

THE EFFECTS OF EXCESS HOUR SURCHARGE POLICIES ON STUDENT OUTCOMES

By

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A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF EDUCATION

UNIVERSITY OF FLORIDA

2017

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To Lana

ACKNOWLEDGMENTS

My sincerest appreciation goes to Dr. Isaac McFarlin, my dissertation committee chair. He has closely worked with me since summer 2016 semester and provided me with valuable guidance and feedback, without which I would not have been able to complete my dissertation. Because this was my first academic research, I took wrong approaches and was often at a loss what to do next. Dr. McFarlin patiently explained how to approach research questions and analyze data, offered resource materials, and supported me through the entire dissertation process. I truly enjoyed learning from him and his research expertise.

I also want to thank my committee members, Drs. Dennis Kramer, Justin Ortagus, and Nicholas Gage. Dr. Kramer originally assisted me in finalizing my dissertation topic. I am especially thankful of his advice on requesting institutional data for my dissertation as soon as possible. Thanks to the advice, I was able to obtain the data needed for my study and move onto data analyses fairly quickly. Additionally, I learned a great deal about the field of higher education from LEAD faculty and my cohort members. I will always cherish the four years I spent with all of them.

I would not be able to get through this long journey without my colleagues and friends at my institution. They were always understanding and supportive when I needed to be away from work or I just needed a break from everything. When I returned to work from weekend classes, feeling down and wanting to give up, they always lifted up my spirit and encouraged me to continue.

Last, but not the least, I owe a debt of gratitude to my daughter, Lana, who did not get my full attention over the past four years while I struggled to balance work, school, and family. There were more than a few occasions where we both wondered why I was getting myself stressed and sacrificing my time with her to pursue a doctoral degree. Her support and belief in

me to finish the program got me through the most challenging time in my life. I am the luckiest mother to have such a caring, funny, and intelligent daughter. I cannot wait to make up for the lost time with her after graduation.

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Abstract of Dissertation Presented to the Graduate School
of the University of Florida in Partial Fulfillment of the
Requirements for the Degree of Doctor of Education

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By

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December 2017

Chair: Isaac McFarlin

Major: Higher Education Administration

Facing the increased demand for accountability, colleges and universities nationwide embarked on various initiatives to increase college attainment. One such effort is the Florida state statute, commonly referred to as excess hour surcharge policy, which was implemented at 12 state universities effective July 2009. The Florida legislature intends to incentivize state university students to graduate in an efficient manner to avoid a surcharge per credit. This quasi-experimental study examines the relationship between the introduction of the surcharge policy and baccalaureate degree attainment at one state university. Utilizing institutional data on freshman admission cohorts from summer 2005 to fall 2011, this correlational study focuses on graduation by students across 14 admission cohorts and also by students admitted into science, technology, engineering, and mathematics (STEM) programs. The researcher chose the specific group of students due to the emphasis placed on STEM degree production by the federal government. The analyses utilized a difference-in-differences approach to estimate the relationship between the surcharge policy and college completion.

Overall, the findings suggest that the surcharge policy is positively associated with the likelihood of obtaining a bachelor's degree. Students receiving financial assistance may be less affected by the surcharge policy, because financial aid reduces the cost of a college education.

However, the difference-in-differences estimates suggest that the surcharge policy does not have a differential effect on college completion for students who qualify for financial assistance.

Additional findings suggest that the surcharge policy does not differentially affect students who were admitted under STEM program but has an important differential impact on college completion rates of out-of-state students who face higher tuition prices.

This study offered the first empirical examination of the excess hour surcharge policy at student-level and filled a gap in the literature of higher education policy evaluation. The author concludes this paper by making recommendations for retention programming and future research opportunities to further the understanding of financial policies.

CHAPTER 1 INTRODUCTION

Performance and accountability of higher education institutions have become frequently discussed policy topics among public officials, educational professionals, and other stakeholders in the United States over the past decades (Bogue & Dandridge, 2010). A 2008 national report card on higher education revealed the persistence of poor outcomes in relation to students' college readiness, college access, graduation rates, racial disparities in college degree attainment, and international comparisons of college degree holders (The National Center for Public Policy and Higher Education, 2008). The report called for financial policies at the state level to balance college costs between states, the institutions of higher education, and students and families. The strategized approach would meet the needs of state residents, ensure college access and affordability, and promote degree production. An example of such financial policies, mainly aiming to raise a graduation rate using a financial incentive, is a Florida state statute that is commonly referred to as the excess hour surcharge policy.

Effective July 2009, students enrolled in 12 Florida state universities are subject to a surcharge per credit once exceeding the credit limit set by the state statute. The objective of the state law is to encourage state university students to graduate promptly; failure to do so holds students more financially responsible for their college education by imposing the fee per credit. Florida state residents enjoy a heavily subsidized tuition rate because of state appropriations to public post-secondary institutions. The fact that colleges and universities receive the appropriations directly from the state, not through students, makes such funding invisible to students and their families. Consequently, it is often challenging for them to fully understand the true cost of a college degree (Kane, 1999) and the impact of students' prolonged time to degree attainment on state resources.

Several external factors can be attributed to the 2009 regulation and its amendments in 2011, and 2012. One of the main factors is a low graduation rate, which is also a national concern because of the increased need for college-educated individuals to compete in the global economy (Zumeta, Breneman, Callan, & Finney, 2012) and the amount of tax money spent on excess credits taken by students each year. According to Digest of Education Statistics (National Center for Education Statistics, 2015), the 6-year graduation rates at public 4-year institutions in the United States between the years 1996 and 2008 range from 54.7 percent to 61.2 percent with a small but increasing trend over time.

When limiting the data to 4-year universities in Florida, the national upward trend disappears and paints a different picture. Between 1996 and 2002, the Florida graduation rates fluctuated with a decline starting with the 2001 cohort, after a 4-year continuous increase from 1997 to 2000 (Figure 1-1). After graduation rates had hit the lowest percent at 47.3 percent with a 2003 starting cohort, the rate remained below or less than one percent above the 50-percent mark for the following five cohorts.

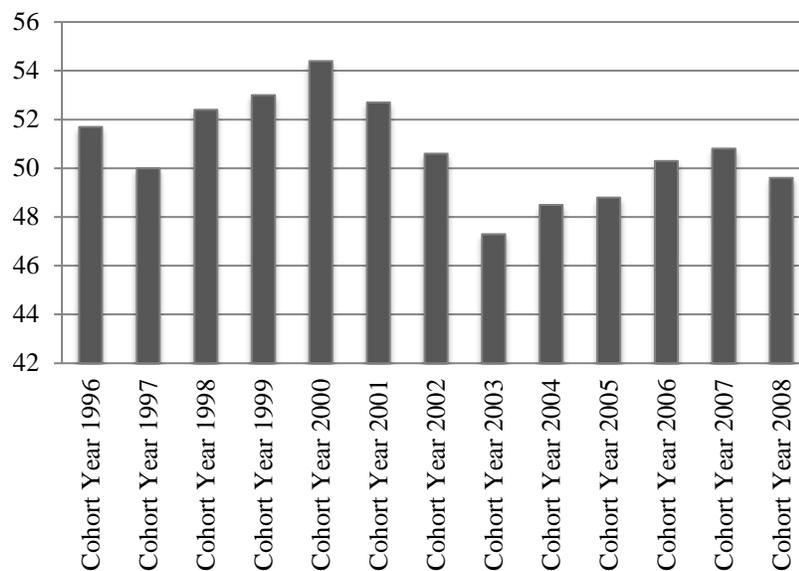


Figure 1-1. Graduation rates (in percent) within 150% of normal time (6 years) at public 4-year postsecondary institutions in in Florida

Another primary factor is the great recession that lasted from December 2007 to June 2009 (Economic Policy Institute, n.d.), and its lasting effects on the financial condition of the state government. The Florida state government continued to reduce the state appropriation for public postsecondary institutions (Table 1-1), generally known as discretionary funding, between the fiscal year (FY) 2007 and 2012 with a mean of -14 percent (Delta Cost Project, 2017; National Center for Education Statistics, 2015). Compared to the FY 1991-1992 when 56 percent of the operation budgets for public postsecondary institutions came from the state, the number went down to 30 percent in the FY 2009-2010 (Research Institute on Social & Economic Policy, 2012.). Given the competing funding requests by other sectors the state government must fulfill, it is highly unlikely that higher education funding will ever increase sufficiently to meet the growing number of college enrollments (Hauptman, 2011). Along with the diminished state funding, colleges and universities face “pressure for greater accountability and efficiency... and the public’s demand for higher education productivity” (Heck, 2009, p. 129).

Table 1-1. Appropriations from state government for public degree-granting postsecondary institutions

	State appropriations			
	1990-1991	2000-2001	2010-2011	2012-2013
United States	\$35,898,653	\$56,268,990	\$63,063,322	\$58,634,157
Florida	\$1,638,218	\$2,656,376	\$3,243,232	\$2,765,668

The 2006 report by the Office of Program Policy Analysis & Government Accountability (OPPAGA) revealed the excess credit hours taken by university students, which cost the state of Florida \$62 million in the FY 2004-2005. The percentage of students who accumulated excess credits for 4-year degrees varies at public universities. In the academic year 2001-2002, 31 percent to 58 percent of students took more than 115 percent of the total credits required for graduation; 21 to 48 percent of students took more than 120 percent of the total credits required for graduation. The variation remained during the academic year 2004-2005 when 30 to 58

percent of students took more than 115 percent of the total credits required for graduation; 22 to 45 percent of students took more than 120 percent of the total credits required for graduation (Figures 1-2 and 1-3). More specifically, Florida State University, with the lowest percentage for the 120 percent standard, had only one-fifth of its students attempting over 144 credits for graduation in the academic year 2004-2005. In contrast, almost a half of the Florida Agricultural and Mechanical University graduates in the same school year completed over 24 credits more than their degree requirements.

