florida with high concentrations of scholarship recipients had 23.0% higher room and board rates than private four-year institutions in the U.S. control group throughout the study period. Detailed results are in Appendix C4.

Institutional Grants

Private four-year institutions. In Table 4.9 the regression results are summarized for institutional grants per FTE in private four-year institutions in Florida compared with the Southeast, controlling for state and institutional characteristics as well as year fixed-effects (Models 7 through 9). Model 7 shows no difference in institutional grants per FTE in private four-year institutions in Florida compared with private four-year institutions in the Southeast before or after the introduction of Bright Futures. Model 8 shows no difference in institutional grants per FTE in private four-year institutions in Florida compared with in the Southeast control group regardless of the institutional concentration of scholarship recipients. These relationships are comparable before and after Bright Futures implementation. Model 9 shows no difference in institutional grants per FTE for private four-year institutions in Florida and in the Southeast and no variation in this relationship in the years after the introduction of Bright Futures. The lack of differences for institutional grants per FTE in this sector may be the result of small sample sizes. The analysis includes only 69 institutions.

To test the robustness of the results, I ran the same regression analyses with the U.S. control group. The analyses show that institutional grants per FTE were comparable at private four-year institutions in Florida and the U.S. control group throughout the study period, controlling for other variables. The introduction of Bright Futures was not associated with statistically significant differences in institutional grants between private four-year institutions in Florida and private four-year institutions in the U.S. control group. Private four-year institutions in Florida with low concentrations of Bright Futures scholarship recipients received 69.2% fewer institutional grants per FTE than private four-year institutions in the U.S. control group throughout the study period. Detailed results are in Appendix C5.

Summary

Tuition and fees were lower on average for both public four-year and public two-year institutions in Florida than in both the Southeast and U.S. control groups. Private four-year tuition and fee rates were higher on average in Florida than in the Southeast but lower on average in Florida than in the United States. Differences in tuition and fees between Florida and the U.S. comparison groups in the for-profit sector varied in the 1990s. Tuition and fees were consistently higher at Florida for-profit institutions than at Southeast for-profit institutions.

Descriptive analyses revealed differences in the annual change in tuition and fees between Florida and the control groups and differences in the direction of the changes before and after the implementation of Bright Futures. In the public four-year and public two-year sectors, tuition and fees generally decreased in Florida, whereas they increased

in the control groups before the introduction of Bright Futures. After the introduction of Bright Futures, tuition and fees generally increased by a larger percentage in Florida than in the control groups.

After controlling for other variables, tuition and fees were lower in public four-year institutions in Florida relative to the Southeast (-44.2%) before Bright Futures. After Bright Futures, tuition and fees in this sector were only 31.4% lower in Florida than in the Southeast and the annual increase in tuition and fees in public four-year institutions in Florida was most pronounced in 1999 and 2000. The regression analyses also show that room and board rates in public four-year institutions were comparable in Florida and the Southeast before Bright Futures was introduced, controlling for other price predictors. However, room and board rates were 3.2% higher in Florida than in the Southeast after Bright Futures was introduced. This increase was most pronounced in institutions with high concentrations of scholarship recipients.

The regression analyses in the public two-year sector show that, even controlling for state and institutional variables, Florida had 64.4% lower prices than public two-year institutions in the Southeast before Bright Futures but only 5.6% lower after Bright Futures. The regression results also show that, in each year that the Bright Futures program was in effect, tuition and fees in public two-year institutions in Florida were higher than in the Southeast control group.

The regression analyses in the private four-year sector show no difference in tuition and fees in Florida relative to the Southeast, before or after the introduction of Bright Futures. Similarly, in the private four-year sector, room and board rates were comparable in Florida and the Southeast, controlling for state and institutional

characteristics, both before and after the introduction of Bright Futures. Regression analyses also indicate that there were no differences in institutional grants per FTE between private four-year institutions in Florida relative to the Southeast, controlling for state and institutional characteristics before or after the introduction of Bright Futures.

The final chapter of this study draws conclusions about state merit-based financial aid in Florida based on the findings. Implications of the findings for policymakers are identified along with recommendations for further research.

CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

CHAPTER 5

Introduction

This study extended two bodies of research, one that analyzes institutional price response to student financial aid and a second that examines the effect of state merit-based aid programs on institutions, by examining changes in tuition and fees, room and board charges and institutional aid expenditures following the introduction of the Bright Futures merit-based aid program in Florida. Applying an economic theoretical framework to postsecondary education pricing, this study explored how institutions respond to the introduction of a new aid subsidy and how this response varies for different types of postsecondary institutions. Using descriptive and ordinary least squares regression analyses that include year fixed-effects and other controls, this study used institution-level data for the 1993-1994 to 2000-2001 academic years from the Integrated Postsecondary Education Data System (IPEDS) and the Florida Bright Futures program to explore the following research questions for four sectors of postsecondary education (public four-year, public two-year, private four-year, and for-profit institutions):

1. How do tuition and fee charges, room and board charges, and grant aid expenditures at Florida colleges and universities compare with those at institutions in other states?
2. How do annual changes in tuition and fee charges, room and board charges, and grant aid expenditures at Florida colleges and universities compare with annual

changes at institutions in other states after the introduction of the Bright Futures merit-based aid program?

3. Relative to a comparison group of institutions in other states, how do tuition and fee charges, room and board charges, and grant aid expenditures at Florida colleges and universities react to the introduction of the state merit-based aid program, controlling for institutional and state economic characteristics?

The first section of this chapter summarizes the findings of this study for each sector. The second section summarizes the results and highlights key conclusions. The final section of the chapter presents the implications of the study and suggests directions for future policy and research.

Summary of Findings by Sector

The research findings are summarized by sector. More specifically, the results are summarized across research questions and across dependent variables for each of four institutional sectors: public four-year, public two-year, private four-year, and for-profit institutions.

Prices in Institutions in the Public Four-Year Sector

Analyses of prices in the public four-year sector show that, on average, tuition and fees from 1993 to 2000 were lower in Florida than in the Southeast and U.S control groups, but room and board rates were higher in Florida than in the Southeast and U.S. control groups. The descriptive analyses indicate that the average tuition and fees in the public four-year sector were 25.8% to 36.9% lower in Florida relative to the Southeast control group, and even lower in Florida relative to the United States (32.5% to 43.3%

lower). This finding is consistent with Florida's historic commitment to a low tuition policy in the public sector. In contrast, average room and board rates in the public four-year sector were higher in Florida relative to both the Southeast control groups (5.6% to 9.6%) and the U.S. control group (1.3% to 6.8%). Higher average room and board rates suggest that, although public four-year institutions in Florida kept tuition and fee charges low, these institutions may have compensated by gaining additional revenues through higher room and board charges.

Further descriptive analyses show that annual percentage changes in the price of public four-year institutions varied after the introduction of Bright Futures. From 1993 to 1996, public four-year institutions in Florida decreased tuition and fees in constant dollars, while institutions in the Southeast and United States increased theirs. After the 1997 introduction of Bright Futures, tuition and fees increased annually at a higher rate in public four-year institutions in Florida relative to the Southeast in 1997 (4.5% vs. 2.9%) and in 1999 (9.7% vs. 1.2%), as well as relative to the United States in 1999 (9.7% vs. 2.6%). Annual percentage changes in room and board rates were comparable in Florida and the control groups throughout the study years. These results suggest that, although Florida kept tuition and fees low compared to the Southeast before Bright Futures, in two of the four years after the introduction of Bright Futures, tuition and fees in Florida in the public four-year sector increased at a faster rate.

The regression analyses measure the extent to which the differences identified in the descriptive analyses are still present, controlling for state and institutional characteristics that might explain the observed variation in prices. The results confirm that, after controlling for other variables, tuition and fees were still lower in public four-

year institutions in Florida relative to the Southeast (-44.2%) before Bright Futures. After Bright Futures, tuition and fees in this sector were only 31.4% lower in Florida than in the Southeast. These results suggest that the introduction of Bright Futures was associated with an increase in tuition and fees in the public four-year sector in Florida. Furthermore, the regression results indicate that the change in tuition and fees was most pronounced in institutions with low concentrations of Bright Futures recipients. This finding suggests that perhaps other factors besides Bright Futures drove the price change in Florida relative to the Southeast. If the flow of Bright Futures dollars caused the price change, the change in prices should be present in institutions with the highest concentration of scholarship recipients. The regression results also showed that the annual increase in tuition and fees in public four-year institutions in Florida was most pronounced in 1999 and 2000. This result suggests that, as the numbers of scholarship recipients grew, the gap in tuition and fees in public four-year institutions in Florida diminished relative to the Southeast. This finding also suggests that the increase in price associated with Bright Futures was delayed, occurring three years after the program began.

The regression analyses also show that room and board rates in public four-year institutions were comparable in Florida and the Southeast before Bright Futures was introduced, controlling for other price predictors. However, room and board rates were 3.2% higher in Florida than in the Southeast after Bright Futures was introduced. This increase was most pronounced in institutions with high concentrations of scholarship recipients. These results suggest that the introduction of Bright Futures was associated with an increase in room and board charges at public four-year institutions in Florida.

Furthermore, the regression results indicate that the difference in room and board rates was most pronounced in 2000 when room and board rates in public four-year institutions were 6.4% higher in Florida than other Southeast institutions.

The results of the regression analyses comparing Florida with the United States suggest that Bright Futures was unrelated to price changes in the public four-year sector. The only difference in price between Florida and four-year public institutions in the Unites States was in room and board rates in institutions with low concentrations of scholarship recipients before Bright Futures (Florida had 10.5% lower room and board rates relative to the rest of the United States). If low scholarship concentration is a proxy for academic quality of the student body, this finding simply suggests that lower room and board rates were present in public four-year institutions of lower academic quality in Florida than in other institutions in the United States.

Prices in Institutions in the Public Two-Year Sector

Descriptive analyses of public two-year institutions show that tuition and fees were lower in Florida than in the Southeast (by 12.9% to 21.8%) and the United States (by 25.9% to 39.5%) from 1993 to 2000. Descriptive analyses also show that, before Bright Futures was introduced, tuition and fees annually decreased from 1993 to 1995 in public two-year institutions in Florida but increased in both the Southeast and U.S. control groups. However, in the years after Bright Futures was introduced public two-year institutions in Florida annually increased tuition and fees at a higher rate than both the Southeast (in 1997 and 1998) and the United States (in 1996 to 1999). The descriptive analyses indicate that, like public four-year institutions, public two-year institutions in

Florida have historically kept a low tuition policy. The annual increases in tuition and fees after Bright Futures indicates that this sector increased prices at a faster rate than the Southeast and the U.S. control groups did.

The regression analyses confirm that, even controlling for state and institutional variables, public two-year institutions in Florida had 64.4% lower prices than public two-year institutions in the Southeast before Bright Futures but only 5.6% lower after Bright Futures. This finding suggests that increases in price in public two-year institutions in Florida was associated with the introduction of Bright Futures. The increase in tuition was present in institutions with both high and low concentrations of scholarship recipients but most pronounced in those with low concentrations. The regression results also show that, in each year that the Bright Futures program was in effect, tuition and fees increased at a faster rate than in the Southeast control group. Tuition and fees were 21.4% lower in Florida relative to the Southeast in 1997, 12.4% lower in 1998, 10.9% lower in 1999, and just 6.2% lower in 2000, suggesting that tuition and fees at public two-year institutions in Florida annually grew to be on a par with the control group. No significant differences were found in this sector's tuition and fees relative to the United States before or after Bright Futures.

Prices in Institutions in the Private Four-Year Sector

Descriptive analyses of the private four-year sector show that prices were higher in Florida than in the Southeast (4.9% to 9.2% higher tuition and fees and 5.2% to 11.3% higher room and board rates) but lower in Florida than in the United States (11.3% to 15.0% lower tuition and fees and 3.8% to 7.9% lower room and board rates). However,

annual percentage changes in both tuition and fees and room and board rates were comparable for institutions in Florida and institutions in both the Southeast and the U.S. control groups between 1993 and 2000.

A descriptive analysis examining institutional grants per full-time equivalent enrollment (FTE) in the private four-year sector shows that the level of grants was lower in Florida than in the Southeast (9.3% to 28.3% lower) and the United States (12.7% to 20.9% lower), with the exception of one year, 1995. However, annual percentage changes in grants per FTE were comparable in Florida and in private four-year institutions in both the Southeast and the United States. Thus the results of the descriptive analyses suggest that, on average, private four-year institutions in Florida charged higher prices but offered lower grant aid relative to the Southeast both before and after implementation of Bright Futures. And Florida had lower prices and lower grant aid relative to the U.S. control group in the private four-year sector.