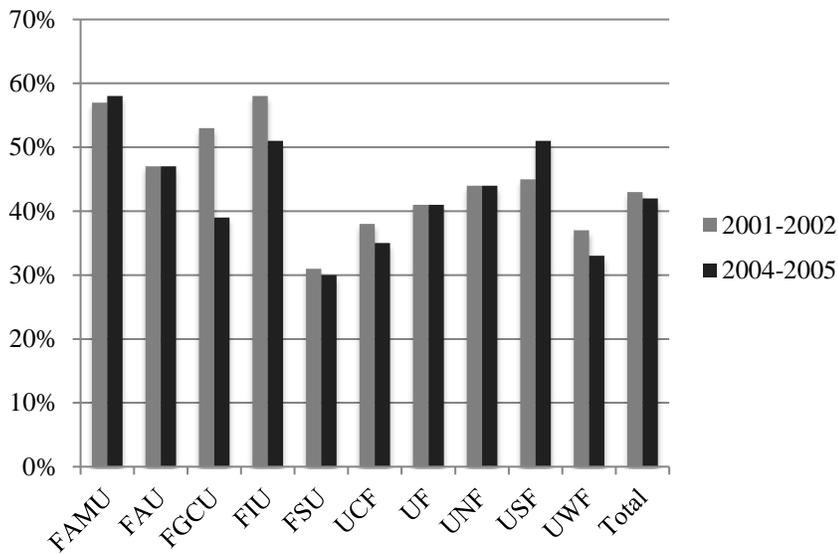


Figure 1-2. Students over 115% (138 credit) standard

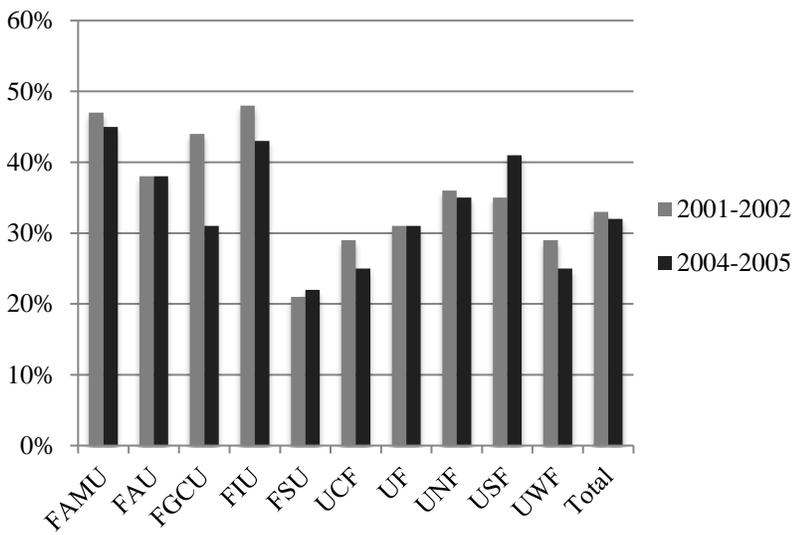


Figure 1-3. Students over the 120% (144 credit) standard

Between the years 2005 and 2014, 5-year graduation rates at 10 Florida public universities ranged from below 30 percent at Florida Agricultural and Mechanical University to over 80 percent at University of Florida (Figure 1-4; National Center for Education Statistics, n.d.). Without significant improvement on degree completion at 6 of the 10 institutions, more than half of these students would face the excess hour fee in order to graduate, increasing financial responsibility during senior year. A troubling fact emerges when examining the percentage of full-time first-time undergraduates receiving student loans and Pell Grants at the 10 universities (Figures 1-5 and 1-6). At the majority of the six universities with a below 50 percent graduation rate, over 40 percent of students rely on student loans and Pell Grants for their postsecondary education. At Florida Agricultural and Mechanical University where the 5-year graduation rate is below 30 percent, approximately 70 percent of students utilize the loan and receive the need-based grant (National Center for Education Statistics, n.d.).

The importance of evaluating the effectiveness of the excess hour surcharge policy cannot be overstated especially because existing literature found that approximately 50 percent of the increased time to degree during the last 30 years can be explained by the rise in college tuition (Denning, 2017). The same study also discovered that additional financial assistance, not surcharge, promoted graduation among seniors as the funds helped them take more credits per semester. The researcher cautioned policymakers to consider the ramifications of their policy decisions on students' time to degree. Nevertheless, no follow-up study or report can be found at the OPPAGA website or in the scholarly literature. Considering the financially punitive nature of the policy to students, it is essential that its impact on meeting the policy objectives be assessed and any unintended consequence from the statute be identified.

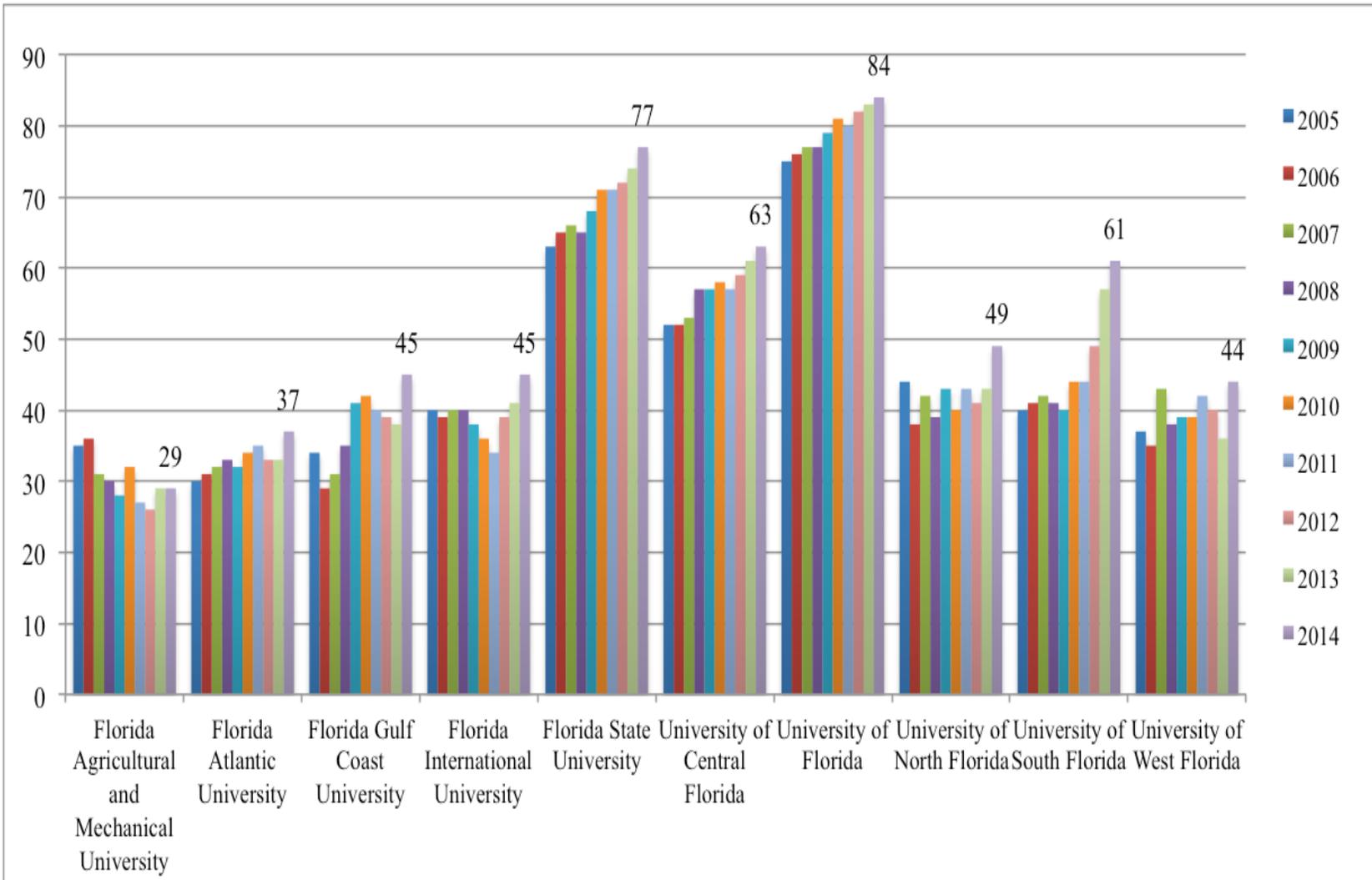


Figure 1-4. Graduation rates – Bachelor’s degree within 5 years by state universities

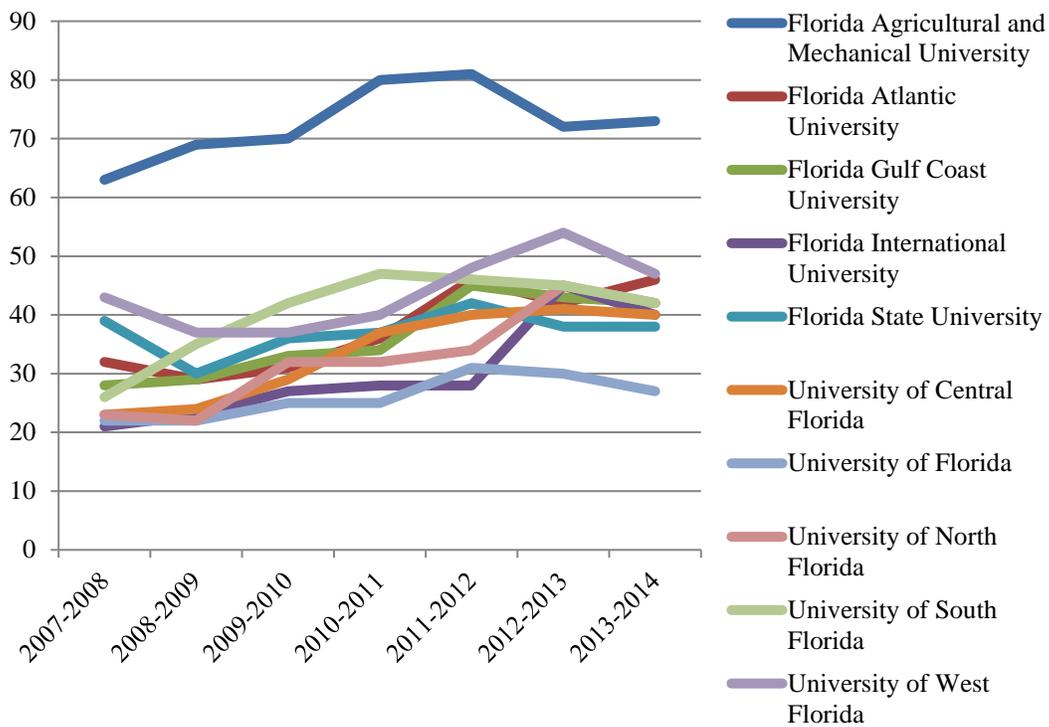


Figure 1-5. Percent of full-time first-time undergraduates receiving student loan

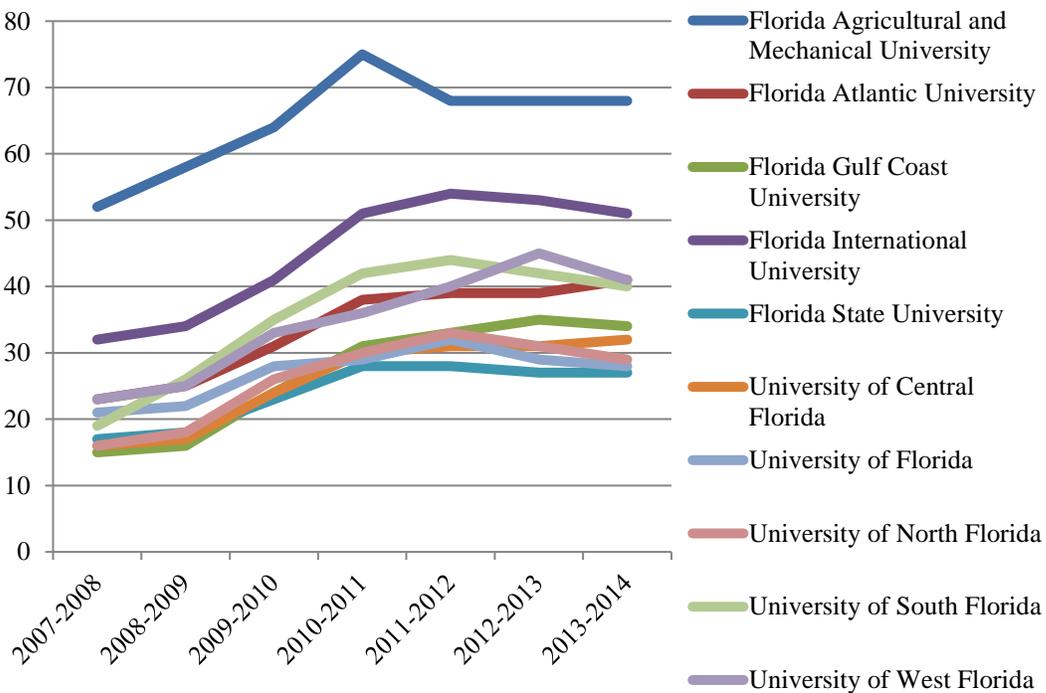


Figure 1-6. Percent of full-time first-time undergraduates receiving Pell Grant

Purpose of the Study

Many initiatives are proposed and underway nationwide to increase college degree attainment. Evaluation of financial policies and initiatives is especially crucial because of ever-increasing college costs and resultant difficulty to students and their families. The high price can counteract the efforts by stakeholders inside and outside of higher education to improve student enrollment and completion and increase science, technology, engineering, and math (STEM) degree production. One of the primary responsibilities of state government is to develop the regulations promoting educational attainment among the entire populations equally (Perna & Finney, 2014). Once implemented, the effects of new policies must be examined to confirm that they accomplish intended goals and do not cause adverse effects, such as widening racial disparities in college degree completion or increasing student debt. Financial policies like the excess hour surcharge statute in Florida can generate unintended negative consequences for students with or without achieving the objectives. Although multiple states including Arizona, Montana, Nevada, North Carolina, Texas, Utah, Virginia, and Wisconsin have employed the excess fee strategy for over a decade to incentivize students for timely graduation, its effectiveness was not explored until recently (Kramer, Holcomb, & Kelchen, 2017).

The purpose of this quasi-experimental study is to examine the association between the excess hour surcharge policy and bachelor's degree completion by the students who matriculated at one of the 12 Florida state universities as a freshman from Summer 2009 to Fall 2011 semesters, controlling for students' demographics, financial aid eligibility, Florida residency status, and academic major at the time of admission. The outcomes of interest were within 4-year and 5-year graduation rates by all majors in the sample and by the students admitted into STEM degree programs. This study chose to examine the college completion by STEM major admits because of the critical shortage of STEM degree graduates in a workforce and a high

attrition rate of STEM freshman admits (National Science Board, 2016). The funding metrics recently adopted by the board of governors for Florida state universities measure each university's performance on STEM degree production annually (State University System of Florida Board of Governors, 2017). It is critical to ensure that one initiative does not have a detrimental influence on another.

Students who are affected by the excess hour surcharge policy receive two-dimensional treatment, such as notifications of the policy by the university and surcharge per credit in excess of the credit limit set by the state statute. Covariates consisted of students' demographics and academic information: gender, ethnicity, socioeconomic status using Federal Pell Grant (i.e., Pell Grant) eligibility, Bright Futures Scholarship program (i.e., Bright Futures) eligibility, GI Bill eligibility, Florida state residency status, and academic major at the time of admission.

Research Questions

The premise of the excess hour policy is that the anticipation of the increased cost of college education brought about by the policy urges students to graduate in a timely manner. This study, guided by two theoretical and conceptual frameworks, human capital and behavioral economics, evaluated the effectiveness of the state statute in affecting students' decision-making and ultimately their college completion.

Human capital theory maintains that individuals develop their human capital through education; therefore, it considers education as an investment. Students and their families must assess costs and benefits of college degrees when making decisions to pursue postsecondary education. Behavioral economics framework elaborates on the cost-benefit analysis by adding psychological factors because decisions related to college education are not as straightforward as purchasing consumer goods but instead involve students' passions, drives, abilities, and more.

The two theoretical and conceptual frameworks combined offer insights into college students' decision-making process.

This study analyzed student outcomes at one Florida public university during the academic years 2005 to 2011. Using institutional student data, it examined the relationship between the excess hour surcharge policy and graduation rates among all students in the sample and the students admitted into STEM programs. Additionally, the researcher assessed how the college outcomes differ based on student characteristics. Specifically, this research asked the following three questions.

1. Does the excess hour surcharge policy affect college completion?
2. Does the excess hour surcharge policy influence college completion of students admitted into STEM majors?
3. Does the association between the excess hour surcharge policy and college completion vary for students eligible for financial aid programs?

The first question evaluated the effectiveness of the policy in meeting its intended objectives. The second question assessed the impacts of the policy on degree completion by STEM major admits. The last question furthered the analyses by taking students' eligibility for financial aid into consideration and examined any interaction effects of the eligibility with the surcharge policy.

Significance of the Study

After the enactment of the state statute in July 2009, little empirical research can be found to demonstrate the effectiveness of the policy in increasing 4-year degree attainment at Florida public universities. Regardless of no evidence of successful outcomes, the policy was amended twice, in 2011 and 2012, lowering a credit limit from 120 percent beyond graduation requirements to 115 percent and then to 110 percent, and raising a surcharge rate from 50 percent to 100 percent of tuition. Given the financially punitive nature of the statute to students as well

as the high student loan debt and default rate the country is carrying, it is essential to understand the impact of the policy on student outcomes. College affordability is another national concern, which the excess hour surcharge can exacerbate. The most recent credit limit, 110 percent, means that students enrolling in a 120-hour degree program would have to start paying a 100 percent surcharge per credit after attempting 132-semester credits. A policy is only partially effective if it achieves its intended objectives but at the same time negatively impacts another area of concern.

Additionally, the state of Florida promotes the increase in Bachelor's degrees within programs of strategic emphasis through a recently enacted performance-based funding metrics (State University System of Florida Board of Governors, 2017.). STEM degree programs play a critical role in meeting the expectation. Considering the technology-driven society we live in, the demand for students with STEM degrees is high, and it is the responsibility of colleges and universities to meet the needs of a workforce. This study examined whether there is a negative association between the excess hour surcharge policy and degree completion by STEM major admits. Research findings offer policymakers either the confirmation that the policy has a positive effects on its intended goals, or the realization that a new approach is necessary to improve college graduation rates without negatively impacting another state agenda, STEM degree production.

The policy may possess different relationships with college completion based on student characteristics as the state universities serve diverse student population. For example, students with financial means may be able to afford the surcharge to complete the degree of their choice regardless of how long and how many attempted credits it takes, while students without financial assistance or those relying on financial assistance such as Pell Grant must carefully plan their

coursework as withdrawals and failing grades can cause them to dropout of college or lose their financial aid eligibility and exhaust all funding. This study examined the interaction effects of the surcharge policy and students' financial aid eligibility on student outcomes in the effort to identify possible unequal impacts of the policy on students. Such examination at student level is critical because for some students, colleges are the first place to explore options, goals, and meanings of their lives (O'Banion, 2012). It is college leaders' responsibility not to sacrifice the opportunity for the efforts to increase degree production.

Findings from the analyses are beneficial to students and guide the practice of student affairs professionals and higher education administrators. If pursuing some academic majors exposes more students to the excess hour fee than other majors, the information make students aware of the risk when choosing those majors and better prepared for the additional cost during their senior years. Student support services can target at-risk students for retention and financial planning programs, assisting them in completing bachelor's degrees within allowed credit hours or as few excess hours as possible. Because the percentage of bachelor's degrees awarded without excess hours is one of the 10 performance-based funding metrics for the university, increased knowledge of the policy impact aid higher education administrators in strategically improving the funding metrics.

Although a number of states adopted strategies using tuition and fee structure as the encouragement for students to graduate promptly, the effectiveness of the approaches remains to be explored. The scarcity of empirical data verifying outcomes from such tuition policies must be corrected. This study filled the gap in the literature in the hopes of improving current practice and instituting a policy evaluation process.

CHAPTER 2 LITERATURE REVIEW

While there is a large body of research available on the relationship between college costs and student retention and graduation, only a few studies focus on the excess hour fee and its effect on student outcomes. The next section provides an overview of the extant literature on the effects of financial policies on college degree attainment and the different types of tuition and fee structures to incentivize students for prompt graduation. The overview presents general knowledge of how financial policies and initiatives affect student outcomes and the results of the few studies on the excess hour fee that were completed at European institutions. The third section discusses the states employing an excess credit surcharge, including the background of the excess hour surcharge policy at Florida public universities. The fourth section shifts the attention towards the importance placed on STEM degree production because of the interest of this study in the association between financial policies and college completion by STEM program admits. The fifth section offers the theoretical frameworks that guide this study and advance the understanding of the effects of the surcharge on college students' decision-making.

Extant Literature on the Effects of Financial Policies on College Opportunities

Student financial assistance from state government is one of the most significant ways that state policymakers can make an impact on student retention and graduation. The Great Recession in 2007 caused financial difficulty not only for higher education institutions but also for students and their families, resulting in a greater need for financial aid (Weisbrod & Asch, 2010). Just as federal financial aid offers shifted from grants to loans (Hendrickson, Lane, Harris, & Dorman, 2013), state financial support for students moved away from need-based to merit-based with the goal of rewarding students for excelling in academics while enrolled in high school and at college. Titus (2009) examined “the relationship between changes in financial

aspects of state higher education policies and the production of postsecondary degrees” (p. 440). He took previous studies on the same topic further by analyzing annual state-level panel data from forty-nine states between 1992 and 2004, and incorporating past policies as well as non-higher education state policies. The study results show “increases in state need-based financial aid have a positive impact on bachelor’s degree production” (Titus, 2009 p. 458).

Additionally, Delaney (2014) studied college affordability trends by examining state appropriations, tuition and fees, and state financial aid. Her findings support Titus’ (2009) research results by showing the negative impact the declined need-based aid has on college opportunities. Her research indicates that current trends in reduced state funding, rising tuition and fees to compensate for the loss of state support, and the drop in state investment in need-based financial aid have alarming implications for college enrollment and affordability. Another study concurred that “a \$100 increase in tuition and fees would lead to a decline in enrollment of approximately 25 students... [while] enrollment is positively related to the amount of financial aid and grant money available to students” (Hemelt & Marcotte, 2011, p. 444).

These findings coincide with the analysis of federal, state, and institutional policies completed in 2007. A decade ago, a researcher already warned, “The failure to align policy choices with policy imperatives has direct and measurable consequences for higher education opportunity, participation and degree production in the United States...contributing directly to growing income inequality in the United States” (Mortenson, 2007, p. 54).

From an economic perspective, Romano (2005) offered a solution to close the gap in access and affordability. He argues that it is not high tuition but limited availability of need-based financial aid that serves as a hurdle for some students to attend or complete a college education. His recommendations include the use of high tuition to increase need-based financial

aid and the change from merit-based back to need-based aid for equal access to all students.

Using student-, institution- and state-level data from the Beginning Postsecondary Students survey, Integrated Postsecondary Education Data System, and the annual National Association of State Student Grant and Aid Programs survey, Titus (2006) examined the factors influencing college completion in 48 states. His findings support Romano's recommendations;

- College completion is positively associated with the percentage of institutional revenue derived from tuition... as institutions increase their reliance on tuition as a source of revenue, they will increasingly focus on retaining students.
- A state's effort with respect to funding for financial aid as a percentage of total spending for higher education positively influences the chance of college completion.
- A state's expenditures with regard to providing need-based undergraduate financial aid helps to further explain differences between states in college six-year completion rates at four-year institutions...highlighting the importance of need-based aid in college attainment. (p. 311)

Extended time students spend on college completion is not a unique problem in the United States. Some research was conducted in Europe to examine the effects of public expenditures, financial incentives, and an excess fee on the time for graduation. Contrary to the findings by Titus (2006) mentioned above, Brunello and Winter-Ebmer's (2003) survey completed by over three thousand undergraduate students in ten European countries found a positive relationship between students' excess time for graduation and higher public expenditures on postsecondary education. They used human capital theory to explain the conclusion, stating that the less the college cost incurred on students, the longer time spent on college completion.

A quasi-experimental study analyzed the relationship between tuition increase after 4 years of enrollment and the speed of graduation at an Italian private university where over 80 percent of students typically take more than 4 years to complete a degree (Garibaldi, Giavazzi, Ichino, & Rettore, 2012). The research resulted in the evidence showing a "1,000 euro increase

in continuation tuition reduces the probability of late graduation by 5.2%” (p. 699). Regardless of the positive impact of tuition increase on the time for graduation, the researchers cautioned that the method might not be the best solution for all students due to individual differences affecting the optimal speed for graduation.

Another study conducted at a German university also examines the effect of an additional fee for students who have not finished their college study within four semesters beyond a standard period of study set by the state (Heineck, Kifmann, & Lorenz, 2006). The researchers found a mixed result for the effect:

In three of the six majors examined, the length of study to obtain a degree is reduced only because fewer long-term students finish with a degree. In particular, the number of dropouts increased. Nevertheless, in two majors we found that the average length of study to obtain a degree decreased because students were actually studying faster. (Heineck et al., p. 104)

The additional fee increased the frequency of students transferring to a university in another state where such fee is not imposed on students as well as students not passing a mandatory exam for graduation (Heineck et al.).