Controlling for state and institutional characteristics, the regression analyses show no difference in tuition and fees in private four-year institutions in Florida relative to the Southeast, before or after the introduction of Bright Futures. Similarly, Florida institutions with both high and low concentrations of scholarship recipients had comparable tuition and fees as institutions in the Southeast before and after the introduction of Bright Futures. These results suggest that, in the private four-year sector, Bright Futures had no effect on tuition and fees, even though the private sector had more flexibility than the public sector in adjusting prices at the time Bright Futures was introduced.

Although no increase in tuition and fees was indicated after Bright Futures, the regression results did show that private four-year institutions in Florida with high concentrations of scholarship recipients had tuition and fees that were 36.0% higher than institutions in the Southeast. This finding suggests that there may be a selection effect in which scholarship recipients attend higher-priced institutions. If scholarship recipients are better students academically, and if price is a proxy for academic quality (Zhang, 2004), the results indicate that higher-achieving students attend higher-priced/quality schools.

Similar to the pattern for tuition and fees in the private four-year sector, room and board rates were comparable in Florida and the Southeast, controlling for state and institutional characteristics, both before and after the introduction of Bright Futures. However, before Bright Futures was introduced, private four-year institutions with high concentrations of recipients had room and board rates that were 28.7% higher than in the Southeast, whereas institutions with low concentrations had room and board rates that were 33.5% lower than in the Southeast. If we assume that scholarship concentration is associated with the academic quality of students enrolled the institutions, these findings may indicate that higher-quality institutions charged higher prices and lower-quality institutions charged lower prices.

The regression analyses also indicate that there were no differences in institutional grants per FTE between private four-year institutions in Florida relative to the Southeast, controlling for state and institutional characteristics before or after the introduction of Bright Futures. The results of the regression analyses that compared Florida with the United States revealed no differences in price (tuition and fees and room and board) or institutional grants per FTE in the private four-year sector before or after

the introduction of Bright Futures. Private four-year institutions in Florida with high concentrations of scholarship recipients had room and board rates that were 23.0% higher than the private four-year institutions in the U.S. control group. But this result may again simply indicate that the concentration variable is a proxy for academic quality of students, and, in the private four-year sector, higher-quality institutions average higher room and board rates.

Prices in Institutions in the For-Profit Sector

Only descriptive analyses were conducted for for-profit institutions because of the low participation rates of this sector in the Bright Futures program. Furthermore, the price differences in the descriptive analysis must be interpreted with caution because of the rapid change in this sector. To maintain the sample size, the tuition and fees variable for this sector is defined differently from the other three sectors. Tuition and fees are defined as the price of full-time full-year attendance in the largest program offering. The largest program may vary from year to year for the institution. Regardless, the results indicate that tuition and fees were higher at for-profit institutions in Florida than in the Southeast each year (from 4.1% higher to 21.8% higher). The annual percentage change in tuition and fees varied not only across the years but also between institutions in Florida and the Southeast and U.S. for-profit institutions.

Conclusions

This study's findings contribute to two bodies of research, one that analyzes institutional price response to student financial aid and a second that examines the effect

of state merit-based aid programs on institutions. The results inform research on price response by testing price differences in a treatment group compared with a control group. This quasi-natural experimental design is a more precise way of testing price response than the research designs used in previous price response studies (Acosta, 2001; Li, 1999; McPherson & Schapiro, 1991, 1993). The results inform research on merit-based aid programs by extending the analysis of price response to the subsidy in a previously unstudied state, Florida. Based on the findings of this study, two main conclusions may be drawn. First, the introduction of Bright Futures was associated with an increase in price in public-sector institutions. Second, the introduction of Bright Futures was not associated with changes in prices in the private four-year sector.

With regard to the public sector change in price: After the introduction of Bright Futures, in the public four-year institutions the gap in tuition and fee charges between Florida and the Southeast decreased by 12.8%, and the change was most pronounced in the last two years of the study (a 24.8% smaller gap in 1999 and a 17.8% smaller gap in 2000). Room and board rates were also 7.5% higher after the introduction of Bright Futures in the public four-year sector, with the greatest increases in room and board rates at public four-year institutions in Florida with high concentrations of scholarship recipients. Similarly, in the public two-year sector, tuition and fees in Florida were far below those in the Southeast before the introduction of Bright Futures (64.4% lower) but only 5.6% lower in Florida than in the Southeast after the introduction of Bright Futures, controlling for other variables. The regression analyses show that public two-year tuition and fees in Florida moved from 21.4% lower in Florida than the Southeast in 1997, to 12.4% lower in Florida than in the Southeast in 1998, to 10.9% higher in Florida than in

the Southeast in 1999, and 6.2% higher in Florida than the Southeast in 2000. Also, public two-year institutions with both high and low concentrations of Bright Futures recipients increased their prices after Bright Futures was introduced.

Although the findings show that tuition and fees increased at public four-year institutions in Florida relative to institutions in the Southeast after the introduction of Bright Futures, some caution is warranted. Specifically, this conclusion is uncertain because the analyses show no significant difference in price for Florida public four-year institutions with high concentrations of scholarship recipients compared with Southeast institutions. Similarly, in the public two-year sector, although the price increase relative to the Southeast was evident in institutions with both low and high concentrations of recipients, it was most pronounced in the institutions with low concentrations of scholarship recipients.

These findings may indicate that other explanations that are not controlled for in the model account for the differences in price response related to recipient concentration. Some possible explanations identified in the economic theoretical literature on price-setting (Blais & Dion, 1991; Clotfelter, 1996; McPherson & Schapiro, 1993; Winston, 1999) suggest that institutions may become more selective as an alternative to raising their prices. The trade-off between price and selectivity in response to student demand is dependent upon the goals and objectives of the institutions and its orientation toward academic quality (Clotfelter, 1996; Winston, 1999). Particularly in highly selective institutions in which the number of seats is stagnant, institutions may be more likely to seek students with higher academic qualifications to raise the prestige of their institution through commonly used college rankings (Clotfelter, 1996). Theorists (Rothschild &

White, 1995) also suggest that increasing the academic quality of students is a desirable choice because better academically prepared students add to what the institution can offer in terms of peer quality of the student body.

In Florida, tuition and fees are set by state policymakers in the public sector, but institutions have discretion to become more selective in response to a growing applicant pool and institutions have discretion to set room and board rates. If Bright Futures resulted in an increase of student applicants at Florida's public institutions, then institutions may have responded by choosing better academically qualified students. Public four-year institutions in Florida with high concentrations of Bright Futures students are by definition academically more selective institutions. Thus these institutions would have been more likely to respond to the increasing flow of scholarship recipients by being even more academically selective rather than by increasing their price. This study does not control for changes in student-level academic achievement during the study period, but only institution-level measures of selectivity, wealth, and mission, such as Barron's rating, endowment, and Carnegie classification.

Another explanation for the increase in price in the public sector may be that Florida had such extremely low tuition rates among U.S. states, policymakers may have simply been motivated to close the tuition and fee gap between it and surrounding states. The notion of lagging tuition rates being equated with lagging quality is a view that recently drove Florida House legislators to increase tuition and fees (by 40% by 2010) to improve the perceived quality of the Florida public system of higher education (*Tallahassee Bureau*, May 3, 2007). If Bright Futures recipients selected higher-quality higher-priced institutions while avoiding lower-priced lower-quality institutions, the

increase in price in the institutions with a low-concentration of Bright Futures recipients may truly correlate with a direct policy change in price and not with the increase in Bright Futures scholarship revenue to those institutions. Institutional and state policymakers typically use peer institutions as benchmarks to make decisions about price (Clotfelter, 1996; Mumper, 2001), therefore the surrounding postsecondary market may have pressured the low relative position of Florida's public sector prices upward if policymakers and students had the impression that Florida institutions were under-price.

With regard to the private four-year sector, the analyses show that these Florida institutions did not change their prices after Bright Futures was introduced. However, private four-year institutions in Florida may have responded to Bright Futures by increasing the academic quality of the students that they enroll rather than by raising prices. Or the share of the price covered by the Bright Futures scholarship was so small that it had no significant effect on the institutions in Florida. The regression results show that private four-year institutions with high concentrations of scholarship recipients had tuition and fees that were 36.0% higher than those in the Southeast before Bright Futures. This finding suggests that there may have been a selection effect in which scholarship recipients concentrated mostly at higher-priced institutions. If scholarship recipients are better students academically, and if price is a proxy for academic quality, then the results may indicate that high achieving students attended higher-priced higher-quality schools. Therefore, the results suggest that the academic quality of students changed during the study period, but this change is not captured by the variables included in this study's model of pricing behavior.

With the exception of Long (2002, 2003), the results of this study can not be directly compared with previous price response research because prior studies analyzed national samples and examined federal aid subsidies. The results of this study share some similarities with Long's (2002, 2003) analyses for Georgia. Long showed that both public four-year and private four-year institutions responded to HOPE by raising tuition and fee rates. In contrast, this study shows that public four-year and public two-year institutions, but not private four-year institutions, changed tuition and fees in response to Bright Futures. Long's study indicated that the increases were more pronounced in institutions with many HOPE recipients in both the private and the public four-year sectors, but this study found that tuition and fee increases were present only in low-concentration institutions. Both this study's findings and the Long analysis for Georgia found that room and board charges increased after the merit-based aid subsidy was introduced in the public four-year college sector, and increases were present in institutions with the largest concentration of scholarship recipients. Although Long's analysis showed that institutional grant aid decreased in private four-year institutions in Georgia after HOPE was introduced, this analysis suggests that, in private four-year institutions in Florida, institutional grants were unrelated to the introduction of Bright Futures.

In summary, the findings in this study suggest that the price increase in Florida was associated with the introduction of Bright Futures in public two- and four-year institutions, but no change in price occurred in private four-year institutions. However, conclusions about causality are limited because these changes may have resulted from other forces that coincided with the introduction of Bright Futures but that were not controlled in the analyses. The quasi-natural experimental method requires that only one

treatment factor be introduced and measured during the study period. Prices at Florida institutions trended far below the national average in the first half of the study period. If institutions raised their prices in the second half of this study period because of forces related to the low position of Florida institutions relative to other institutions in the same market (and unrelated to the introduction of Bright Futures), the results of the study falsely indicate that Bright Futures was the cause of the tuition and fee increases. Despite this limitation, the current study shows a significant price increase in public sector institutions in Florida relative to the Southeast after Bright Futures was introduced, even controlling for other explanations of this relationship. In the next section implications of this study's findings and conclusions for policy are described, and directions for future research are suggested.

Implications

The implications and considerations of the findings for policymakers are described. Recommendations for state policymakers are offered along with possible directions for future research on the subject of price response and merit-based aid.

Recommendations for Policy

The results indicate that the introduction of the Bright Futures program in Florida was associated with an increase in price at public four-year and public two-year institutions in Florida, but not in private four-year institutions. Several recommendations for policy may be drawn from the findings.

First, Florida's policymakers may need to target more aid dollars toward low-income students to address the price increase associated with Bright Futures. In Florida, institutions are authorized to set room and board rates, but state policymakers are responsible for setting tuition and fees (Finney, 1997). This study, however, does not address why policymakers increased tuition and fees in response to Bright Futures. One potential explanation is that those responsible for setting prices thought that an increase in tuition and fees after the introduction of Bright Futures would be more palatable to institutional leaders and college students in the state, because the new scholarship would help to subsidize the price. Regardless of the reason for the change in price, if the introduction of a new subsidy results in price increase, the scholarship program's effectiveness at reducing net costs for students is diminished. Students who do not receive the scholarship and students who lose their scholarship because they cannot renew then face higher prices and are adversely affected by this price increase.

Prior studies on enrollment response indicated that low-income students are more sensitive to price increases than higher-income students and less likely to enroll as a result of financial constraints (Heller, 1997). Therefore, policymakers should target higher education finance policy in such a way that the price effects of merit-based aid are mitigated for low-income populations, because these groups qualify for merit-based aid at lower rates than their higher-income peers (Heller, 2002). For example, states might adjust their appropriations formulas for public institutions to financially reward institutions for enrolling lower-income students. Such a policy would offset some of the effects of the merit-based aid on enrollment. If Florida is intentionally moving from being a low-price/low-aid state toward being a high-price/high-aid state, policymakers in

Florida need to consider the adverse effects on the enrollment of low-income students in a high-price/high-aid model, and consider ways to mitigate these effects as they continue the Bright Futures program by adding need as a factor in Bright Futures award formulas and supplementing Bright Futures with additional state need-based financial aid programs.

Second, because no price response was evident in the private four-year sector, Florida's policymakers could use merit-based aid as a strategy to achieve increases in other outcomes: student academic quality, in-state retention, and affordability. In the private four-year sector only, these goals could be pursued without decreasing affordability for non-recipients in the sector. However, in this study there was no attempt to ascertain whether these other goals were in fact achieved with merit-based aid during the study period or whether other potentially adverse effects of merit-based aid did or did not occur, such as decreasing enrollment rates for disadvantaged groups.