A follow-up study also presented evidence of negative effects of the tuition fee on college enrollment by high school graduates in seven of the 16 German states that instituted the additional charge (Hubner, 2012). These findings act as an important reminder for policymakers that not all students react to a financial intervention in the same manner, and unintended negative consequences such as dropout and non-enrollment could occur. As mentioned earlier, examining policy effectiveness, especially across different demographic groups, is very crucial (Perna, Klein, & McLendon, 2014).

As opposed to the effect of a punishment by the additional fee in the German study, Gunners, Kirkeboen, and Ronning (2013) explored the impact of a monetary incentive, \$3,000

loan forgiveness, on college students' study duration in Norway. Their difference-in-differences framework concludes that the financial incentive was successful in not only increasing on-time graduation but also in reducing delays in graduation. The researchers recommend that such incentive should be introduced to students early in their college career to ensure that they establish the necessary study habits.

Tuition and Fee Structures as Incentives for Graduation

Public universities in the United States utilize three common types of financial incentives to facilitate efficiency in degree production. A summary of the tuition strategies and the states that adopted them is available in Table 2-1.

The first is known as guaranteed tuition with which students can lock in a tuition rate for a set period of time, typically 4 years. In the event that students do not finish their college study within the period, their tuition rate will be adjusted to the higher rate charged to new students for the academic year. With this type of pricing, students can avoid annual tuition increase and have an easier time making financial plans for college cost at the time of entry. However, failure to graduate within the established timeframe causes them to pay more for an additional semester or year than they would do with a different tuition structure (Mullin, Baime, & Honeyman, 2015). The idea of higher tuition supposedly encourages students to be more mindful of staying on track for graduation.

The second type is a flat-rate tuition or marginal pricing. This structure allows students to enroll in over 12 credit hours without any additional charge. Considering the increased concern about rising college tuition and fees, no extra cost for another class is appealing to many students and their families, resulting in a higher credit enrollment per semester, and thereby on-time graduation. The third type, which is the topic of this paper, is an excess hour fee for the credits students take over a certain credit limit. Two studies on this incentive strategy

implemented in European universities were discussed earlier. Much like the guaranteed tuition, the excess fee is expected to deter students from prolonging their college study.

Table 2-1. States' use of different tuition incentives

Tuition incentive	State
Guaranteed tuition	Illinois, Oklahoma*
Block/Flat rate tuition	Alabama, Connecticut, Delaware, Idaho, Indiana, Kentucky, Massachusetts, Minnesota, Montana, North Dakota, New Hampshire, New Jersey, New York, Oklahoma*, Pennsylvania, Rhode Island South Carolina, Vermont, Washington, West Virginia, Wisconsin
Excess hour fee	Arizona, Florida, North Carolina, Montana, Nevada, Texas, Utah,
Differentiated tuition	Hawaii, Michigan, Nebraska, North Dakota, Ohio, South Dakota

*Effective fall 2008, first-time full-time students have two options.

Regardless of the widespread use of the tuition pricing options, little research has been conducted to assess the effectiveness of each approach or compare the effects of each on student outcomes. One study examined the impact of guaranteed tuition on college tuition level in Illinois and identified a negative consequence on college cost (Delaney & Kearney, 2015). The researchers concluded:

Following the implementation of this [Truth-in-Tuition] law, public four-year institutions in Illinois increased their average annual tuition by approximately 26-30%, on average, as compared to institutions not subject to the law, all else equal... institutions raised tuition beyond what would have been necessary in a front-loaded model to keep tuition comparable to a variable rate tuition policy and raised tuition levels overall... guaranteed tuition laws contain incentives for institutions to increase overall tuition levels. (Delaney & Kearney, 2015, p. 92)

Another study conducted on marginal pricing at Michigan public universities reveals the minimal impact of the flat-rate tuition strategy on course completion and on-time graduation in addition to increased withdrawals and lowered grade point average (Hemelt & Stange, 2016).

Excess credits earned by community college students in the United States drew attention to state and institutional barriers such as poor advising, unclear transfer policies, and

unstructured program pathways as reasons behind those additional hours (Zeidenberg, 2012). As long as these obstacles exist, motivating students to stay on track for graduation with the use of a surcharge may not be sufficient to improve college graduation rate and decrease excess hours. A recent study that examined five states adopting the excess fee strategy did not find a significant impact of the strategy on degree completion or time for the completion but instead found the adoption of the policy to increase student loan debt (Kramer et al., 2017).

In sum, the current higher education environment of increased accountability generated new policies at federal, state, and institutional levels. The studies presented in this chapter show that the decline of state need-based financial assistance, rising tuition and fees, and decreased state funding for higher education are all found to be negatively related to college enrollment and completion despite policymakers' intentions to improve college access and affordability. Consequently, it is evident that the implementation of new policies is not the final phase of the policy-making process; evaluations of the policies in regard to their effectiveness, their influence on college degree attainment, and the occurrence of unintended consequences is an essential part of the process. From this point on, this paper focuses on one of the common financial incentives, the excess hour fee, using a Florida state statute as an example, by examining its background and association with college completion.

Excess Hour Surcharge Policy at Florida Public Universities

In July 2009, the state of Florida enacted the state statute 1009.286: "Additional student payment for hours exceeding baccalaureate [bachelor's] degree program completion requirements at state universities" (Florida Legislature, 2017, para. 1). The goal is to encourage students enrolling at one of the 12 Florida state universities to complete a bachelor's degree under the attempt hours set by the statute, thereby reducing the amount of state tax revenue spent

on tuition subsidies. Students going over the limit are responsible for an additional charge per credit hour.

Table 2-2 shows the credit limits and surcharge rates based on a student’s matriculation term.

Table 2-2. Excess hour surcharge policy thresholds and fees in Florida

Matriculation term	Fees* to be charged
Prior to fall 2009	None (exempt)
Fall 2009 – Summer 2011	50% for credits above 120 % of program (144 credits for a 120-credit hour program)
Fall 2011 – Summer 2012	100% for credits above 115% of program (138 credits for a 120-credit hour program)
Fall 2012 and thereafter	100% for credits above 110% of program (132 credits for a 120-credit hour program)

* The fee is assessed only on the tuition portion of the credit hour cost, not on fees

The idea of the surcharge was brought up in discussion among state policymakers even before the Great Recession in 2008. In 2004, considering the projected faster growth in student college enrollment in public 2- and 4-year institutions and the \$62 million spent on excess credits by students during the 2002-2003 academic year, the state legislature contemplated stronger financial incentives to promote bachelor’s degree completion with fewer excess hours (OPPAGA, 2004). Three incentives proposed in the report were as follows:

- Charging the full cost for credit hours in excess of 115% of graduation requirements
- Providing tuition rebates to students who graduate with minimal excess hours
- Offering “locked-in” tuition, under which students who do not graduate within 4 years would pay the higher tuition rates charged to new students. (p. 1)

The report includes data on successful implementation of the options by other states, such as Texas and North Carolina regarding the first option, Texas the second, and Illinois the last. The report states the potential amount of money the state would save using the first and second options (i.e., \$29 million annually and \$3.5 million annually, respectively) and the negative

impact the lock-in rate approach could have on part-time students without offering any solutions for those students.

Additional reports by the OPPAGA in the following years presented the astounding amount of money the state spent on excess hours (2005, 2006). The report completed in April 2005 analyzed a cohort of 2001-2002 graduates from Florida community colleges and determined that “61% of the graduates accumulated hours that exceeded 120% of degree requirements... cost[ing] the state about \$30 million” (p.1). The 2005 report listed inadequate academic advising and student characteristics such as age, marital and employment status, college readiness, and English proficiency as the main causes of excess hours at community colleges and recommended strengthening advising and providing institutional and student-based financial incentives.

The Florida state legislature passed SB2236 in 2005, holding students financially responsible for 75 percent of the actual cost of instruction for each credit taken over 120 percent of degree requirement. However, Governor Jeb Bush vetoed the bill because of his concern for community college students who already face several obstacles for degree completion without the additional one of higher tuition. The report included a response letter from the Commissioner of Education, which expresses his concerns about unintended consequences, such as increased financial hardship on students and discouragement for students to change their majors and improve basic skills in English and mathematics for academic success (OPPAGA, 2005). Another bill, SB 246 - similar to SB 2236 - was deliberated during the 2006 legislative session but was not successful (OPPAGA, 2006).

The 2006 report steered its focus from 2-year schools to 4-year institutions and announced that the excess hours earned by students in Florida public universities cost the state

\$62 million in FY 2004-2005 (OPPAGA, 2006). More importantly, the report discovered that only 20 percent of the students with excess hours are responsible for over 58 percent of all credit hours completed beyond graduation requirements but did not address the effectiveness of interventions recently implemented by universities, as it was too early to measure the impact on students and graduation rate.

During the 2009 legislative session, HB 7109 bill passed under another governor, Charlie Crist, with an effective date of July 1st, 2009, requiring students who matriculate as a freshman at a Florida state university or state college for the first time in fall 2009 or thereafter to pay a fee equal to 50 percent of the tuition rate for each credit in excess of 120 percent of the required program hours with the following exceptions:

- (a) College credits earned through an articulated accelerated mechanism
- (b) Credit hours earned through internship programs.
- (c) Credit hours required for certification, recertification, or certificate programs.
- (d) Credit hours in courses from which a student must withdraw due to reasons of medical or personal hardship.
- (e) Credit hours taken by active-duty military personnel.
- (f) Credit hours required to achieve a dual major taken while pursuing a baccalaureate [bachelor's] degree.
- (g) Remedial and English as a Second Language credit hours.
- (h) Credit hours earned in military science courses that are part of the Reserve Officers' Training Corps (ROTC) program. (Florida Legislature, 2017, para. 4)

Since its enactment in 2009, the statute has been amended twice in 2011 and 2012, lowering the credit limit from 120 percent of the program hours to 115 percent and then to 110 percent, while at the same time raising the surcharge rate from 50 to 100 percent. Regarding the amendments, the House of representative staff analysis (2012) states:

Although the fiscal impact of the surcharge has not been realized to the full extent, OPPAGA has estimated that reducing the allowable credit hours to 110% will further reduce the state's burden by an additional \$11 million in Fiscal Year 2012-13. Increasing the applicable excess credit hours for the surcharge is anticipated to bring in additional revenues of \$11 million to be generated for universities. These revenues are anticipated to decrease as students modify their behavior in an effort to avoid having to pay for this charge. Should a significant number of affected students graduate sooner, this [reduced allowable credit hours] would contribute to the efficiency of the system by freeing up capacity and increasing graduation rates. (p.15)

Policymakers submitted HB153 and SB2 for consideration during the 2017 Florida legislative session. The HB153 originally proposed to increase the 115 percent credit limit back to 120 percent for students who matriculate at a Florida public university or college in August 2011 and thereafter. The final version of HB153 instead recommended two amendments, exempting students from the surcharge if they complete a bachelor's degree program within 4 years and also excluding from allowable credit counts attempted credits in upper level courses required by STEM majors (Excess Credit Hour Surcharges, 2017). However, the bill was withdrawn from further consideration in the Senate during week six of the legislative session.

Almost 8 years have passed since the enactment of the excess hours surcharge statute in 2009; however, only one empirical study can be found that evaluates the policy's effectiveness and unintended consequences negatively affecting students. As discussed earlier, it is imperative that new policies be evaluated after implementation and adjusted accordingly. A comparison of the states utilizing the excess hour surcharge as an incentive shows variations in credit limits and fees imposed on students. Table 2-3 summarizes the differences among seven states. A further review of the state policies reveals that some states allow students to petition for a waiver of the surcharge; also, some states exclude certain credits from what counts towards credit limits (Table 2-4). The exemption of certain credits shows that state's attempt to attain an optimal balance

between the intent to reduce the number and cost of unnecessary credits and the intent to avoid increasing the financial burden on students.