Third, policymakers in all states should monitor the effect of state financial aid programs on prices in each sector in order to determine what portion of the state financial aid program is captured by students and what portion is captured by institutions. Although in this study focus was on Florida, policymakers in other states might conclude that state merit-based aid programs result in price increases in the public sectors, and therefore they may not be an appropriate financial aid tool for improving college affordability. If states do use merit-based financial aid programs, policymakers should also monitor and control the full set of state financial aid programs, state appropriations, tuition and fees and room and board charges in the public sectors in such a way as to minimize the potentially adverse affects of large aid programs on prices. By jointly

managing tuition and fee policy, state appropriations, and state financial aid in the public sectors, state policymakers can allocate the financial benefit of state financial aid toward students rather than toward institutions by ensuring that increases in state financial aid are not offset by decreases in appropriations or increases in prices.

Recommendations for Future Research

The results contribute to two bodies of research, one that analyzes merit aid and the other that measures price response. However, only a small set of potentially relevant responses to a merit-based aid program in just one state were examined. More analysis is needed to provide policymakers with useful information for developing effective financial aid programs. The results of this study suggest at least four directions for future research.

First, future analyses of institutional response to such subsidies as state merit-based aid programs should include measurements of student academic quality that vary over the time of the study (e.g., average college entrance scores or GPA levels of incoming first-year students). Measurements of changes in student academic quality were not included in this study because IPEDS did not consistently collect student academic performance measurements for 1993 - 2000. Therefore, the extent to which institutions responded to the Bright Futures subsidy by increasing quality rather than increasing price was not examined. Other researchers (Cornwell, Lee, & Mustard, 2005) found that the academic quality of students increased at four-year institutions in response to the introduction of the Georgia HOPE scholarship. Their study also indicated that, at the most competitive four-year institutions, application rates increased, whereas acceptance

rates declined, after the introduction of HOPE. Therefore, future studies of merit-based aid should include yearly measurements of student quality and selectivity as independent variables in order to control for institutions' choices to increase student quality instead of prices.

Second, in future research on the effect of merit-based financial aid in Florida, other institutional characteristics besides price that may change in response to Bright Futures should be considered. One of the first studies of institutional responses to the introduction of merit aid (Cornwell & Mustard, 2006) examined changes in the racial and economic diversity of institutions after the introduction of Georgia HOPE as well as changes in the academic diversity of students. Cornwell and Mustard found that Georgia institutions became more homogenous after the introduction of merit-based aid. Future research on Bright Futures should examine institutional changes other than price to understand the full effect of Bright Futures on institutions in Florida. The same differences-within-differences methodology could be employed, but enrollment rates for different racial, socio-economic and academic achievement groups should be used as dependent variables.

Third, further research on price response to a newly introduced subsidy like a state merit-based aid program should consider variations in responses of states with low tuition and fee levels compared to states with high tuition and fee levels. Florida's low prices compared to both the southeastern region and the rest of the U.S. states may have introduced other market forces into the tuition setting decisions that are not controlled for in this study. While the southeastern region functioned as a similar control group for this

study because the prices in the region were closer to Florida on average than the U.S., prices in the Florida public sector were still comparatively low.

Last, further research on price response to Bright Futures in Florida should qualitatively explore the decision-making process surrounding price-setting behaviors. Although the setting of room and board rates and grant aid expenditures were controlled by the institutions, the decision to change tuition and fees in the public sectors between 1993 and 2000 was primarily the responsibility of the Florida Board of Regents. A case study of the Florida Board of Regents and Florida State Legislature would ascertain the factors that led policymakers to authorize increases in price while simultaneously introducing a merit-based aid program that was broadly available in the state. For example, raising tuition and fees while also introducing Bright Futures canceled out some of the price-savings of the merit-based aid for students in the public sectors who received the scholarships and increased prices for nonrecipients. However, introduction of the generous merit-based aid program may have made political constituents less averse to the tuition and fees increases. Mumper's (2001) qualitative study of how policymakers formulate decisions about college prices in 11 states between 1995 and 1999 found that such decisions were rooted in the individual perspectives of policymakers on what factors drive college costs and prices. He identified state governments, public institutions themselves, the competing state financial priorities of prisons and Medicaid, and the cost of increasing institutional quality as the perceived drivers of cost and prices. A qualitative study of the postsecondary policymaking process in Florida during the study period would shed light on the forces that shaped price increases in the public sector after the introduction of the Florida Bright Futures program.

Final Comments

The literature on merit-based aid described earlier (Farrell, 2004a, 2004b; Heller & Rasmussen, 2001, 2002; Heller & Rogers, 2003; Ness & Noland, 2004) showed that merit-based aid programs do little to close the gaps in college participation within a state. Yet, these programs continue to be highly popular among state policymakers and their constituents (Dynarski, 2004). Policymakers in Florida are now struggling to financially sustain the Bright Futures program because of the growing number of recipients, the larger outlays per recipient triggered because the award formula is based on tuition rates that are increasing, and the stagnant rate of lottery sales in the state (Borg & Stranahan, 2000). Policymakers are considering substantial new fees at public institutions that would not be covered by Bright Futures in order to increase institutional revenues. Such fees would erode the financial benefit that the merit-based aid provides for its recipients.

Although merit-based aid remains popular, some states are more creatively targeting aid programs earlier in the education pipeline to expand college opportunities. Recently, Wisconsin policymakers launched a statewide college access program called the Wisconsin Covenant, focused on expanding opportunities for all eighth graders in the state who commit to being good citizens and achieving B grades (CNN.com, April 30, 2007). Although the grade requirement is a characteristic of a merit-based aid program, the timing of the aid offer increases the motivational effect of the aid on student preparation for all eligible students. The governor's proposed budget includes $10 million annually in financial aid to guarantee each eligible student a way to pay for college in-state through a combination of work-study, loans, and scholarships. This kind of

commitment to students encourages students to prepare for what is possible in their future (Bugler et al., 1999; Henry & Rubenstein, 2002).

Despite the popularity of state merit-based aid among some policymakers and their constituents, the findings from this study suggest that supporters of merit-based aid programs should be cautious in asserting that these programs improve college affordability. While there may be several different explanations for the price changes observed in Florida in this study, merit-based aid was associated with an increase in price in public sector institutions. Bright Futures directly improved the price for recipients, but at the expense of nonrecipients who faced higher prices. Therefore, policymakers should consider the appropriateness of utilizing merit-based financial aid for addressing public policy goals of college affordability and equality in college opportunity.

Appendix A. List of Florida Institutions Included in the Analytic Sample

Public 4 Year

FLORIDA AGRICULTURAL AND MECHANICAL UNIVERSITY
FLORIDA ATLANTIC UNIVERSITY-BOCA RATON
FLORIDA INTERNATIONAL UNIVERSITY
FLORIDA STATE UNIVERSITY
THE UNIVERSITY OF WEST FLORIDA
UNIVERSITY OF CENTRAL FLORIDA
UNIVERSITY OF FLORIDA
UNIVERSITY OF NORTH FLORIDA
UNIVERSITY OF SOUTH FLORIDA

Private 4 Year

BARRY UNIVERSITY
BETHUNE COOKMAN COLLEGE
CARLOS ALBIZU UNIVERSITY-MIAMI CAMPUS
CLEARWATER CHRISTIAN COLLEGE
ECKERD COLLEGE
EDWARD WATERS COLLEGE
EMBRY RIDDLE AERONAUTICAL UNIVERSITY
FLAGLER COLLEGE
FLORIDA CHRISTIAN COLLEGE INC
FLORIDA INSTITUTE OF TECHNOLOGY-MELBOURNE
FLORIDA MEMORIAL COLLEGE
FLORIDA SOUTHERN COLLEGE
HOBE SOUND BIBLE COLLEGE
INTERNATIONAL COLLEGE
JACKSONVILLE UNIVERSITY
JONES COLLEGE-JACKSONVILLE
LYNN UNIVERSITY
NORTHWOOD UNIVERSITY-FLORIDA EDUCATION CENTER
NOVA SOUTHEASTERN UNIVERSITY
PALM BEACH ATLANTIC COLLEGE-WEST PALM BEACH
RINGLING SCHOOL OF ART AND DESIGN
ROLLINS COLLEGE
SAINT JOHN VIANNEY COLLEGE SEMINARY
SAINT LEO UNIVERSITY
SAINT THOMAS UNIVERSITY
SOUTHEASTERN COLLEGE ASSEMBLIES OF GOD
STETSON UNIVERSITY
THE BAPTIST COLLEGE OF FLORIDA
TRINITY BAPTIST COLLEGE
TRINITY COLLEGE OF FLORIDA
TRINITY INTERNATIONAL UNIVERSITY
UNIVERSITY OF MIAMI
UNIVERSITY OF TAMPA
WARNER SOUTHERN COLLEGE
WEBBER COLLEGE

Source: Analyses of IPEDS: 1993-2000

Appendix A (Continued)
List of Florida Institutions Included in the Analytic Sample

Public 2 Year

ATLANTIC TECHNICAL CENTER
BREVARD COMMUNITY COLLEGE-COCOA CAMPUS
BROWARD COMMUNITY COLLEGE
CENTRAL FLORIDA COMMUNITY COLLEGE
CHARLOTTE VOCATIONAL TECHNICAL CENTER
CHIPOLA JUNIOR COLLEGE
D G ERWIN TECHNICAL CENTER
DAYTONA BEACH COMMUNITY COLLEGE
EDISON COMMUNITY COLLEGE
FLORIDA COMMUNITY COLLEGE AT JACKSONVILLE
FLORIDA KEYS COMMUNITY COLLEGE
GEORGE STONE AREA VOCATIONAL TECHNICAL CENTER
GEORGE T BAKER AVIATION SCHOOL
GULF COAST COMMUNITY COLLEGE
HILLSBOROUGH COMMUNITY COLLEGE
INDIAN RIVER COMMUNITY COLLEGE
LAKE CITY COMMUNITY COLLEGE
LAKE TECHNICAL CENTER
LAKE-SUMTER COMMUNITY COLLEGE
MANATEE COMMUNITY COLLEGE
MIAMI-DADE COMMUNITY COLLEGE
MID-FLORIDA TECH
NORTH FLORIDA COMMUNITY COLLEGE
OKALOOSA-WALTON COMMUNITY COLLEGE
PALM BEACH COMMUNITY COLLEGE
PASCO-HERNANDO COMMUNITY COLLEGE
PENSACOLA JUNIOR COLLEGE
PINELLAS TECHNICAL EDUCATION CENTER-CLEARWATER
POLK COMMUNITY COLLEGE
RADFORD M LOCKLIN TECHNICAL CENTER
SAINT JOHNS RIVER COMMUNITY COLLEGE
SAINT PETERSBURG JUNIOR COLLEGE
SANTA FE COMMUNITY COLLEGE
SARASOTA COUNTY TECHNICAL INSTITUTE
SEMINOLE COMMUNITY COLLEGE
SHERIDAN TECHNICAL CENTER
SOUTH FLORIDA COMMUNITY COLLEGE
TALLAHASSEE COMMUNITY COLLEGE
TAYLOR TECHNICAL INSTITUTE
VALENCIA COMMUNITY COLLEGE
WASHINGTON-HOLMES TECHNICAL CENTER
WILLIAM T MCFATTER TECHNICAL CENTER
WINTER PARK TECH

Source: Analyses of IPEDS: 1993-2000

Appendix A (Continued)
List of Florida Institutions Included in the Analytic Sample

For Profit

ADVANCED-BASIC HAIR DESIGN TRAINING CENTER
AMERICAN MOTORCYCLE INSTITUTE
ART INSTITUTE OF FORT LAUDERDALE
ATI HEALTH EDUCATION CENTER
ATLANTIC COAST INSTITUTE
BRADENTON BEAUTY AND BARBER ACADEMY
CAREER TRAINING INSTITUTE
CLINTON TECHNICAL INSTITUTE-MOTORCYCLE/MARINE MECH
COOPER CAREER INSTITUTE
DARLYNE MCGEES ACADEMY OF COSMETOLOGY
EDUCATION AMERICA-TAMPA TECHNICAL INSTITUTE
EURO HAIR DESIGN INSTITUTE
FASHION FOCUS HAIR ACADEMY
FLIGHT SAFETY INTERNATIONAL
FLORIDA CAREER INSTITUTE INC
FLORIDA COMPUTER AND BUSINESS SCHOOL INC
FLORIDA INSTITUTE OF TRADITIONAL CHINESE MEDICINE
FLORIDA INSTITUTE OF ULTRASOUND INC
FLORIDA METROPOLITAN UNIVERSITY-BRANDON
FLORIDA METROPOLITAN UNIVERSITY-FT LAUDERDALE
FLORIDA METROPOLITAN UNIVERSITY-LAKELAND
FLORIDA METROPOLITAN UNIVERSITY-NORTH ORLANDO
FLORIDA METROPOLITAN UNIVERSITY-PINELLAS
FLORIDA METROPOLITAN UNIVERSITY-SOUTH ORLANDO
FLORIDA METROPOLITAN UNIVERSITY-TAMPA
FLORIDA NATIONAL COLLEGE
FLORIDA STATE COLLEGE
FLORIDA TECHNICAL COLLEGE
FLORIDA TECHNICAL COLLEGE OF JACKSONVILLE INC
FORT PIERCE BEAUTY ACADEMY
HERITAGE INSTITUTE
HUMANITIES CTR INST OF ALLIED HLTH SCH OF MASSAGE
INSTITUTE OF CAREER EDUCATION
INTERNATIONAL ACADEMY OF DESIGN AND TECHNOLOGY
INTERNATIONAL ACADEMY OF HAIR DESIGN
INTERNATIONAL SCHOOL OF BEAUTY
LA BARON HAIRDRESSING ACADEMY
LA BELLE BEAUTY ACADEMY
LA BELLE BEAUTY SCHOOL
LORAINES ACADEMY INC