Table 2-3. Excess hour thresholds and fees in seven states

State	Effective term	Threshold	Fees
Arizona	Fall 2005	145 credit hours	\$135 per credit for Arizona resident up to \$945 for enrollment in 7 or more hours; \$207 per credit up to \$2,484 for enrollment in 12 or more hours
Florida	Fall 2009	120% of hours required for graduation (matriculation between fall 2009 and summer 2011); 115% of hours required for graduation (matriculation between fall 2011 and summer 2012 115); 110% of hours required for graduation (matriculation in fall 2012 and after)	50% of tuition (matriculation between fall 2009 and summer 2011); 100% of tuition (matriculation in fall 2011 and after)
Montana	Fall 1999	170 attempt credit hours	Non-resident rate
Nevada	Fall 2014	150% of hours required for student's program of study	\$103.63 per credit
North Carolina	Fall 2009	140 credit hours or 110% of the programs officially designated by the Board of Governors as a 5-year program	25% of tuition prior to the 2010-2011 academic year; 50% with the 2010-2011 and after
Texas	Fall 1999	Over 45 credits above required for completion of the degree program (matriculated during fall 1999 through summer 2006); Over 30 credits above required for completion of the degree program (matriculated during or after fall 2006)	Non-resident rate
Utah	Spring 2003	125% of a student's program of study	Double the current year's resident rate

Table 2-4. Appeal process and exempt credits for excess hour counts

	Arizona	Florida	Montana	Nevada	North Carolina	Texas	Utah
Appeal process	No	No	Yes	Yes	Yes	No	Yes
College credits earned in high school		Exempt		Exempt if not meeting the degree requirements	Exempt		Exempt
Internship		Exempt					
Certificate courses	Exempt	Exempt					
Withdrawn courses due to hardship		Exempt					
Courses taken during active military duty		Exempt					
Double major/degree							
Remedial/ESOL courses		Exempt		Exempt		Exempt	
ROTC program courses		Exempt					
2 nd bachelor's degree	Exempt						
Transfer course from private school	Exempt		Exempt	Exempt if not meeting the degree requirements		Exempt	
Transfer course from out of state school	Exempt		Exempt	Exempt if not meeting the degree requirements		Exempt	
Non-transferrable credits	Exempt						Exempt

College Completion by Students Admitted under STEM Programs

This study pays special attention to the bachelor's degree graduation by students admitted into STEM degrees and the possible correlation of the excess hour surcharge policy with the completion. While colleges and universities are often assessed in terms of affordability, retention, and graduation, STEM degree production is also a crucial college outcome because our society increasingly relies on technology (Xue & Larson, 2015). More importantly, the national and workforce shortage in STEM graduates generate concerns for the United States to remain competitive in the global economy (President's Council of Advisors on Science and Technology, 2012). Past research reports alarming data that the United States is losing its competitiveness in the global marketplace (Heilbrunner, 2011; Morganson, Major, Streets, Litano, & Myers, 2015; Zimenoff, 2013) and must produce STEM professionals in a faster rate (Xue & Larson, 2015).

Regardless of promising employment and financial outlooks for the individuals who earn college degrees in the disciplines, the attrition rate of STEM freshman admits between 2003 and 2009 was 48 percent: 20 percent left colleges altogether, and the remaining 28 percent switched to non-STEM majors (National Science Board, 2016). Various studies have identified the factors that increase or decrease STEM retention rates and made recommendations. Several researchers found an early intervention to be a key for students to successfully complete STEM programs. Such interventions should occur early during students' academic career during high school years or freshman year in college (Kokkelenberg & Sinha, 2010; Kolvoord et al., 2016; Perez, Cromley, & Kaplan, 2014) and offer STEM-bound students the opportunity to learn the expectations and challenging nature of the disciplines (Shaw & Barbuti, 2010, Wilson et al., 2012), get involved in real-world applications (Morganson, et al., 2015), and receive mentorships and networking in the STEM fields of their interests (Windsor et al., 2015, Zimenoff, 2013).

With faculty support, introductory science courses can serve an ideal venue for initial STEM retention efforts. Dai and Cromley (2014) proposed that:

educators should teach students to view feedback and grades as an evaluation of previous performance, an opportunity to put more effort into learning, and the beginning of improving achievement, rather than a conclusion about intelligence or ability in the STEM fields. (p. 245)

An additional study concurred that how successful students are in gateway science courses predict the likelihood of them graduating with STEM degrees (Ehreneberg, 2010). Another important role the entry-level courses can play is to direct non-STEM majors who display STEM-related talent towards STEM degrees as one study result indicates that students who were not originally STEM majors are more successful in STEM programs upon changing their majors (Whalen & Shelley, 2010).

Another discouraging aspect of STEM professional shortage is gender and racial disparity. Women, African Americans, Hispanics, and Native Americans continue to underrepresent STEM majors and workforce (Allen-Ramdial & Campbell, 2014; Fischer, 2017; Hill, 2017). Previous research reveals that being the underrepresented status is a predictor of dropping out of STEM programs (Shaw & Barbuti, 2010; Whalen & Shelley, 2010). These findings call for differential intervention strategies to promote STEM retention and graduation among this group of students. Examples of successful retention programs targeting female and minority students are living learning community models to create the sense of community (Dagley Georgiopoulos, Reece, & Young, 2016) and lecture class assignments of female students with higher ability peers (Fischer, 2017).

Other contributing factors to the high STEM attrition rate are related to college costs. Given the fact that STEM discipline courses are more challenging than non-STEM coursework, students face a higher probability of attempting more credit hours for graduation. Students'

perception of cost for STEM degrees is found to play an important role in their decisions to remain enrolled in STEM majors (Perez et al., 2014). Additionally, Medsker et al. (2016) emphasized the importance of making scholarships available for students with unmet financial needs because of their at-risk status for retention. An inclusive scholars program that provides students with not only mentorship, a career preparation seminar, and cohort activities but also scholarships to cover unmet financial needs successfully improved students' persistence and performance in STEM programs. Other research findings support the need to enhance institutional support for STEM students financially as well as academically (Ehrenerg, 2010; Watkins & Mazur, 2013; Whalen & Shelley, 2010).

Different initiatives are ongoing to improve the efficiency of postsecondary institutions. While one effort yields an intended outcome, it may also exacerbate another area of concern. Added college cost based on the excess hour surcharge policy can negatively influence students' decision to pursue or remain as a STEM major. The aim of this study is to ensure that the surcharge policy does not cancel out the accomplishments by STEM retention programming.

Theoretical and Conceptual Frameworks

The researcher relies on two theoretical and conceptual frameworks, human capital theory and behavioral economics framework, to evaluate the effectiveness of the excess hours surcharge policy on impacting student decision-making and ultimately student outcomes.

Human Capital Theory

Although individuals enjoy multiple benefits from postsecondary education, the primary one is a higher income expected after college graduation compared to the one earned by high school graduates. Recent studies show that regardless of rising college tuition and fees, college education remains a good investment, yielding a higher earning for college degree-holders (Abel & Deitz, 2014; Daly & Bengali, 2014; Webber, 2016). Because of the unwavering economic

returns of college education, students and their families focus more on evaluating the cost than the benefits of college education when considering college opportunities. Need-based financial assistance and college tuition discussed in the previous section of this chapter are the main factors in such an evaluation process. Transparency of colleges and universities promoted by the federal and state governments, especially in relation to access and affordability, provides the necessary data for students to assess the costs of higher education.

Human capital theory developed by Theodore Schultz and Gary Becker in the 1960s regards education as an investment, through which an individual increases his productivity and earning potential in the future (Tan, 2014). According to the theory, a cost-benefit evaluation determines how much students decide to invest in the development of their own human capital, mainly knowledge and skills. An additional cost based on the excess hour surcharge policy possibly affects the evaluation and alters students' college outcomes. Students typically learn about the policy when they matriculate at a Florida state college or university. Therefore, the cost-benefit evaluation at that point does not involve college application decisions but academic major and course selection decisions.

Advocates of the human capital theory would argue that individuals try to maximize the return of their investment in education and make their cost-benefit assessment to minimize the cost at the same time increasing or retaining future benefits. The excess hour surcharge, therefore, should cause students to commit to a program of study early on, take no more courses than necessary for graduation, change out of the academic major that would result in the surcharge, and complete a degree in a timely manner. By doing so, they would attain a 4-year degree with the least amount of money and time and join a workforce to start enjoying the main benefit of postsecondary education.

Why, then, do less than 60 percent of students at Florida public universities graduate within six years? Decisions related to college education involve more than cost-benefit calculations; students take into consideration their passions and drives, their abilities, and the expectations and pressures from family and peers. Those factors often surpass the cost-benefit evaluation and bring about students' acceptance of bearing a higher college cost to achieve their individual goals. Behavioral economics, the second theoretical framework that guides this study, offers additional insights into students' decision-making process.

Behavioral Economic Framework

Behavioral economics is a sub-discipline of economics introduced by Daniel Kahneman who incorporated concepts from social sciences such as psychology and sociology to advance the understanding of human behavior and the decision-making process. Two concepts in behavioral economics that are of particular interest in this study are bounded rationality and intrinsic motivation.

The conventional economic theory assumes unbounded rationality, meaning “people know their preferences and are able to evaluate their options completely, even for goods and services that they have never experienced... [and they] are capable of performing complex mental calculations involving time preferences, probabilities, and the expected utility of the outcomes” (Jabbar, 2011, p. 446). Alternatively, behavioral economists propose the term “bounded rationality,” that individuals do not always have consistent or well-defined preferences and also have limited resources, namely time, information, and brainpower, for problem-solving and decision-making. In addition, in contrast to the unbounded willpower asserted by the standard economic model, behavioral economists maintain that individuals' decisions are dependent on loss aversion, social contexts, and their background (Cremene, 2015; Jabbar, 2011).

Students now have the opportunities for career information, counseling, and exploration through various methods during their high school years and have some idea of future career options by the time they enter college. It is not uncommon for students to decide to take a different path or realize their chosen paths are unattainable once in college. Florida university students' decision to change their academic major or repeat unsuccessful courses multiple times to stay in their current major must take the excess hour surcharge into account. The complexity of understanding the impact of the excess hour surcharge policy comes from the fact that the surcharge is not an immediate consequence, as it does not start until students use up all allowed credits, 132 attempt hours for current students. It can be perplexing for freshman or sophomore students to fully understand the consequences of their decisions when they will not experience them until a few years later.

To make matters more complicated, the true cost of college education is not well known by students and families. They are familiar with the sticker price of tuition and fees, which is far below the actual cost of a college degree. The study conducted on state subsidies in 2006 revealed that in the FY1997-1997, the average amount of tuition paid by students at a public 4-year school was \$2,975. The amount was merely one-fifth of the average educational expenditure per full-time equivalent student (Kane, 2006). State appropriations, federal grant and student loan, and institutional scholarship programs cover the remaining balance of the cost. What the excess hour surcharge policy does is to change the proportion by shifting the financial responsibility of college education from the state government to students. The complexity and unfamiliarity of the actual cost of college can contribute to further confusion in students' cost-benefit evaluation.

Additionally, social contexts and background have a strong influence on college students' decision-making. They belong not only to their college community as a whole but also to sub-communities such as student organizations, fraternities and sororities, athletic teams, and so on within the school. The memberships are often based on students' academic majors. Even though a change of major allows students to graduate in a normal time frame and avoid the excess hour fee, some may feel reluctant to leave their familiar environment for a new, unfamiliar one to start over.

The second behavioral economic concept useful in this study is intrinsic motivation. People possess an internal drive to behave in a certain way in addition to external influences or rewards. Such extrinsic rewards may generate intended outcomes or cause damage to intrinsic motivation. One study examined the effect of a fee on the parents who often pick up their children late at a day care facility (Gneezy & Rustichini, 2000). Their findings show that after the introduction of the fee, parents arrived at the center late more often, losing the intrinsic motivation to get there on time and instead considered the late pick-up as a service available to them through the fee.

If this study finding is applied to the excess hour surcharge policy, students may lose their internal drive to graduate in a timely manner and feel entitled to take their time in completing 4-year degrees because they carry more cost, the surcharge, for their degrees. Alternatively, students simply choose their intrinsic motivation to graduate with a degree of their choice regardless of the time it takes over the extrinsic reward to avoid the surcharge by graduating within the credit hours allowed by the state statute. From this perspective, the statute may not impact all students and their college outcomes in a uniform manner, as it is intended to. Students' intrinsic motivation plays a major role in their cost-benefit evaluation of a college

education. For these students who are already enrolled in college, the benefit is no longer about whether to attend college or not, but about which academic major would maximize their aspirations and future earnings.

The two theoretical frameworks together offer enhanced understanding of students' behaviors and decision-making process that influence their college outcomes. Researchers advocate for the inclusion of the behavioral economic framework: "We need behavioral education economics to further our understanding of the complexity of educational decision making... [and] also need it to formulate educational policy and to expand our knowledge of which educational interventions might possibly work and which not" (Koch, Nafziger, & Nielsen, 2015, p. 14). Such proponents of the framework exist worldwide, recommending the use of the behavioral economic concepts in examining the complex dynamics of public institutions (Cremene, 2015; Guzavicius, Giziene, & Zalgiryte, 2014).

Summary

Many approaches to increase the efficiency of colleges and universities are proposed and underway by various stakeholders inside and outside of higher education. Although one approach does not fit all schools due to the differences in the type of institutions, local needs, students, and oversight structures, higher education institutions can and should learn from one another to increase college degree production and contribute to the country for maintaining its competitiveness in the global economy. As discussed earlier, policymakers and higher education leaders must evaluate the effectiveness of new initiatives as they often affect a great number of students, particularly already disadvantaged students. The data should be shared and compared to alternate strategies implemented by other institutions in terms of the increase in degree completion.

The assessment of any new financial policies is especially important considering that the number of individuals living below the federal poverty line has not decreased since the Great Recession in 2009 (Kneebone & Holmes, 2016) and also that the student loan debt the country is now carrying amounts to \$1.2 trillion, and approximately 40 percent of all loans are not repaid (Ark, 2016). In a recent article in the Chronicle of Higher Education, a private university president holds political leaders accountable by stating:

Dealing with the growing income and wealth inequality is the job of state and national political leaders, and it is up to us to ensure that they accept that burden, rather than shoving all of the responsibility for college affordability back on us. (Farish, 2016, para. 14)

Higher education's loss of state funding has been allocated to Medicaid and correctional facilities: the former's share of general fund spending has more than doubled, and the latter's share has surpassed higher education in 11 states (American Academy of Arts & Sciences, 2015). If colleges and universities had adequate resources to support students through completion, secondary consequences would be a smaller number of people being incarcerated and also needing state-funded health insurance.

Recent findings reveal troubling facts in regards to the college graduation rate. According to the report "Rising Tide II: Do Black Students Benefit as Grad Rates Increase?" one-third ($n = 73$) of the 232 institutions that raised overall graduation rate between 2003 and 2013 did not make the same improvement for African American students as they did for Caucasian students, thus widening the graduation rate gap between the two racial groups (Nichols, Eberle-Sudre, & Welch, 2016). Another article indicates a higher dropout rate among first-generation students (Dynarski, 2016). The assessment of new policies and programming to ensure the success of all students cannot be overstated.

CHAPTER 3 RESEARCH METHODOLOGY

The objective of this study is to examine the effects of the excess hour surcharge policy on student outcomes at a Florida public university. Ideally, the effectiveness of the policy could be measured in a longitudinal study where randomly selected students had to pay a surcharge for excess credits (i.e., treatment group), while others were exempt from the additional fee regardless of the number of credits they attempted (i.e., control group). Researchers would monitor the academic progress of students in the two groups, compare their educational outcomes in 6 years after their college entrance, and determine the impact of the policy. In reality, the Florida statute applies to all students who matriculate as a freshman at Florida public 2- and 4-year colleges after July 2009; therefore, a randomized experiment is infeasible. However, students who started their college career before Fall 2009 semester are exempt from the policy. Instead of random assignment, researchers could estimate policy effectiveness by using pre-Fall 2009 enrollees as a control group and compare their college outcomes to the outcomes of those admitted after the policy implementation to estimate the policy effectiveness.

In addition to comparing within 4- and 5-year graduation rates for all students and, specifically, students admitted into STEM majors before and after the introduction of the policy, this study examined the association of the policy with the outcomes, controlling for student's demographics, financial aid eligibility, Florida residency status, academic major at the time of admission, and college credits earned while in high school. Understanding the relationship between the policy and the outcomes will provide college leaders and policymakers with increased knowledge to achieve improved efficiency in higher education performance. To that end, this study addressed the following three questions:

Research question 1: Does the excess hour surcharge policy affect college completion?

Research question 2: Does the excess hour surcharge policy influence college completion of students admitted into STEM majors?

Research question 3: Does the association between the excess hour surcharge policy and college completion vary for students eligible for financial aid programs?

This chapter offers the outline of this study's methodology, including institutional setting, the description of sample, data collection, variables, research design, and limitations.

Institutional Setting

This study was conducted at one of the 12 public universities in Florida. The university serves approximately 16,000 students with 81 percent undergraduate student enrollment. The institution offers 116 undergraduate academic majors in various disciplines, such as business, computing, construction, engineering, fine arts, education, health, natural science, and social science. The majority (i.e., 76 percent) of undergraduate students are 24 years and younger, and 56 percent of the students are female. Almost 70 percent of the undergraduate students enroll in full-time, and more than 90 percent of students are residents of the state. The faculty to student ratio is 1:18. The undergraduate student body is 68 percent Caucasian, 9.6 percent African-American, 9.6 percent Hispanic, 5.1 percent for multiple races, 4.4 percent for Asian, and 0.1 percent each for American Indian/Alaskan Native and Native Hawaiian or other Pacific Islander. Nearly one third (i.e., 31 percent) of undergraduate students receive Pell Grants for their college education, and 39 percent of undergraduate students depend on federal student loans to pay college costs (National Center for Educational Statistics, n.d.). Six-year graduation rates have fluctuated between 45 percent and 55 percent in the last 10 years. STEM degrees have accounted for 10 to 13 percent of all bachelor's degrees earned each year during the last 5 academic years.

Description of Sample

The study sample consisted of 19,760 students who matriculated at a Florida public university as freshmen between the Summer 2005 semester and the Fall 2015 semester. To be considered as a freshman at the institution, students must have no more than 30 semester credits earned through accelerated mechanisms, such as participation in dual enrollment, advanced placement courses, and the International Baccalaureate, while in high school. Admission decisions on freshman applications are based on high school GPA, SAT or ACT scores, and college credits earned if applicable. See Appendix A-1 for academic profiles and admission selectivity for fall freshman admission cohorts.

The exclusion of transfer students with more than 30 college credits from the sample was necessary to keep the knowledge of the excess hour surcharge policy consistent among the sample. Because the surcharge applies to students attending Florida public universities only, transfer students from public state colleges are often unaware of the policy and the implications of their attempted credits prior to transferring to a Florida public university. To effectively assess the impact of the policy on students and their college outcomes, this study focused on the students who enrolled in the university as a freshman, were advised of the policy at freshman orientation, and received multiple reminders of the policy in the same manner throughout their years at the university.

Of the 19,760 freshman matriculants between the Summer of 2005 and the Fall of 2015 semesters, 8,265 students successfully attained 4-year degrees from the university as of December 2016. The remaining students either left the university without completing a bachelor's degree or were still working on their undergraduate study at the university when the data was collected. For data analysis, the researcher divided the sample into cohorts based on matriculation terms. The data included freshman that enrolled in Summer 2005 to Fall 2015

terms; and the university admits freshmen for summer and fall semesters only. The sample, therefore, had 22 cohorts. This study mainly relied on student data from Summer 2005 to Fall 2011 cohorts, as students in Fall 2012 to Fall 2015 cohorts had not spent as much time to complete their 4-year degree at the time of data collection.

Data

The researcher obtained student information from the Office of Institutional Research at the university. The data originally collected for institutional purposes were de-identified by the office. Regardless of the researcher's access to student data, it is impossible to cross-reference the data and re-identify individuals. Additionally, a password was added to the data file as a precaution to protect the sensitive information.

The student data for analysis can be grouped into three broad categories: demographics, admission-related, and financial aid eligibility. The first category consists of students' gender, race, and birth year, which were extracted from online applications to the university. The second category includes terms of admission, academic major admitted into, attempted and earned credits at the time of admission, college credits earned while in high school, and state of residence at the time of application. The third category indicates students' eligibility for Bright Futures, Pell Grant, and GI Bill benefits.

Dependent Variables

The dependent variables are 4- and 5-year graduation rates.

Graduation rates

This study examined 4- and 5-year graduation rates by the analytical sample that includes Summer 2005 to Fall 2011 admission cohorts. The graduation rate was based on the length of time between student's admission term and his or her graduation term. The students who completed a bachelor's degree within 4 and 5 years were counted, while students who left the

university without a 4-year degree or spent more than 5 years on the degree were excluded. For example, Fall 2005 matriculants were included in the Within 4-Year Graduation Rate if they completed bachelor's degrees no later than Summer 2009 or were included in the Within 5-Year Graduation Rate if they finished bachelor's degrees between Fall 2009 and Summer 2010 terms. The intent of the policy is to increase college graduation rate by the financial incentives of the credit limits and surcharge. Therefore, this study examined the graduation rates between Summer 2005 and Fall 2011 admission cohorts in expectation of increasing rates as a result of the policy implementation and adjustments.

College completion by STEM major admits

Considering the need of workforce for STEM degree graduates and the importance for colleges to retain students interested in STEM fields (President's Council of Advisors on Science and Technology, 2012), the author found it critical to evaluate the relationship of the excess hour surcharge policy with bachelor's degree completion by students admitted into STEM programs. Specifically, this study considered biology, chemistry, civil engineering, computing, electrical engineering, mathematics, mechanical engineering, physics, and statistics as STEM majors.

Independent Variables

Student status with the excess hours surcharge policy served as an independent variable in this study. Those who are affected by the policy receive two-dimensional treatments: notifications of the policy by the institution and surcharge upon exceeding a credit limit.

Notification of the policy

Section 1009.286 Florida statutes require state universities and state colleges to establish a process to inform students of the excess hour surcharge policy twice: once when students enroll at a Florida public postsecondary school and a second time as they near the minimum number of credit hours required for a bachelor's degree. Upon formal admission to the university, students

receive multiple registration holds on their accounts and must clear all of the holds before they register for classes for the first time. One of the holds serves as the initial notification required by the state law. Because withdrawing from a course increases the likelihood of students going over the allowed hours, students attempting to withdraw will again encounter the informational hold that serves as a reminder of the policy.

Additional notifications are emailed to students, encouraging them to meet with an academic advisor, when they reach attempted credits equal to 90 percent of program hours and again when they attempted credits equal to 100 percent of program hours. The initial and additional notifications are included in Appendix.

Surcharge over the credit limit

Student's matriculation term at a Florida public postsecondary institution determines a credit limit and a surcharge rate for each credit a student takes over the limit. The surcharge is based on a tuition portion of the credit cost, excluding fees. The credit cost used for surcharge calculation is a tuition rate for the academic year during which a student exceeds the credit limit. Table 2-2 summarizes four levels of the credit limit and three levels of the surcharge.

Covariates

Postsecondary institutions in the United States continue to serve diverse student population, and college outcomes vary among student subgroups (Complete College America, 2011). Consequently, the researcher included student characteristics in this study to determine whether certain characteristics have different impacts on the college outcomes of interest. Demographic, college credits earned while in high school, and academic major at the time of admission functioned as control variables.