Source: Analyses of IPEDS: 1993-2000

Appendix A (Continued)
List of Florida Institutions Included in the Analytic Sample

For Profit (Continued)

MANHATTAN BEAUTY SCHOOL
MARGATE SCHOOL OF BEAUTY INC
MEDICAL CAREER CENTER
NEW ENGLAND INSTITUTE OF TECHNOLOGY-PALM BEACH
NORMANDY BEAUTY SCHOOL OF JACKSONVILLE
ROSS MEDICAL EDUCATION CENTER
SCHILLER INTERNATIONAL UNIVERSITY
SOUTHEASTERN ACADEMY
SOUTHERN COLLEGE
SUNCOAST SCHOOL
WEBSTER COLLEGE
WEBSTER COLLEGE INC
ITT TECHNICAL INSTITUTE
NATIONAL SCHOOL OF TECHNOLOGY INC
AVANTI HAIR TECH
CONCORDE CAREER INSTITUTE
SUNSTATE ACADEMY OF HAIR DESIGN

Source: Analyses of IPEDS: 1993-2000

Appendix B1

Coefficients, Standard Errors, and Significance for Public Four-Year Institution Response to Bright Futures Relative to the Southeast Control Group

	TUITION AND FEES - PUBLIC FOUR-YEAR											
	Model 1				Model 2				Model 3			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Bright Futures variables												
Florida	-0.442	0.039	-0.373	0.000					-0.441	-0.373	0.039	0.000
Florida x after	0.128	0.050	0.079	0.011								
High BF Concentration					-0.442	-0.257	0.056	0.000				
Low BF Concentration					-0.442	-0.286	0.050	0.000				
High BF Concentration x after					0.122	0.051	0.072	0.089				
Low BF Concentration x after					0.132	0.061	0.065	0.042				
Florida x 1997									0.050	0.016	0.077	0.513
Florida x 1998									0.051	0.016	0.077	0.511
Florida x 1999									0.248	0.078	0.079	0.002
Florida x 2000									0.178	0.056	0.078	0.022
State characteristics												
Postsecondary capacity	-1.119	8.173	-0.004	0.891	-1.108	-0.004	8.187	0.892	0.067	0.000	8.213	0.993
State annual average unemployment rate	9.644	1.140	0.382	0.000	9.646	0.382	1.142	0.000	9.862	0.390	1.141	0.000
Percentage of state residents 25 and older with BA	3.775	0.486	0.601	0.000	3.772	0.600	0.488	0.000	3.938	0.627	0.491	0.000
Log per capita income constant (2006) dollars	0.472	0.209	0.176	0.024	0.472	0.177	0.209	0.024	0.422	0.158	0.210	0.045
Institution characteristics												
Barron's Less Competitive Institutions	-0.121	0.038	-0.123	0.001	-0.121	-0.123	0.038	0.001	-0.120	-0.122	0.038	0.001
Barron's Competitive Institutions	0.005	0.036	0.007	0.880	0.005	0.007	0.037	0.881	0.007	0.009	0.036	0.852
Barron's Very Competitive Institutions	0.080	0.043	0.088	0.060	0.081	0.088	0.043	0.062	0.080	0.088	0.042	0.059
Barron's Highly Competitive Institutions	0.012	0.057	0.008	0.827	0.014	0.009	0.060	0.814	0.014	0.009	0.057	0.808
Barron's Most Competitive Institutions	0.141	0.061	0.072	0.021	0.141	0.072	0.061	0.021	0.142	0.072	0.061	0.020
Barron's Non-Competitive or Unclassified (ref.)												
Carnegie Research I	0.227	0.035	0.208	0.000	0.227	0.208	0.035	0.000	0.226	0.207	0.035	0.000
Carnegie Research II	0.335	0.059	0.140	0.000	0.333	0.139	0.063	0.000	0.335	0.139	0.059	0.000
Carnegie Doctoral I	0.189	0.037	0.121	0.000	0.190	0.121	0.037	0.000	0.189	0.121	0.037	0.000
Carnegie Doctoral II	0.146	0.030	0.117	0.000	0.146	0.117	0.031	0.000	0.147	0.118	0.030	0.000
Carnegie Masters Comprehensive I	--	--	--	--					--	--	--	--
Carnegie Masters Comprehensive II	0.135	0.045	0.069	0.003	0.136	0.069	0.045	0.003	0.134	0.068	0.045	0.003
Carnegie Baccalaureate Liberal Arts	0.280	0.042	0.163	0.000	0.280	0.163	0.042	0.000	0.279	0.163	0.042	0.000
Carnegie Baccalaureate II	-0.015	0.029	-0.014	0.605	-0.015	-0.014	0.029	0.605	-0.016	-0.015	0.029	0.574
Carnegie Associates Colleges	-0.642	0.075	-0.190	0.000	-0.642	-0.190	0.075	0.000	-0.644	-0.191	0.075	0.000
Carnegie Professional or Special Emphasis	0.386	0.081	0.115	0.000	0.387	0.115	0.081	0.000	0.383	0.113	0.081	0.000
Carnegie Unclassified (ref.)												

Note: Reference group are noted in italics for each categorical independent variable.

Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix B1 (Continued)
Coefficients, Standard Errors, and Significance for Public Four-Year Institution Response to Bright Futures Relative to the Southeast Control Group

	TUITION AND FEES - PUBLIC FOUR-YEAR											
	Model 1				Model 2				Model 3			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Log of state appropriations per FTE constant (2006) dollars	-0.113	0.016	-0.188	0.000	-0.113	-0.189	0.017	0.000	-0.112	-0.187	0.016	0.000
Log endowment per FTE constant (2006) dollars	-0.003	0.003	-0.030	0.280	-0.003	-0.030	0.003	0.282	-0.003	-0.030	0.003	0.284
Year fixed effects												
Year is 1994	0.072	0.032	0.065	0.025	0.072	0.065	0.032	0.025	0.074	0.067	0.032	0.020
Year is 1995	0.093	0.033	0.084	0.004	0.093	0.084	0.033	0.004	0.095	0.086	0.032	0.004
Year is 1996	0.079	0.034	0.071	0.019	0.079	0.071	0.034	0.019	0.079	0.071	0.034	0.019
Year is 1997	0.092	0.035	0.083	0.008	0.092	0.084	0.035	0.008	0.101	0.092	0.035	0.004
Year is 1998	0.139	0.037	0.125	0.000	0.139	0.125	0.037	0.000	0.149	0.135	0.037	0.000
Year is 1999	0.131	0.038	0.117	0.001	0.131	0.118	0.038	0.001	0.119	0.107	0.038	0.002
Year is 2000	0.173	0.038	0.156	0.000	0.173	0.156	0.038	0.000	0.171	0.154	0.039	0.000
Year is 1993 (ref.)												
R-squared	0.732				0.719				0.721			
N of observations	668				668				668			

Note: Reference group are noted in italics for each categorical independent variable.
Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix B2

Coefficients, Standard Errors, and Significance for Public Four-Year Institution Response to Bright Futures Relative to the Southeast Control Group

	ROOM AND BOARD - PUBLIC FOUR-YEAR											
	Model 4				Model 5				Model 6			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Bright Futures variables												
Florida	-0.043	-0.067	0.029	0.128					-0.044	-0.068	0.029	0.123
Florida x after	0.075	0.084	0.036	0.036								
High BF Concentration					0.010	0.012	0.036	0.783				
Low BF Concentration					-0.119	-0.123	0.042	0.005				
High BF Concentration x after					0.095	0.081	0.045	0.037				
Low BF Concentration x after					0.058	0.043	0.052	0.267				
Florida x 1997									0.055	0.031	0.055	0.321
Florida x 1998									0.079	0.045	0.055	0.157
Florida x 1999									0.059	0.034	0.057	0.299
Florida x 2000									0.108	0.062	0.056	0.054
State characteristics												
Postsecondary capacity	2.838	0.020	5.864	0.629	1.021	0.007	5.829	0.861	2.430	0.017	5.918	0.682
State annual average unemployment rate	7.794	0.585	0.816	0.000	7.854	0.590	0.808	0.000	7.797	0.586	0.820	0.000
Percentage of state residents 25 and older with BA	2.032	0.606	0.334	0.000	2.160	0.644	0.333	0.000	2.023	0.604	0.338	0.000
Log per capita income constant (2006) dollars	0.477	0.329	0.143	0.001	0.438	0.302	0.142	0.002	0.479	0.330	0.144	0.001
Institution characteristics												
Barron's Less Competitive Institutions	-0.051	-0.102	0.037	0.170	-0.055	-0.109	0.037	0.139	-0.051	-0.102	0.037	0.174
Barron's Competitive Institutions	-0.033	-0.084	0.036	0.370	-0.031	-0.079	0.036	0.396	-0.032	-0.084	0.036	0.374
Barron's Very Competitive Institutions	-0.011	-0.023	0.040	0.792	-0.027	-0.058	0.040	0.503	-0.010	-0.022	0.040	0.798
Barron's Highly Competitive Institutions	0.051	0.068	0.048	0.291	0.008	0.010	0.050	0.878	0.052	0.069	0.049	0.284
Barron's Most Competitive Institutions	0.007	0.007	0.049	0.883	0.001	0.001	0.049	0.988	0.007	0.008	0.049	0.879
Barron's Non-Competitive or Unclassified (ref.)												
Carnegie Research I	0.097	0.175	0.027	0.000	0.091	0.164	0.026	0.001	0.097	0.173	0.027	0.000
Carnegie Research II	0.073	0.062	0.038	0.053	0.144	0.123	0.042	0.001	0.073	0.062	0.038	0.053
Carnegie Doctoral I	0.090	0.117	0.024	0.000	0.085	0.111	0.024	0.000	0.090	0.117	0.024	0.000
Carnegie Doctoral II	0.077	0.118	0.020	0.000	0.086	0.132	0.020	0.000	0.077	0.118	0.020	0.000
Carnegie Masters Comprehensive I	--	--	--	--								
Carnegie Masters Comprehensive II	0.035	0.037	0.029	0.225	0.027	0.028	0.029	0.350	0.035	0.037	0.029	0.228
Carnegie Baccalaureate Liberal Arts	0.053	0.063	0.028	0.057	0.056	0.067	0.028	0.041	0.052	0.062	0.028	0.060
Carnegie Baccalaureate II	-0.009	-0.016	0.020	0.657	-0.010	-0.018	0.020	0.605	-0.009	-0.017	0.020	0.642
Carnegie Associates Colleges	--	--	--	--								
Carnegie Professional or Special Emphasis	--	--	--	--								
Carnegie Unclassified (ref.)												

Note: Reference group are noted in italics for each categorical independent variable.

Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix B2 (Continued)
Coefficients, Standard Errors, and Significance for Public Four-Year Institution Response to Bright Futures Relative to the Southeast Control Group

	ROOM AND BOARD - PUBLIC FOUR-YEAR											
	Model 4				Model 5				Model 6			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Log of state appropriations per FTE constant (2006) dollars	-0.055	-0.105	0.021	0.010	-0.039	-0.076	0.021	0.065	-0.054	-0.104	0.021	0.011
Log endowment per FTE constant (2006) dollars	0.002	0.033	0.002	0.359	0.002	0.031	0.002	0.396	0.002	0.034	0.002	0.350
Year fixed effects												
Year is 1994	0.047	0.081	0.022	0.032	0.047	0.080	0.022	0.032	0.047	0.081	0.022	0.033
Year is 1995	0.050	0.085	0.022	0.026	0.049	0.084	0.022	0.027	0.050	0.085	0.022	0.027
Year is 1996	0.041	0.069	0.023	0.079	0.039	0.066	0.023	0.091	0.041	0.069	0.023	0.079
Year is 1997	0.049	0.084	0.024	0.041	0.047	0.081	0.024	0.048	0.051	0.088	0.024	0.036
Year is 1998	0.094	0.162	0.025	0.000	0.093	0.159	0.025	0.000	0.095	0.162	0.026	0.000
Year is 1999	0.100	0.171	0.026	0.000	0.097	0.166	0.026	0.000	0.102	0.174	0.027	0.000
Year is 2000	0.153	0.262	0.027	0.000	0.151	0.259	0.027	0.000	0.150	0.257	0.027	0.000
Year is 1993 (ref.)												
R-squared	0.590				0.598				0.588			
N of observations	573				573				573			

Note: Reference group are noted in italics for each categorical independent variable.
Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix B3

Coefficients, Standard Errors, and Significance for Private Four-Year Institution Response to Bright Futures Relative to the Southeast Control Group

	TUITION AND FEES - PRIVATE FOUR-YEAR											
	Model 1				Model 2				Model 3			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Bright Futures variables												
Florida	0.119	0.090	0.064	0.067					0.126	0.095	0.067	0.064
Florida x after	-0.024	-0.015	0.068	0.722								
High BF Concentration					0.360	0.199	0.083	0.000				
Low BF Concentration					-0.013	-0.007	0.071	0.859				
High BF Concentration x after					-0.126	-0.055	0.082	0.126				
Low BF Concentration x after					0.038	0.017	0.081	0.636				
Florida x 1997									-0.031	-0.008	0.100	0.756
Florida x 1998									-0.074	-0.019	0.097	0.447
Florida x 1999									0.031	0.011	0.092	0.734
Florida x 2000									-0.037	-0.013	0.102	0.721
State characteristics												
Postsecondary capacity	-5.217	-0.012	21.956	0.813	9.306	0.022	20.969	0.658	-0.504	-0.001	24.510	0.984
State annual average unemployment rate	-12.142	-0.240	3.258	0.000	-13.622	-0.269	3.080	0.000	-12.222	-0.242	3.317	0.000
Percentage of state residents 25 and older with BA	0.978	0.111	0.728	0.182	0.937	0.107	0.684	0.173	1.134	0.129	0.769	0.143
Log per capita income constant (2006) dollars	0.816	0.201	0.383	0.035	1.250	0.308	0.374	0.001	0.794	0.196	0.388	0.043
Institution characteristics												
Barron's Less Competitive Institutions	0.610	0.505	0.122	0.000	0.598	0.495	0.119	0.000	0.647	0.535	0.131	0.000
Barron's Competitive Institutions	0.825	0.897	0.121	0.000	0.715	0.778	0.121	0.000	0.864	0.940	0.131	0.000
Barron's Very Competitive Institutions	0.806	0.733	0.132	0.000	0.690	0.628	0.130	0.000	0.846	0.769	0.141	0.000
Barron's Highly Competitive Institutions	0.960	0.658	0.133	0.000	0.832	0.570	0.132	0.000	1.000	0.685	0.143	0.000
Barron's Most Competitive Institutions												
Barron's Non-Competitive or Unclassified (ref.)												
Carnegie Research I	1.491	1.022	0.124	0.000	1.293	0.886	0.130	0.000	1.091	0.747	0.141	0.000
Carnegie Research II	0.216	0.039	0.121	0.078	0.094	0.017	0.122	0.446	-0.220	-0.040	0.134	0.103
Carnegie Doctoral I	0.272	0.221	0.059	0.000	0.280	0.228	0.055	0.000	-0.170	-0.139	0.036	0.000
Carnegie Doctoral II	0.294	0.201	0.041	0.000	0.279	0.191	0.039	0.000	-0.147	-0.101	0.048	0.002
Carnegie Masters Comprehensive I	0.441	0.401	0.049	0.000	0.423	0.385	0.046	0.000	-0.441	-0.418	0.049	0.000
Carnegie Masters Comprehensive II	0.097	0.048	0.052	0.063	0.123	0.061	0.049	0.013	-0.345	-0.172	0.065	0.000
Carnegie Baccalaureate Liberal Arts	0.091	0.064	0.058	0.120	0.084	0.059	0.055	0.130	-0.351	-0.247	0.062	0.000
Carnegie Baccalaureate II												
Carnegie Associates Colleges												
Carnegie Professional or Special Emphasis												
Carnegie Unclassified (ref.)												

Note: Reference group are noted in italics for each categorical independent variable.

Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix B3 (Continued)
Coefficients, Standard Errors, and Significance for Private Four-Year Institution Response to Bright Futures Relative to the Southeast Control Group

	TUITION AND FEES - PRIVATE FOUR-YEAR											
	Model 1				Model 2				Model 3			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Log of state appropriations per FTE constant (2006) dollars	-0.044	-0.059	0.020	0.030	-0.056	-0.076	0.019	0.004	-0.042	-0.057	0.020	0.043
Log endowment per FTE constant (2006) dollars	0.070	0.381	0.009	0.000	0.079	0.430	0.009	0.000	0.069	0.377	0.009	0.000
Year fixed effects												
Year is 1994	-0.065	-0.047	0.044	0.142	-0.074	-0.053	0.041	0.075	-0.063	-0.046	0.044	0.154
Year is 1995	-0.060	-0.043	0.048	0.221	-0.077	-0.055	0.046	0.095	-0.060	-0.044	0.049	0.220
Year is 1996	-0.124	-0.089	0.057	0.032	-0.143	-0.103	0.054	0.009	-0.131	-0.094	0.059	0.028
Year is 1997	-0.103	-0.074	0.061	0.095	-0.134	-0.097	0.058	0.023	-0.110	-0.079	0.064	0.088
Year is 1998	-0.151	-0.111	0.079	0.060	-0.213	-0.157	0.076	0.006	-0.154	-0.113	0.083	0.066
Year is 1999	-0.247	-0.190	0.097	0.012	-0.329	-0.254	0.093	0.001	-0.266	-0.205	0.103	0.011
Year is 2000	-0.251	-0.189	0.100	0.013	-0.330	-0.249	0.096	0.001	-0.256	-0.193	0.101	0.013
Year is 1993 (ref.)												
R-squared	0.942				0.949				0.941			
N of observations	150				150				150			

Note: Reference group are noted in italics for each categorical independent variable.
Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix B4

Coefficients, Standard Errors, and Significance for Private Four-Year Institution Response to Bright Futures Relative to the Southeast Control Group

	ROOM AND BOARD - PRIVATE FOUR-YEAR											
	Model 4				Model 5				Model 6			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Bright Futures variables												
Florida	0.115	0.135	0.071	0.111					0.115	0.134	0.073	0.121
Florida x after	0.015	0.014	0.061	0.802					0.037	0.015	0.088	0.674
High BF Concentration					0.287	0.253	0.054	0.000	-0.001	0.000	0.085	0.990
Low BF Concentration					-0.335	-0.282	0.062	0.000	0.012	0.007	0.086	0.890
High BF Concentration x after					0.055	0.038	0.051	0.286	0.018	0.009	0.094	0.851
Low BF Concentration x after					-0.016	-0.010	0.050	0.753				
Florida x 1997												
Florida x 1998												
Florida x 1999												
Florida x 2000												
State characteristics												
Postsecondary capacity	27.539	0.099	20.125	0.174	27.791	0.099	13.195	0.038	26.892	0.096	21.714	0.219
State annual average unemployment rate	5.492	0.163	3.491	0.119	8.969	0.266	2.313	0.000	5.546	0.165	3.573	0.124
Percentage of state residents 25 and older with BA	0.551	0.094	0.679	0.419	-0.131	-0.022	0.449	0.770	0.546	0.093	0.708	0.443
Log per capita income constant (2006) dollars	1.685	0.632	0.344	0.000	2.898	1.088	0.249	0.000	1.680	0.630	0.350	0.000
Institution characteristics												
Barron's Less Competitive Institutions	-0.047	-0.052	0.113	0.679	-0.205	-0.229	0.078	0.010	-0.050	-0.056	0.120	0.676
Barron's Competitive Institutions	0.569	0.880	0.113	0.000	0.215	0.333	0.081	0.009	0.566	0.875	0.122	0.000
Barron's Very Competitive Institutions	0.518	0.736	0.134	0.000	0.276	0.392	0.091	0.003	0.514	0.731	0.144	0.001
Barron's Highly Competitive Institutions	0.591	0.643	0.134	0.000	0.291	0.317	0.092	0.002	0.588	0.639	0.143	0.000
Barron's Most Competitive Institutions												
Barron's Non-Competitive or Unclassified (ref.)												
Carnegie Research I	0.823	0.895	0.140	0.000	0.502	0.547	0.096	0.000	0.702	0.764	0.168	0.000
Carnegie Research II												
Carnegie Doctoral I	0.507	0.147	0.115	0.000	0.368	0.107	0.077	0.000	0.389	0.113	0.131	0.004
Carnegie Doctoral II												
Carnegie Masters Comprehensive I	0.116	0.149	0.037	0.002	0.110	0.141	0.024	0.000				
Carnegie Masters Comprehensive II	0.202	0.220	0.042	0.000	0.169	0.184	0.028	0.000	0.085	0.093	0.052	0.102
Carnegie Baccalaureate Liberal Arts									-0.117	-0.166	0.038	0.003
Carnegie Baccalaureate II	0.535	0.727	0.064	0.000	0.707	0.960	0.045	0.000	0.419	0.568	0.076	0.000
Carnegie Associates Colleges	0.132	0.105	0.061	0.034	0.375	0.299	0.045	0.000	0.015	0.012	0.071	0.832
Carnegie Professional or Special Emphasis												
Carnegie Unclassified (ref.)												

Note: Reference group are noted in italics for each categorical independent variable.

Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix B4 (Continued)
Coefficients, Standard Errors, and Significance for Private Four-Year Institution Response to Bright Futures Relative to the Southeast Control Group

	ROOM AND BOARD - PRIVATE FOUR-YEAR											
	Model 4				Model 5				Model 6			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Log of state appropriations per FTE constant (2006) dollars	0.076	0.141	0.027	0.006	0.117	0.216	0.018	0.000	0.077	0.141	0.028	0.007
Log endowment per FTE constant (2006) dollars	0.111	0.330	0.026	0.000	0.034	0.100	0.018	0.066	0.112	0.331	0.026	0.000
Year fixed effects												
Year is 1994	0.047	0.049	0.043	0.277	0.062	0.065	0.028	0.030	0.047	0.050	0.043	0.283
Year is 1995	0.044	0.047	0.048	0.358	0.057	0.060	0.031	0.075	0.045	0.047	0.049	0.361
Year is 1996	0.014	0.015	0.056	0.798	0.041	0.044	0.037	0.263	0.015	0.016	0.057	0.791
Year is 1997	-0.008	-0.008	0.061	0.899	0.002	0.002	0.040	0.967	-0.009	-0.010	0.063	0.881
Year is 1998	-0.037	-0.041	0.078	0.635	-0.085	-0.093	0.052	0.100	-0.033	-0.036	0.082	0.684
Year is 1999	-0.109	-0.124	0.094	0.253	-0.132	-0.151	0.062	0.036	-0.106	-0.121	0.099	0.287
Year is 2000	-0.163	-0.177	0.096	0.093	-0.239	-0.260	0.063	0.000	-0.161	-0.175	0.098	0.103
Year is 1993 (ref.)												
R-squared	0.909				0.961				0.906			
N of observations	125				125				125			

Note: Reference group are noted in italics for each categorical independent variable.
Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix B5
Coefficients, Standard Errors, and Significance for Private Four-Year Institution Response to Bright Futures Relative to the Southeast Control Group

	INSTITUTIONAL GRANTS - PRIVATE FOUR-YEAR											
	Model 7				Model 8				Model 9			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Bright Futures variables												
Florida	-0.993	-0.573	0.577	0.092					-1.220	-0.704	0.660	0.071
Florida x after	-0.003	-0.001	0.202	0.990								
High BF Concentration					-0.821	-0.368	1.444	0.572				
Low BF Concentration					-0.830	-0.351	0.600	0.174				
High BF Concentration x after					0.238	0.078	0.235	0.316				
Low BF Concentration x after					-0.227	-0.065	0.257	0.383				
Florida x 1997									0.059	0.014	0.306	0.848
Florida x 1998									-0.020	-0.003	0.320	0.952
Florida x 1999									-0.101	-0.024	0.258	0.699
Florida x 2000									-0.208	-0.049	0.574	0.719
State characteristics												
Postsecondary capacity	10.049	0.007	107.566	0.926	44.602	0.031	130.990	0.735	62.443	0.043	248.300	0.803
State annual average unemployment rate	12.566	0.178	13.695	0.364	18.770	0.266	19.354	0.337	16.222	0.230	15.225	0.292
Percentage of state residents 25 and older with BA	-0.076	-0.005	2.431	0.975	-0.117	-0.008	2.382	0.961	-0.592	-0.038	2.657	0.825
Log per capita income constant (2006) dollars	3.369	0.402	4.321	0.439	6.383	0.761	9.478	0.504	1.989	0.237	4.799	0.681
Institution characteristics												
Barron's Less Competitive Institutions	-5.240	-2.347	0.943	0.000	-5.614	-2.515	1.028	0.000	-5.011	-2.245	1.026	0.000
Barron's Competitive Institutions	-2.044	-1.423	0.405	0.000	-2.214	-1.541	0.429	0.000	-1.955	-1.361	0.434	0.000
Barron's Very Competitive Institutions												
Barron's Highly Competitive Institutions												
Barron's Most Competitive Institutions												
Barron's Non-Competitive or Unclassified (ref.)												
Carnegie Research I	0.566	0.327	0.186	0.004					0.532	0.307	0.196	0.009
Carnegie Research II												
Carnegie Doctoral I												
Carnegie Doctoral II												
Carnegie Masters Comprehensive I	-0.418	-0.187	0.150	0.008	-1.054	-0.472	0.215	0.000	-0.406	-0.182	0.154	0.012
Carnegie Masters Comprehensive II					-0.612	-0.361	0.189	0.002				
Carnegie Baccalaureate Liberal Arts	0.763	0.441	0.144	0.000	0.199	0.115	0.108	0.071				
Carnegie Baccalaureate II	1.702	0.982	0.609	0.008	1.514	0.874	1.018	0.144	0.736	0.425	0.153	0.000
Carnegie Associates Colleges									1.557	0.899	0.661	0.023
Carnegie Professional or Special Emphasis												
Carnegie Unclassified (ref.)												

Note: Reference group are noted in italics for each categorical independent variable.
Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix B5 (Continued)
Coefficients, Standard Errors, and Significance for Private Four-Year Institution Response to Bright Futures Relative to the Southeast Control Group

	INSTITUTIONAL GRANTS - PRIVATE FOUR-YEAR											
	Model 7				Model 8				Model 9			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Log of state appropriations per FTE constant (2006) dollars	0.609	0.280	0.154	0.000	0.641	0.295	0.150	0.000	0.627	0.289	0.160	0.000
Log endowment per FTE constant (2006) dollars	-1.059	-1.482	0.246	0.000	-1.168	-1.634	0.263	0.000	-1.004	-1.404	0.265	0.000
Year fixed effects												
Year is 1994	0.061	0.029	0.150	0.688	0.089	0.042	0.156	0.572	0.118	0.056	0.193	0.544
Year is 1995	0.077	0.033	0.198	0.698	0.092	0.039	0.195	0.640	0.151	0.064	0.227	0.510
Year is 1996	0.025	0.012	0.276	0.928	0.023	0.011	0.269	0.933	0.138	0.065	0.322	0.670
Year is 1997	0.103	0.046	0.363	0.777	0.050	0.022	0.402	0.902	0.237	0.106	0.423	0.579
Year is 1998	0.011	0.005	0.520	0.984	-0.160	-0.076	0.686	0.816	0.235	0.111	0.600	0.697
Year is 1999	-0.105	-0.049	0.675	0.877	-0.303	-0.143	0.891	0.735	0.192	0.090	0.787	0.808
Year is 2000	-0.211	-0.099	0.796	0.792	-0.505	-0.238	1.166	0.667	0.171	0.081	0.952	0.858
Year is 1993 (ref.)												
R-squared	0.944				0.949				0.945			
N of observations	69				69				125			

Note: Reference group are noted in italics for each categorical independent variable.
Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix B6

Coefficients, Standard Errors, and Significance for Public Two-Year Institution Response to Bright Futures Relative to the Southeast Control Group

	TUITION AND FEES - PUBLIC TWO-YEAR											
	Model 1				Model 2				Model 3			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Bright Futures variables												
Florida	-0.644	-0.542	0.034	0.000					-0.649	-0.546	0.034	0.000
Florida x after	0.588	0.374	0.043	0.000								
High BF Concentration					-0.584	-0.373	0.042	0.000				
Low BF Concentration					-0.705	-0.451	0.044	0.000				
High BF Concentration x after					0.469	0.218	0.055	0.000				
Low BF Concentration x after					0.708	0.328	0.055	0.000				
Florida x 1997									0.435	0.147	0.062	0.000
Florida x 1998									0.525	0.178	0.062	0.000
Florida x 1999									0.758	0.253	0.067	0.000
Florida x 2000									0.711	0.229	0.066	0.000
State characteristics												
Postsecondary capacity	5.119	0.013	9.115	0.574	4.974	0.013	9.088	0.584	8.383	0.022	9.165	0.361
State annual average unemployment rate	46.349	1.022	1.502	0.000	46.366	1.023	1.497	0.000	47.366	1.045	1.509	0.000
Percentage of state residents 25 and older with BA	5.224	0.462	0.577	0.000	5.223	0.461	0.575	0.000	5.710	0.504	0.587	0.000
Log per capita income constant (2006) dollars	1.706	0.353	0.244	0.000	1.707	0.353	0.243	0.000	1.564	0.324	0.245	0.000
Institutional characteristics												
Log of State and Local Appropby FTE	-0.234	-0.303	0.014	0.000	-0.230	-0.298	0.015	0.000	-0.228	-0.296	0.014	0.000
Year fixed effects												
Year is 1994	0.299	0.197	0.035	0.000	0.299	0.197	0.035	0.000	0.306	0.202	0.035	0.000
Year is 1995	0.393	0.258	0.037	0.000	0.392	0.258	0.037	0.000	0.399	0.263	0.036	0.000
Year is 1996	0.439	0.290	0.038	0.000	0.439	0.290	0.038	0.000	0.446	0.295	0.037	0.000
Year is 1997	0.413	0.271	0.040	0.000	0.412	0.270	0.040	0.000	0.457	0.300	0.042	0.000
Year is 1998	0.606	0.400	0.044	0.000	0.606	0.400	0.044	0.000	0.634	0.419	0.046	0.000
Year is 1999	0.697	0.458	0.046	0.000	0.697	0.458	0.046	0.000	0.673	0.442	0.047	0.000
Year is 2000	0.543	0.355	0.049	0.000	0.546	0.357	0.049	0.000	0.537	0.351	0.049	0.000
Year is 1993 (ref.)												
R-squared	0.609				0.612				0.615			
N of observations	1442				1442				1442			

Note: Reference group are noted in italics for each categorical independent variable.

Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix C1
Coefficients, Standard Errors, and Significance for Public Four-Year Institution Response to Bright Futures Relative to the U.S. Control Group

	TUITION AND FEES - PUBLIC FOUR-YEAR											
	Model 1				Model 2				Model 3			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Bright Futures variables									-0.465	-0.178	0.048	0.000
Florida	-0.465	-0.178	0.048	0.000								
Florida x after	-0.007	-0.002	0.067	0.916								
High BF Concentration					-0.495	-0.128	0.072	0.000				
Low BF Concentration					-0.441	-0.127	0.064	0.000				
High BF Concentration x after					-0.012	-0.002	0.100	0.901				
Low BF Concentration x after					-0.003	-0.001	0.089	0.975				
Florida x 1997									-0.046	-0.006	0.105	0.665
Florida x 1998									-0.021	-0.003	0.105	0.841
Florida x 1999									0.006	0.001	0.106	0.955
Florida x 2000									0.033	0.005	0.106	0.755
State characteristics												
Postsecondary capacity	11.706	0.055	2.884	0.000	11.716	0.055	2.885	0.000	11.691	0.055	2.886	0.000
State annual average unemployment rate	0.695	0.024	0.499	0.164	0.697	0.025	0.499	0.163	0.701	0.025	0.499	0.160
Percentage of state residents 25 and older with BA	-2.039	-0.254	0.176	0.000	-2.038	-0.254	0.176	0.000	-2.036	-0.254	0.176	0.000
Log per capita income constant (2006) dollars	1.829	0.694	0.061	0.000	1.828	0.694	0.061	0.000	1.828	0.694	0.061	0.000
Institution characteristics												
Barron's Less Competitive Institutions	0.024	0.022	0.020	0.213	0.024	0.023	0.020	0.211	0.024	0.022	0.020	0.213
Barron's Competitive Institutions	0.076	0.102	0.016	0.000	0.076	0.101	0.016	0.000	0.076	0.102	0.016	0.000
Barron's Very Competitive Institutions	0.074	0.073	0.021	0.000	0.075	0.073	0.021	0.000	0.074	0.072	0.021	0.000
Barron's Highly Competitive Institutions	0.155	0.092	0.030	0.000	0.158	0.094	0.030	0.000	0.155	0.092	0.030	0.000
Barron's Most Competitive Institutions	0.234	0.052	0.061	0.000	0.233	0.052	0.061	0.000	0.233	0.052	0.061	0.000
Barron's Non-Competitive or Unclassified (ref.)												
Carnegie Research I	0.288	0.229	0.021	0.000	0.192	0.153	0.024	0.000	0.288	0.229	0.021	0.000
Carnegie Research II	0.290	0.164	0.025	0.000	0.191	0.108	0.028	0.000	0.290	0.164	0.025	0.000
Carnegie Doctoral I	0.123	0.070	0.024	0.000	0.026	0.015	0.026	0.320	0.123	0.070	0.024	0.000
Carnegie Doctoral II	0.245	0.160	0.021	0.000	0.148	0.096	0.024	0.000	0.245	0.160	0.021	0.000
Carnegie Masters Comprehensive I	--	--	--	--	-0.097	-0.127	0.015	0.000	--	--	--	--
Carnegie Masters Comprehensive II	0.234	0.122	0.026	0.000	0.137	0.071	0.027	0.000	0.234	0.122	0.026	0.000
Carnegie Baccalaureate Liberal Arts	0.400	0.162	0.033	0.000	0.303	0.123	0.035	0.000	0.400	0.162	0.033	0.000
Carnegie Baccalaureate II	0.097	0.097	0.015	0.000	--	--	--	--	0.097	0.097	0.015	0.000
Carnegie Associates Colleges	0.148	0.080	0.026	0.000	0.052	0.028	0.027	0.053	0.148	0.080	0.026	0.000
Carnegie Professional or Special Emphasis	0.404	0.256	0.027	0.000	0.308	0.195	0.029	0.000	0.404	0.256	0.027	0.000
Carnegie Unclassified (ref.)												

Note: Reference group are noted in italics for each categorical independent variable.
Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix C1 (Continued)
Coefficients, Standard Errors, and Significance for Public Four-Year Institution Response to Bright Futures Relative to the U.S. Control Group

	TUITION AND FEES - PUBLIC FOUR-YEAR											
	Model 1				Model 2				Model 3			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Log of state appropriations per FTE constant (2006) dollars	-0.148	-0.266	0.010	0.000	-0.149	-0.267	0.010	0.000	-0.148	-0.266	0.010	0.000
Log endowment per FTE constant (2006) dollars	-0.004	-0.030	0.002	0.052	-0.003	-0.029	0.002	0.053	-0.004	-0.030	0.002	0.052
Year fixed effects												
Year is 1994	0.018	0.016	0.020	0.350	0.018	0.016	0.020	0.350	0.018	0.016	0.020	0.350
Year is 1995	0.067	0.059	0.020	0.001	0.067	0.059	0.020	0.001	0.067	0.059	0.020	0.001
Year is 1996	0.070	0.062	0.020	0.001	0.071	0.062	0.020	0.001	0.071	0.062	0.020	0.001
Year is 1997	0.067	0.059	0.021	0.002	0.067	0.060	0.021	0.002	0.068	0.060	0.021	0.001
Year is 1998	0.033	0.029	0.023	0.142	0.033	0.030	0.023	0.141	0.034	0.030	0.023	0.139
Year is 1999	0.061	0.054	0.023	0.009	0.061	0.054	0.023	0.009	0.061	0.054	0.023	0.009
Year is 2000	0.018	0.016	0.024	0.465	0.018	0.016	0.024	0.460	0.017	0.015	0.024	0.484
Year is 1993 (ref.)												
R-squared	0.445				0.445				0.445			
N of observations	3418				3418				3418			

Note: Reference group are noted in italics for each categorical independent variable.
Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix C2

Coefficients, Standard Errors, and Significance for Public Four-Year Institution Response to Bright Futures Relative to the U.S. Control Group