Gender and ethnicity

The demographic information is self-reported by students on their applications to the

university. Options for the gender variable are male or female, and options for the race variable are: American Indian, African American, Asian/Pacific Islander, Caucasian, Hispanic, multiple, and non-resident alien for the race variable.

Out-of-state residency status

A student whose parent, legal guardian, or spouse has “established legal residence in this [Florida] state and maintained legal residence in this state for at least 12 consecutive months immediately prior to his or her initial enrollment in an institution of higher education” (Educational Scholarships, Fees, and Financial Assistance, 2002, para 2) receives a subsidized tuition rate at public colleges and universities in Florida. An out-of-state student pays full costs of instruction, approximately three times more than Florida residents. The higher cost of college education may play a role in the retention and graduation of students. Student’s state of residence at the time of application to the university was used to identify one’s Florida residency status for tuition purposes.

Pell Grant eligibility

Yes/no indicators are based on a student’s eligibility for the financial aid at least one semester during enrollment at the university. Eligibility for Pell Grant, a need-based grant program issued directly to students by the government, served as an indicator of student’s family income level. Award amount is determined by the student’s financial need, the cost of attendance, enrollment status (i.e., full-time or part-time), institution type, and student’s attendance of full academic year or less. The amount was between \$313 and \$5,815 during the 2016-2017 school year. Effective July 2012, students may receive Pell Grant funds no more than 12 full-time semesters or 6 years (Federal Student Aid. An office of the U.S. Department of Education, n.d.). Students are responsible for repaying all or a part of the grant when

withdrawing from courses early, changing enrollment status, or qualifying for additional financial assistance.

Bright Futures eligibility

Similar to Pell Grant eligibility, yes/no indicators were used to show students' eligibility for the merit-based program during at least one semester of attendance at the university. Florida high school graduates can qualify for the scholarship if meeting the initial eligibility requirements based on high school GPA, ACT or SAT score, and community service hours. For renewal of the scholarship, students must satisfy the minimum GPA and credit hour requirements. Award amounts differ for two types of the scholarship: Florida Academic Scholars and Florida Medallion Scholars. Florida Academic Scholars recipients receive \$103 per semester credit at 4-year institutions, while Florida Medallion Scholars recipients receive \$77 per semester credit. High achieving high school students from each district collect a bonus award, Academic Top Scholars, with the amount of \$44 per semester credit at 4-year schools (Florida Department of Education, n.d.).

Bright Futures requires at least 6 credit-hour enrollment per semester and only covers 100 percent of the program hours, typically 120 credit hours. If a program of study requires more than 120 semester hours, students have an option to request the funding for additional credits. Students must reimburse their institution for any courses from which they withdraw. Unlike the Pell Grant, in which students may use remaining funds from fall and spring semesters towards summer courses, Bright Futures does not offer students summer funding. Another difference from the Pell Grant is that students lose their eligibility for the state merit-based program if not enrolled in postsecondary institutions within 5 years from high school graduation (Florida Department of Education, 2017).

GI Bill eligibility

A yes/no signifies student's qualification to receive GI Bill funding for college education. The Department of Veterans Affairs offers eligible veterans and their spouses, dependents, and survivors multiple educational benefits that vary in eligibility criteria, award amount, and duration of the benefits (U.S. Department of Veterans Affairs, 2012). What differentiates this financial aid from the other two discussed earlier is that students have a limited time—a maximum of 3 years—for the educational funding, instead of limited credit hours. If eligible for more than one educational benefit, the time limit extends to 4 years. Students must be enrolled in full-time to receive the maximum allowance.

College credits earned while in high school

High schools offer multiple opportunities for students to earn college credits while they are still enrolled in high school. Such opportunities include advanced placement, International Baccalaureate, and dual enrollment through local two-year colleges. The college credits high school students complete before college matriculation not only decrease the cost of college education but also demonstrate their academic abilities to admission officials at universities. Additionally, those credits earned in high school are exempt from the excess hour surcharge credit limit and serve as a buffer against the limit. As such, controlling for this covariate is critical in examining the association between the surcharge policy and college completion.

Academic major

Academic majors into which students were admitted by the university were examined to see if they have any association with student outcomes. Fifty-nine academic majors at the time of admission were grouped into 12 categories. Communication, criminal justice, psychology, and undecided majors are independent categories because of their large numbers, while the

remaining 55 majors are divided into eight categories: Art, Business, Education, Health, Language, Liberal Studies/Interdisciplinary Studies, Social Science, and STEM (Appendix C-1).

Data Analysis

This study employed a three-step analysis to examine how the excess hour surcharge policy affects student outcomes. First, the researcher compared descriptive statistics of students and their outcomes of pre-policy cohorts to those of post-policy cohorts. Second, the researcher used a linear probability model to estimate the impact of the policy on 4- and 5-year graduation rates. Lastly, using the data on student outcomes from the 14 admission cohorts, the researcher utilized a difference-in-difference approach to estimate differential impacts of the policy on the graduation rates, adding student's financial aid eligibility as a control variable.

The first analysis involved the comparison of descriptive statistics of students and their outcomes by the 14 admission cohorts. This first step is intended to paint a broad picture, detecting any changes in student demographics, attrition, graduation, and academic majors through the evaluation of statistical data from the admission cohorts before and after the implementation of excess hour surcharge policy in 2009.

The second analysis employed the following econometric model:

$$CollegeOutcome_{it} = \alpha + \beta_1 Surcharge_{it} + \beta_2 X_i + \varepsilon \quad (3-1)$$

$CollegeOutcome_{it}$ is the student outcome of interest for student i in time t . $Surcharge_{it}$ indicates whether or not student i in time t was subject to the excess hour surcharge policy; it is equal to 1 if the student is subject to the policy and is equal to 0 otherwise.

A list of covariates, X_i , was included to estimate any differential impacts of student characteristics on graduation rates. The list consists of Female (0 = male, 1 = female), Pell Grant, Bright Futures, and GI Bill eligibility (0 = not eligible, 1 = eligible), Race: African American, Asian/Pacific Islander, Hispanic, or Other (0 = no for the race, 1 = yes for the race),

College credits while in high school (0 = no credit, 1 = some credits), and Major: Art, Business, Communication, Criminal Justice, Education, Health, Interdisciplinary studies, Language, Psychology, Social Science, or STEM (0 = was not admitted into the major, 1 = admitted into the major). The other variable for the race was created to combine American Indians, multiple, non-resident alien, and unknown due to their small sizes. Students who are Caucasian or chose an undecided major at the time of admission, for example, would get all 0s in the race and academic major variables.

The intercept, α , estimates *CollegeOutcome* when student is Caucasian, admitted into undecided major, earned no college credits in high school, and is exempt from the policy; β_1 and β_2 are the regression coefficients that show the change in *CollegeOutcome* for each unit change in the variables – *Surcharge_{it}* and X_i . The error term, ε , denotes unobservable determinants of the student outcomes.

For the outcome variables – within 4-or 5-year graduation rates, the researcher used a linear probability model because the variables were binary; a student either graduated within 4 or 5 years or not. The coefficients in the model can be interpreted as the probability of change in *CollegeOutcome* for each unit increase in the dummy variables.

The final analysis took a difference-in-differences approach to examine the policy effect on student outcomes, incorporating student’s financial aid eligibility as a control variable. The approach is “an econometric tool that compares changes over time in treatment and control groups” (Angrist & Pischke, 2015, p. 245). As discussed earlier, the mandatory surcharge policy does not make randomized control trials feasible. The difference-in-differences method, introduced for policy analysis by Ashenfelter and Card (1985), allows researchers to overcome selection biases due to the lack of random assignments and mimic experiments. To adjust for

fixed differences between control and treatment groups, researchers contrast the changes in outcome variables by the two groups by subtracting the pre-treatment difference between the groups from the post-treatment difference (Angrist & Pischke, 2015).

The core assumption of the difference-in-differences method is a common trend: trends in student outcomes would be the same in both control and treatment groups in the absence of the surcharge policy, and a deviation from the common trend signals a treatment effect by the policy. The researcher investigated the trends and deviation by using data on student outcomes by the cohorts admitted before and after the introduction of the policy.

In this last analysis, students within the same admission cohorts between Summer 2005 and Fall 2011 were divided into two groups: eligible (i.e., treatment) or ineligible (i.e., control) for financial aid. The 14 admission cohorts provided the researcher with multiple data points and make regression difference-in-differences approach possible to produce statistical inference.

The researcher used the following regression model in the final analysis:

$$\begin{aligned}
 \text{CollegeOutcome}_{it} = & \alpha + \beta_1 \text{Surcharge}_{it} + \beta_2 \text{FinancialAid}_i \\
 & + \delta(\text{Surcharge}_{it} \times \text{FinancialAid}_i) + \beta_3 X_i + \varepsilon
 \end{aligned}
 \tag{3-2}$$

A dummy variable, *FinancialAid_i*, took on either the value of 0 for students who were ineligible for Pell Grant, Bright Futures, GI Bill, or any combination of the grant, scholarship, and GI Bill benefits or the value of 1 for students who were eligible for one or more of the three financial aid programs. *Surcharge_{it} x FinancialAid_i* is an interaction, reflecting how *CollegeOutcome* changes in a financial aid recipient group relative to a non-recipient group based on student's policy status (i.e., exempt versus subject). Another regression coefficient is β_3 , while δ is a difference-in-differences coefficient, capturing the treatment effect by the surcharge policy. Because some students qualify for more than one type of financial assistance,

a summary of the financial aid eligibility for the sample is available in Appendix (Tables B-1 and B-2).

Study Limitations

The methodology of this study has limitations that fall into two categories: data constraints and threats to external validity.

Data Constraints

The student data for this study consist of freshmen at one state university only. While all public universities are located in the same state, governed by the same board of governors, and under the same regulations, each institution possesses unique characteristics and serves different types of students. Additionally, the study utilizes data only on freshmen admitted to the university. Applicants accepted into state universities as freshmen are typically high-achieving students because high school GPA and SAT and ACT scores must be outstanding to receive admission offers. As a result, the sample for this study is not representative of all Florida state universities or all students attending public universities in Florida. The entire study sample included all freshman admits with different gender, ethnicity, and income level from a span of 10 years; however, the data from only 6 of the 10 years were used for this study due to its objective to examine 4- and 5-year graduation rates. The researcher added covariates to the analysis with the intention of reducing the heterogeneity of the sample.

Threats to External Validity

A concern for external validity exists in this study, possibly influencing study interpretation. The limited data for this study discussed above cause the difficulty of generalizing study results to other populations and settings. Because of the uniqueness of the university and freshman admits, the generalization of conclusions from this study are limited to freshman admits at the public universities that share similar traits as the university where this

study was conducted. The study replication at different institutions with diverse student sample will serve as a possible remedy for the threat (Dooley, 2001). However, the aim of this study was not generalizability but the examination of the association between the surcharge policy and student outcomes. Limiting this study sample to freshman admits at one state university enabled the researcher to create control and treatment groups as equivalently as possible and isolate the relationship between the independent and outcome variables from other influences.

CHAPTER 4 RESULTS

This chapter presents the findings from data analyses to answer the three research questions that guide this study. First, the researcher offers a summary of the descriptive statistics of the sample and their college outcomes. Second, the results for first two research questions present which variables have significant relationships with bachelor's degree graduation. Third, the difference-in-differences analyses for the third question estimated policy effects on college graduation by comparing financial aid recipients to non-recipients from pre- and post-policy introduction. The examination also included whether or not the surcharge policy affects the likelihood of college graduation differently based on the type of financial aid programs. Lastly, this chapter concludes with additional findings and a summary.