	ROOM AND BOARD - PUBLIC FOUR-YEAR											
	Model 4				Model 5				Model 6			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Bright Futures variables												
Florida	-0.043	-0.026	0.029	0.138					-0.043	-0.026	0.029	0.138
Florida x after	0.056	0.024	0.040	0.165								
High BF Concentration					0.006	0.003	0.038	0.885				
Low BF Concentration					-0.105	-0.042	0.044	0.016				
High BF Concentration x after					0.072	0.024	0.053	0.173				
Low BF Concentration x after					0.034	0.010	0.061	0.574				
Florida x 1997									0.020	0.004	0.064	0.748
Florida x 1998									0.066	0.014	0.064	0.301
Florida x 1999									0.021	0.005	0.064	0.739
Florida x 2000									0.116	0.025	0.064	0.068
State characteristics												
Postsecondary capacity	0.456	0.003	1.698	0.788	0.427	0.003	1.695	0.801	0.408	0.003	1.699	0.810
State annual average unemployment rate	8.090	0.449	0.304	0.000	8.085	0.449	0.304	0.000	8.091	0.449	0.304	0.000
Percentage of state residents 25 and older with BA	0.539	0.106	0.113	0.000	0.538	0.106	0.113	0.000	0.538	0.106	0.113	0.000
Log per capita income constant (2006) dollars	0.936	0.570	0.039	0.000	0.938	0.572	0.039	0.000	0.936	0.570	0.039	0.000
Institution characteristics												
Barron's Less Competitive Institutions	0.003	0.005	0.014	0.815	0.003	0.004	0.014	0.840	0.003	0.005	0.014	0.816
Barron's Competitive Institutions	0.020	0.042	0.012	0.091	0.021	0.043	0.012	0.084	0.020	0.042	0.012	0.091
Barron's Very Competitive Institutions	0.035	0.057	0.014	0.013	0.033	0.054	0.014	0.020	0.035	0.057	0.014	0.013
Barron's Highly Competitive Institutions	0.017	0.017	0.018	0.358	0.011	0.011	0.018	0.562	0.017	0.017	0.018	0.359
Barron's Most Competitive Institutions	0.069	0.028	0.034	0.041	0.069	0.028	0.034	0.041	0.069	0.028	0.034	0.041
Barron's Non-Competitive or Unclassified (ref.)												
Carnegie Research I	0.209	0.287	0.012	0.000	0.208	0.286	0.012	0.000	0.209	0.287	0.012	0.000
Carnegie Research II	0.172	0.173	0.014	0.000	0.177	0.178	0.014	0.000	0.172	0.173	0.014	0.000
Carnegie Doctoral I	0.095	0.092	0.013	0.000	0.095	0.092	0.013	0.000	0.095	0.092	0.013	0.000
Carnegie Doctoral II	0.164	0.175	0.012	0.000	0.165	0.177	0.012	0.000	0.164	0.175	0.012	0.000
Carnegie Masters Comprehensive I	--	--	--	--	--	--	--	--	--	--	--	--
Carnegie Masters Comprehensive II	0.144	0.122	0.015	0.000	0.144	0.122	0.015	0.000	0.144	0.122	0.015	0.000
Carnegie Baccalaureate Liberal Arts	0.101	0.069	0.019	0.000	0.102	0.070	0.019	0.000	0.101	0.069	0.019	0.000
Carnegie Baccalaureate II	0.068	0.101	0.009	0.000	0.068	0.101	0.009	0.000	0.068	0.101	0.009	0.000
Carnegie Associates Colleges	0.075	0.035	0.027	0.006	0.074	0.034	0.027	0.006	0.075	0.035	0.027	0.006
Carnegie Professional or Special Emphasis	0.147	0.100	0.019	0.000	0.146	0.100	0.019	0.000	0.147	0.101	0.019	0.000
Carnegie Unclassified (ref.)												

Note: Reference group are noted in italics for each categorical independent variable.

Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix C2 (Continued)
Coefficients, Standard Errors, and Significance for Public Four-Year Institution Response to Bright Futures Relative to the U.S. Control Group

	ROOM AND BOARD - PUBLIC FOUR-YEAR											
	Model 4				Model 5				Model 6			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Log of state appropriations per FTE constant (2006) dollars	-0.031	-0.059	0.008	0.000	-0.030	-0.056	0.008	0.000	-0.031	-0.059	0.008	0.000
Log endowment per FTE constant (2006) dollars	0.004	0.045	0.001	0.001	0.004	0.046	0.001	0.001	0.004	0.045	0.001	0.001
Year fixed effects												
Year is 1994	0.057	0.079	0.012	0.000	0.057	0.079	0.012	0.000	0.057	0.079	0.012	0.000
Year is 1995	0.090	0.125	0.012	0.000	0.090	0.124	0.012	0.000	0.090	0.125	0.012	0.000
Year is 1996	0.085	0.118	0.012	0.000	0.085	0.118	0.012	0.000	0.085	0.118	0.012	0.000
Year is 1997	0.111	0.153	0.013	0.000	0.110	0.153	0.013	0.000	0.111	0.154	0.013	0.000
Year is 1998	0.126	0.174	0.014	0.000	0.125	0.173	0.014	0.000	0.125	0.173	0.014	0.000
Year is 1999	0.139	0.192	0.014	0.000	0.138	0.192	0.014	0.000	0.140	0.193	0.014	0.000
Year is 2000	0.152	0.210	0.015	0.000	0.152	0.209	0.015	0.000	0.151	0.208	0.015	0.000
Year is 1993 (ref.)												
R-squared	0.618				0.619				0.618			
N of observations	2595				2595				2595			

Note: Reference group are noted in italics for each categorical independent variable.
Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix C3
Coefficients, Standard Errors, and Significance for Private Four-Year Institution Response to Bright Futures Relative to the U.S. Control Group

	TUITION AND FEES - PRIVATE FOUR-YEAR											
	Model 1				Model 2				Model 3			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Bright Futures variables												
Florida	-0.099	-0.034	0.079	0.206								
Florida x after	-0.033	-0.009	0.099	0.740					-0.098	-0.034	0.079	0.210
High BF Concentration					0.053	0.013	0.110	0.634				
Low BF Concentration					-0.246	-0.060	0.109	0.025				
High BF Concentration x after					-0.016	-0.003	0.138	0.909				
Low BF Concentration x after					-0.051	-0.010	0.138	0.710				
Florida x 1997									0.057	0.006	0.170	0.735
Florida x 1998									0.026	0.003	0.170	0.879
Florida x 1999									-0.140	-0.022	0.133	0.293
Florida x 2000									-0.003	0.000	0.133	0.984
State characteristics												
Postsecondary capacity	-4.801	-0.031	3.654	0.189	-4.505	-0.029	3.643	0.216	-4.927	-0.032	3.658	0.178
State annual average unemployment rate	-3.340	-0.112	1.131	0.003	-3.341	-0.112	1.127	0.003	-3.365	-0.112	1.132	0.003
Percentage of state residents 25 and older with BA	-1.227	-0.108	0.346	0.000	-1.207	-0.107	0.345	0.000	-1.234	-0.109	0.346	0.000
Log per capita income constant (2006) dollars	1.540	0.437	0.126	0.000	1.536	0.436	0.126	0.000	1.543	0.438	0.126	0.000
Institution characteristics												
Barron's Less Competitive Institutions	-0.242	-0.189	0.033	0.000	-0.231	-0.181	0.033	0.000	-0.244	-0.191	0.033	0.000
Barron's Competitive Institutions	-0.024	-0.032	0.026	0.350	-0.025	-0.033	0.026	0.335	-0.025	-0.034	0.026	0.328
Barron's Very Competitive Institutions	0.040	0.048	0.029	0.161	0.041	0.048	0.029	0.158	0.039	0.046	0.029	0.175
Barron's Highly Competitive Institutions	0.216	0.174	0.035	0.000	0.216	0.174	0.035	0.000	0.215	0.173	0.035	0.000
Barron's Most Competitive Institutions	0.229	0.166	0.045	0.000	0.222	0.161	0.045	0.000	0.227	0.165	0.045	0.000
Barron's Non-Competitive or Unclassified (ref.)												
Carnegie Research I	0.403	0.281	0.042	0.000	0.391	0.272	0.042	0.000	0.402	0.280	0.042	0.000
Carnegie Research II	0.237	0.073	0.061	0.000	0.234	0.072	0.061	0.000	0.236	0.073	0.061	0.000
Carnegie Doctoral I	0.247	0.149	0.032	0.000	0.242	0.145	0.032	0.000	0.246	0.148	0.032	0.000
Carnegie Doctoral II	0.131	0.064	0.038	0.001	0.129	0.063	0.038	0.001	0.130	0.063	0.038	0.001
Carnegie Masters Comprehensive I	0.177	0.204	0.019	0.000	0.174	0.200	0.019	0.000	0.177	0.203	0.019	0.000
Carnegie Masters Comprehensive II	0.130	0.074	0.032	0.000	0.128	0.073	0.032	0.000	0.129	0.074	0.032	0.000
Carnegie Baccalaureate Liberal Arts	0.342	0.350	0.024	0.000	0.340	0.348	0.024	0.000	0.342	0.349	0.024	0.000
Carnegie Baccalaureate II												
Carnegie Associates Colleges	0.245	0.092	0.050	0.000	0.243	0.091	0.049	0.000	0.244	0.091	0.050	0.000
Carnegie Professional or Special Emphasis	-0.008	-0.008	0.024	0.731	-0.010	-0.010	0.024	0.679	-0.009	-0.009	0.024	0.701
Carnegie Unclassified (ref.)												

Note: Reference group are noted in italics for each categorical independent variable.
Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix C3 (Continued)
Coefficients, Standard Errors, and Significance for Private Four-Year Institution Response to Bright Futures Relative to the U.S. Control Group

	TUITION AND FEES - PRIVATE FOUR-YEAR											
	Model 1				Model 2				Model 3			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Log of state appropriations per FTE constant (2006) dollars	-0.009	-0.028	0.007	0.195	-0.009	-0.028	0.007	0.182	-0.009	-0.029	0.007	0.177
Log endowment per FTE constant (2006) dollars	0.029	0.200	0.003	0.000	0.029	0.202	0.003	0.000	0.029	0.201	0.003	0.000
Year fixed effects												
Year is 1994	-0.011	-0.010	0.026	0.680	-0.011	-0.010	0.026	0.679	-0.011	-0.010	0.026	0.675
Year is 1995	-0.010	-0.009	0.028	0.723	-0.010	-0.009	0.028	0.723	-0.010	-0.009	0.028	0.715
Year is 1996	-0.027	-0.024	0.030	0.370	-0.027	-0.024	0.030	0.367	-0.027	-0.025	0.030	0.363
Year is 1997	-0.041	-0.037	0.031	0.194	-0.041	-0.037	0.031	0.193	-0.042	-0.038	0.031	0.178
Year is 1998	-0.074	-0.067	0.038	0.055	-0.074	-0.067	0.038	0.054	-0.075	-0.068	0.038	0.051
Year is 1999	-0.085	-0.078	0.042	0.043	-0.085	-0.078	0.042	0.043	-0.083	-0.076	0.042	0.049
Year is 2000	-0.116	-0.105	0.048	0.016	-0.116	-0.105	0.048	0.015	-0.117	-0.106	0.048	0.015
Year is 1993 (ref.)												
R-squared	0.666				0.668				0.666			
N of observations	1264				1264				1264			

Note: Reference group are noted in italics for each categorical independent variable.
Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix C4

Coefficients, Standard Errors, and Significance for Private Four-Year Institution Response to Bright Futures Relative to the U.S. Control Group

	ROOM AND BOARD - PRIVATE FOUR-YEAR											
	Model 4				Model 5				Model 6			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Bright Futures variables												
Florida	0.043	0.026	0.064	0.502					0.044	0.026	0.064	0.497
Florida x after	-0.050	-0.023	0.080	0.532								
High BF Concentration					0.230	0.101	0.088	0.009				
Low BF Concentration					-0.142	-0.059	0.088	0.105				
High BF Concentration x after					0.003	0.001	0.109	0.981				
Low BF Concentration x after					-0.155	-0.048	0.113	0.173				
Florida x 1997									-0.017	-0.003	0.136	0.899
Florida x 1998									-0.032	-0.006	0.136	0.816
Florida x 1999									-0.120	-0.033	0.107	0.262
Florida x 2000									0.006	0.001	0.118	0.959
State characteristics												
Postsecondary capacity	10.825	0.086	4.862	0.026	12.878	0.103	4.800	0.007	10.462	0.083	4.880	0.032
State annual average unemployment rate	0.498	0.027	1.141	0.663	0.255	0.014	1.124	0.820	0.472	0.025	1.142	0.680
Percentage of state residents 25 and older with BA	1.311	0.178	0.361	0.000	1.326	0.180	0.355	0.000	1.305	0.178	0.361	0.000
Log per capita income constant (2006) dollars	0.787	0.353	0.129	0.000	0.794	0.356	0.127	0.000	0.790	0.355	0.129	0.000
Institution characteristics												
Barron's Less Competitive Institutions	-0.230	-0.266	0.036	0.000	-0.212	-0.245	0.036	0.000	-0.233	-0.269	0.036	0.000
Barron's Competitive Institutions	-0.092	-0.195	0.030	0.002	-0.100	-0.214	0.029	0.001	-0.093	-0.199	0.030	0.002
Barron's Very Competitive Institutions	-0.014	-0.028	0.033	0.667	-0.021	-0.042	0.032	0.514	-0.015	-0.031	0.033	0.637
Barron's Highly Competitive Institutions	0.087	0.125	0.036	0.015	0.081	0.116	0.035	0.021	0.086	0.123	0.036	0.017
Barron's Most Competitive Institutions	0.054	0.070	0.042	0.196	0.037	0.048	0.041	0.370	0.052	0.068	0.042	0.211
Barron's Non-Competitive or Unclassified (ref.)												
Carnegie Research I	0.121	0.151	0.034	0.000	0.109	0.136	0.034	0.001	0.121	0.150	0.034	0.000
Carnegie Research II	0.079	0.044	0.048	0.103	0.079	0.044	0.048	0.099	0.079	0.044	0.048	0.105
Carnegie Doctoral I	0.052	0.053	0.026	0.050	0.049	0.050	0.026	0.061	0.051	0.051	0.027	0.057
Carnegie Doctoral II	-0.014	-0.011	0.033	0.665	-0.011	-0.009	0.033	0.735	-0.015	-0.012	0.033	0.650
Carnegie Masters Comprehensive I												
Carnegie Masters Comprehensive II	0.049	0.051	0.027	0.065	0.053	0.055	0.026	0.043	0.049	0.051	0.027	0.065
Carnegie Baccalaureate Liberal Arts	-0.035	-0.063	0.019	0.071	-0.034	-0.060	0.019	0.077	-0.035	-0.064	0.019	0.067
Carnegie Baccalaureate II	-0.044	-0.079	0.017	0.010	-0.036	-0.065	0.017	0.032	-0.043	-0.078	0.017	0.011
Carnegie Associates Colleges	-0.194	-0.129	0.045	0.000	-0.199	-0.132	0.044	0.000	-0.195	-0.129	0.045	0.000
Carnegie Professional or Special Emphasis	-0.068	-0.071	0.032	0.033	-0.070	-0.074	0.031	0.024	-0.068	-0.072	0.032	0.032
Carnegie Unclassified (ref.)												

Note: Reference group are noted in italics for each categorical independent variable.

Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix C4 (Continued)
Coefficients, Standard Errors, and Significance for Private Four-Year Institution Response to Bright Futures Relative to the U.S. Control Group

	ROOM AND BOARD - PRIVATE FOUR-YEAR											
	Model 4				Model 5				Model 6			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Log of state appropriations per FTE constant (2006) dollars	-0.001	-0.004	0.007	0.914	0.001	0.002	0.007	0.945	-0.002	-0.007	0.007	0.834
Log endowment per FTE constant (2006) dollars	-0.009	-0.073	0.004	0.022	-0.008	-0.068	0.004	0.031	-0.008	-0.072	0.004	0.024
Year fixed effects												
Year is 1994	0.006	0.009	0.024	0.790	0.004	0.006	0.023	0.858	0.006	0.009	0.024	0.797
Year is 1995	0.003	0.004	0.026	0.922	0.000	0.000	0.026	0.991	0.002	0.003	0.026	0.935
Year is 1996	-0.004	-0.006	0.028	0.888	-0.007	-0.010	0.027	0.792	-0.004	-0.006	0.028	0.872
Year is 1997	-0.018	-0.027	0.029	0.537	-0.021	-0.032	0.029	0.458	-0.019	-0.028	0.029	0.514
Year is 1998	-0.045	-0.067	0.037	0.223	-0.051	-0.075	0.037	0.162	-0.046	-0.068	0.037	0.214
Year is 1999	-0.051	-0.075	0.041	0.217	-0.058	-0.085	0.041	0.156	-0.050	-0.073	0.041	0.230
Year is 2000	-0.081	-0.119	0.047	0.088	-0.092	-0.134	0.047	0.050	-0.083	-0.122	0.047	0.080
Year is 1993 (ref.)												
R-squared	0.444				0.463				0.445			
N of observations	1014				1014				1014			

Note: Reference group are noted in italics for each categorical independent variable.
Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix C5
Coefficients, Standard Errors, and Significance for Private Four-Year Institution Response to Bright Futures Relative to the U.S. Control Group

	INSTITUTIONAL GRANTS - PRIVATE FOUR-YEAR											
	Model 7				Model 8				Model 9			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Bright Futures variables												
Florida	-0.323	-0.057	0.190	0.089					-0.250	-0.036	0.228	0.272
Florida x after	-0.121	-0.016	0.249	0.627								
High BF Concentration					0.207	0.021	0.320	0.518				
Low BF Concentration					-0.692	-0.068	0.315	0.028				
High BF Concentration x after					-0.281	-0.023	0.399	0.480				
Low BF Concentration x after					-0.676	-0.049	0.414	0.103				
Florida x 1997									-0.059	-0.003	0.490	0.904
Florida x 1998									0.323	0.011	0.657	0.623
Florida x 1999									-0.560	-0.037	0.383	0.145
Florida x 2000									-0.658	-0.043	0.384	0.087
State characteristics												
Postsecondary capacity	3.376	0.009	13.801	0.807	-64.575	-0.135	13.903	0.000	-66.756	-0.140	13.979	0.000
State annual average unemployment rate	-1.946	-0.033	2.955	0.510	4.585	0.064	3.275	0.162	4.672	0.066	3.294	0.156
Percentage of state residents 25 and older with BA	-1.424	-0.062	0.947	0.133	-1.267	-0.047	1.041	0.224	-1.378	-0.051	1.046	0.188
Log per capita income constant (2006) dollars	0.336	0.049	0.324	0.299	0.646	0.080	0.354	0.068	0.660	0.082	0.356	0.064
Institution characteristics												
Barron's Less Competitive Institutions	-0.775	-0.298	0.098	0.000	-0.631	-0.204	0.093	0.000	-0.666	-0.215	0.094	0.000
Barron's Competitive Institutions	-0.210	-0.144	0.078	0.007	-0.156	-0.087	0.071	0.027	-0.153	-0.085	0.071	0.032
Barron's Very Competitive Institutions	-0.103	-0.063	0.087	0.235	-0.023	-0.011	0.081	0.778	-0.024	-0.012	0.082	0.773
Barron's Highly Competitive Institutions	-0.167	-0.074	0.098	0.088	-0.112	-0.038	0.100	0.264	-0.113	-0.038	0.101	0.261
Barron's Most Competitive Institutions	-0.043	-0.016	0.117	0.714	0.010	0.003	0.121	0.935	0.028	0.009	0.121	0.818
Barron's Non-Competitive or Unclassified (ref.)												
Carnegie Research I	0.382	0.141	0.101	0.000	0.343	0.099	0.114	0.003	0.380	0.110	0.114	0.001
Carnegie Research II	0.577	0.099	0.147	0.000	0.511	0.067	0.176	0.004	0.523	0.068	0.177	0.003
Carnegie Doctoral I	0.063	0.021	0.080	0.429	0.062	0.016	0.093	0.509	0.084	0.021	0.094	0.370
Carnegie Doctoral II	0.302	0.065	0.119	0.011	0.037	0.008	0.107	0.730	0.041	0.009	0.107	0.706
Carnegie Masters Comprehensive I	0.203	0.121	0.050	0.000	0.204	0.098	0.055	0.000	0.218	0.105	0.055	0.000
Carnegie Masters Comprehensive II	0.024	0.008	0.078	0.753	0.076	0.018	0.092	0.409	0.081	0.020	0.092	0.379
Carnegie Baccalaureate Liberal Arts	0.645	0.359	0.062	0.000	0.575	0.247	0.069	0.000	0.584	0.251	0.070	0.000
Carnegie Baccalaureate II												
Carnegie Associates Colleges	-0.435	-0.072	0.143	0.002	-0.286	-0.042	0.150	0.057	-0.276	-0.040	0.151	0.068
Carnegie Professional or Special Emphasis	-0.421	-0.184	0.070	0.000	-0.419	-0.170	0.068	0.000	-0.413	-0.168	0.069	0.000
Carnegie Unclassified (ref.)												

Note: Reference group are noted in italics for each categorical independent variable.
Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix C5 (Continued)
Coefficients, Standard Errors, and Significance for Private Four-Year Institution Response to Bright Futures Relative to the Southeast Control Group

	INSTITUTIONAL GRANTS - PRIVATE FOUR-YEAR											
	Model 7				Model 8				Model 9			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Log of state appropriations per FTE constant (2006) dollars	0.015	0.024	0.020	0.450	-0.091	-0.122	0.020	0.000	-0.091	-0.122	0.020	0.000
Log endowment per FTE constant (2006) dollars	0.083	0.226	0.010	0.000	0.142	0.373	0.009	0.000	0.142	0.372	0.009	0.000
Year fixed effects												
Year is 1994	0.070	0.032	0.067	0.298	0.129	0.049	0.075	0.085	0.130	0.050	0.075	0.085
Year is 1995	0.108	0.048	0.074	0.147	0.160	0.059	0.082	0.053	0.162	0.060	0.083	0.051
Year is 1996	0.245	0.112	0.077	0.002	0.318	0.116	0.087	0.000	0.319	0.116	0.087	0.000
Year is 1997	0.329	0.152	0.081	0.000	0.436	0.161	0.091	0.000	0.431	0.159	0.092	0.000
Year is 1998	0.409	0.190	0.100	0.000	0.521	0.196	0.110	0.000	0.522	0.197	0.110	0.000
Year is 1999	0.392	0.182	0.111	0.000	0.549	0.214	0.120	0.000	0.555	0.216	0.121	0.000
Year is 2000	0.465	0.217	0.127	0.000	0.683	0.268	0.136	0.000	0.692	0.271	0.137	0.000
Year is 1993 (ref.)												
R-squared	0.514				0.518				0.513			
N of observations	1047				1229				1229			

Note: Reference group are noted in italics for each categorical independent variable.
Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

Appendix C6

Coefficients, Standard Errors, and Significance for Public Two-Year Institution Response to Bright Futures Relative to the U.S. Control Group

	TUITION AND FEES - PUBLIC TWO-YEAR											
	Model 1				Model 2				Model 3			
	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.	Unstandard-ized Beta	Standard-ized Beta	S.E.	Sig.
Bright Futures variables												
Florida	-0.383	-0.130	0.049	0.000					-0.383	-0.130	0.049	0.000
Florida x after	0.122	0.030	0.069	0.077								
High BF Concentration					-0.203	-0.049	0.068	0.003				
Low BF Concentration					-0.559	-0.136	0.068	0.000				
High BF Concentration x after					-0.034	-0.006	0.096	0.726				
Low BF Concentration x after					0.274	0.047	0.096	0.004				
Florida x 1997									0.059	0.007	0.108	0.583
Florida x 1998									0.149	0.019	0.108	0.166
Florida x 1999									0.102	0.013	0.109	0.348
Florida x 2000									0.184	0.022	0.112	0.101
State characteristics												
Postsecondary capacity	17.276	0.048	4.277	0.000	17.273	0.048	4.272	0.000	17.146	0.048	4.280	0.000
State annual average unemployment rate	-18.681	-0.376	0.770	0.000	-18.680	-0.376	0.770	0.000	-18.672	-0.376	0.771	0.000
Percentage of state residents 25 and older with BA	-3.977	-0.247	0.335	0.000	-3.978	-0.247	0.335	0.000	-3.977	-0.247	0.336	0.000
Log per capita income constant (2006) dollars	2.507	0.508	0.107	0.000	2.507	0.508	0.107	0.000	2.507	0.508	0.107	0.000
Year fixed effects												
Year is 1994	-0.134	-0.067	0.032	0.000	-0.134	-0.067	0.032	0.000	-0.134	-0.067	0.032	0.000
Year is 1995	-0.197	-0.098	0.033	0.000	-0.197	-0.098	0.033	0.000	-0.197	-0.098	0.033	0.000
Year is 1996	-0.229	-0.114	0.033	0.000	-0.229	-0.114	0.033	0.000	-0.228	-0.114	0.033	0.000
Year is 1997	-0.345	-0.171	0.035	0.000	-0.345	-0.171	0.035	0.000	-0.341	-0.169	0.035	0.000
Year is 1998	-0.473	-0.235	0.037	0.000	-0.473	-0.235	0.037	0.000	-0.475	-0.236	0.038	0.000
Year is 1999	-0.494	-0.244	0.038	0.000	-0.494	-0.244	0.038	0.000	-0.493	-0.243	0.039	0.000
Year is 2000	-0.656	-0.322	0.040	0.000	-0.656	-0.322	0.040	0.000	-0.659	-0.323	0.040	0.000
Year is 1993 (ref.)												
R-squared	0.161				0.163				0.161			
N of observations	6192				6192				6192			

Note: Reference group are noted in italics for each categorical independent variable.

Control group excludes Florida competitor institutions and institutions from states that introduced merit-based aid programs before or during the study period.

Source: Analyses of IPEDS 1993 - 2000

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