Descriptive Statistics

As discussed in Chapter 3, the sample for this study includes freshman matriculants ($n=19,760$) at a Florida public university between Summer 2005 and Fall 2015 semesters. An analytical sample ($n=13,681$) excluded those admitted for Summer 2012 semester and after because the recent admission cohorts enrolled at the university for less than 5 years at the time of data collection in December 2016. The exclusion resulted in nine pre-policy cohorts and five post-policy cohorts. Fall 2011 admitted students, the most recent admission cohort in the analytical sample, had spent 5 years at the university when the researcher collected data; therefore, this study focused on 4- and 5-year graduation rates for the completion outcome.

The analytical sample was divided into two groups (Tables 4-1 and 4-2). The control group (i.e., pre-policy) consists of the students who were exempt from the excess hour surcharge policy because of their admission terms being before the policy implementation in Fall 2009 semester. The treatment group (i.e., post-policy) contains those who were admitted to the

university between Fall 2009 and Fall 2011 semesters, thereby, subject to the policy. Tables 4-1 and 4-2 summarize the descriptive statistics of student outcomes and demographics used in the data analysis as covariates. Attrition denotes students who matriculated at the university but left without earning a bachelor’s degree. For example, attrition within 1 year includes students who stopped taking courses at the university after enrolling for 1 year or less.

Table 4-1. Summary of student outcomes

Variables	Pre-policy	Post-policy	Difference	
Observation (<i>n</i> =13,681)	9,143	4,538		
Graduation				
Within 4 years	0.198	0.247	0.048	***
5 years	0.423	0.475	0.052	***
Graduation by students admitted into STEM disciplines				
Within 4 years	0.159	0.203	0.044	*
5 years	0.377	0.414	0.037	
Attrition				
Within 1 year	0.181	0.150	-0.031	***
2 years	0.307	0.278	-0.029	***
3 years	0.378	0.349	-0.030	***
4 years	0.415	0.384	-0.032	***
5 years	0.436	0.403	-0.033	***

*** $p < 0.001$, ** $p < 0.005$, * $p < 0.01$

Compared to the pre-policy group, approximately 5 percent more students in the post-policy group completed undergraduate study within 4 or 5 years. The increase indicates an improvement in graduation rates after the policy introduction. Students admitted into STEM programs increased within 4- and 5-year graduation rates; however, the growth for within 4-year graduation is the only one with statistical significance. Additionally, attrition rates show that

fewer students (i.e., about 3 percent) in the post-policy group left the institution without a bachelor's degree than those in the pre-policy group. The decline suggests the improvement in student retention by the university; however, the university continued to lose more students during their freshman year than in any of the following years. Although the attrition is not part of the research questions in this study, students leaving the university affect graduation rates negatively. Therefore, the author examined the association between the surcharge policy and attrition outcome, incorporating some of the covariates. The results are included in the additional findings section at the end of this chapter.

Comparisons of student demographics between the pre-policy and post-policy groups reveal that a gender ratio has become more even in recent years. There are statistically significant declines of the enrollments by African American and Asian/Pacific Islander students, although the number of Caucasian students slightly increased in the treatment group. More Hispanic students were found in the post-policy group than the pre-policy group; however, the increase is insignificant. Approximately 10 percent more students qualified for Bright Futures, Pell Grant, or GI Bill in the post-policy group. Florida residents continued to be the majority (i.e., 96 percent) of freshman admits at the institution both before and after the policy implementation. The small increase (i.e., less than 1 percent) in the number of the state residents was found to be insignificant. About a quarter of freshman admits attained some college credits through accelerated mechanisms at a high school. The small increase in the post-policy group was not statistically significant, either.

Concerning academic majors, six major categories (i.e., Business, Communication, Criminal justice, Education, Other, and Undecided) experienced decreased interests from applicants in the post-policy group. The remaining six categories (i.e., Art, Health, Language,

Psychology, Social Science, and STEM) received a higher number of applications in the post-policy group. Among the categories in high demand, the STEM programs showed the most popularity as indicated by the highest increase (i.e., 6 percent) in applications. Lastly, it is interesting to see the decline by 4 percent in the number of students in post-policy group choosing an undecided major at the time of admission. The drop is the highest among the six academic major categories that experienced decreased numbers of applications in the post-policy group, followed by Business major categories (i.e., 3 percent). The decrease indicates that more students in recent admission cohorts knew or at least had some idea about what they want to study in college when they applied. The change is promising because the surcharge policy limits students' time in exploring majors once they enroll in postsecondary schools.

Table 4-2. Summary of student demographics

Variables	Pre-policy	Post-policy	Difference
Observation (N=13,681)	9,143	4,538	
Gender			
Male	0.426	0.462	0.036 ***
Female	0.574	0.538	-0.036 ***
Race			
African American	0.094	0.062	-0.032 ***
Asian/Pacific Islander	0.062	0.047	-0.015 ***
Caucasian	0.753	0.756	0.003
Hispanic	0.077	0.088	0.011

Table 4-2. Continued

Variables	Pre-policy	Post-policy	Difference
Financial aid eligibility			
Bright Futures– eligible	0.748	0.875	0.127 ***
Pell Grant – eligible	0.284	0.378	0.094 ***
GI Bill - eligible	0.009	0.019	0.010 ***
State residency			
Florida	0.953	0.960	0.006
non-Florida	0.047	0.040	-0.006
College credit earned while in high school			
No college credit	0.756	0.7446	-0.011
Some college credits	0.244	0.2554	0.011
Academic major at admission			
Art	0.046	0.056	0.010
Business	0.171	0.139	-0.032 ***
Communication	0.050	0.038	-0.012 **
Criminal Justice	0.027	0.026	-0.002
Education	0.068	0.058	-0.010
Health	0.128	0.139	0.012
Language	0.012	0.015	0.003
Psychology	0.057	0.066	0.010

Table 4-2. Continued

Variables	Pre-policy	Post-policy	Difference
Social Science	0.048	0.051	0.003
STEM	0.164	0.223	0.059 ***
Undecided	0.224	0.186	-0.038 ***
Other ^{^^}	0.007	0.005	-0.002

Note: ^Other includes Liberal Studies, Interdisciplinary, Non-degree seeking.

*** p < 0.001, ** p < 0.005, * p < 0.01

Effects of Excess Hour Surcharge Policy on College Completion

The primary objective of this study is to evaluate the effectiveness of the surcharge policy in achieving its intended goal, namely, improved efficiency in degree production at Florida public universities. The first data analysis involved an assessment of the relationship between the surcharge policy and within 4- and 5-year graduation. Covariates, such as students' gender, race, socioeconomic status using Pell Grant eligibility, Bright Futures and GI Bill eligibilities, Florida residency status, college credits completed in high school, and academic major at the time of admission, are part of the correlational model to estimate differential impacts of the student characteristics on the outcome.

A model used for the first analysis is as follows:

$$\begin{aligned}
 \text{CollegeOutcome}_{it} = & \alpha + \beta_1 \text{Surcharge}_{it} + \beta_2 \text{Female} + \beta_3 \text{African American} + \\
 & \beta_4 \text{Asian/Pacific Islander} + \beta_5 \text{Hispanic} + \beta_6 \text{Other} + \beta_7 \text{Pell Eligible} + \beta_8 \text{BrightFuturesEligible} + \\
 & \beta_9 \text{GIBillEligible} + \beta_{10} \text{FLresidency} + \beta_{11} \text{CollegeCredit} + \beta_{12} X_i + \varepsilon
 \end{aligned}
 \tag{4-1}$$

The X_i signifies a list of the academic major categories, excluding the undecided major that serves as a baseline.

Table 4-3 displays the results of linear probability model on the first research question, summarizing the relationship between the surcharge policy and within 4- and 5-year graduation.

Coefficients for variables by the model estimate average changes in the probability of the outcomes for each unit increase in variables. Results in the column (1) and (2) estimate the probability of within 4- and 5-year graduation by all students in the analytical sample. The table shows statistical significance for all coefficients in addition to robust standard errors in parentheses.

The positive coefficients for the surcharge policy variable indicate that the surcharge policy is positively associated with the likelihood of students graduating from the university within 4 or 5 years. For example, a coefficient of 0.0396 in the column (1) means that holding all of the student characteristics constant, students under the surcharge policy are 4 percentage points more likely to graduate within 4 years, compared to students exempt from the policy. A coefficient of the surcharge policy in the column (2) also reveals the positive relationship of the policy with the probability of within 5-year graduation although a slightly weaker one than the one for within 4-year graduation. Using the graduation rates by the pre-policy group in Table 4-1 as a baseline, the coefficients mean that 20 percent increase in 4-year graduation rate and 8 percent increase in 5-year graduation rate.

In terms of student characteristics and their effects on college completion, female students are approximately 10 percentage points more likely to graduate within 4 or 5 years than male students. With the exception of Asian/Pacific Islander students, the other three minority groups are less likely to complete a bachelor's degree within 4 or 5 years than Caucasian students.

Although Bright Futures recipients are over 10 percentage points more likely to attain undergraduate degrees within 4 or 5 years than non-recipients (i.e., 12 percentage points and 18 percentage points, respectively), Pell Grant beneficiaries are 2 percentage points less likely to

finish the degree within 4 years than non-beneficiaries. The analysis yielded a positive coefficient for within 5-year graduation by Pell Grant recipients; however, it is not statistically significant. Being eligible for GI Bill has a similar association with graduation as Pell Grant: a coefficient for within 4-year graduation is negative but insignificant, and a positive coefficient for within 5-year graduation in column (2) shows increased likelihood of accomplishing the collegiate goal by approximately 8 percentage points. Students with non-Florida residency are 13 percentage points more likely to graduate within 4 or 5 years, which is the second highest probability after students eligible for Bright Futures.

Table 4-3. Linear probability analyses on within 4-and 5-year graduation

VARIABLES	Within 4-year graduation (1)	Within 5-year graduation (2)
Surcharge policy	0.0396*** (0.00772)	0.0365*** (0.00914)
Female	0.0969*** (0.00728)	0.0933*** (0.00897)
Race		
African American	-0.0291** (0.0122)	-0.0490*** (0.0155)
Hispanic	-0.0358*** (0.0119)	-0.0861*** (0.0152)
Asian/Pacific Islander	0.0105 (0.0151)	0.0284 (0.0183)
Other	-0.0336 (0.0220)	-0.0461* (0.0279)
Financial aid eligibility		
Bright Futures	0.119*** (0.00752)	0.180*** (0.0106)
Pell Grant	-0.0156** (0.00759)	0.00698 (0.00930)
GI Bill	-0.00619 (0.0315)	0.0833** (0.0374)

Table 4-3. Continued

VARIABLES	Within 4-year graduation (1)	Within 5-year graduation (2)
State residency		
Non-Florida	0.130*** (0.0186)	0.130*** (0.0218)
Academic major at admission		
Art	0.0273 (0.0172)	0.0105 (0.0207)
Business	0.0186* (0.0109)	0.0298** (0.0138)
Communication	0.0564*** (0.0185)	0.0576*** (0.0216)
Criminal Justice	0.0482** (0.0225)	0.00360 (0.0270)
Education	0.0644*** (0.0167)	0.0337* (0.0189)
Health	0.00736 (0.0124)	-0.0281* (0.0149)
Language	0.0664** (0.0332)	-0.0283 (0.0368)
Psychology	0.0627*** (0.0168)	0.0418** (0.0195)
Social Science	0.0795*** (0.0181)	0.0346* (0.0208)
STEM	-0.00243 (0.0105)	-0.0351*** (0.0134)
Interdisciplinary studies	-0.0488 (0.0382)	-0.0384 (0.0545)
College credit earned while in high school		
Some college credits	0.0853*** (0.00876)	0.0539*** (0.00990)
Observations	13,681	13,681
R-squared	0.052	0.044

Robust standard errors in parentheses

Race-Other includes Native American, multiple, not reported, and non-resident alien

*** p<0.01, ** p<0.05, * p<0.1

Regarding academic majors at the time of admission, students admitted into STEM or Health categories have decreased chance (i.e., 3 percentage points) of graduating within 5 years when compared to undecided major admits. On the other hand, students who chose Business, Communication, Criminal Justice, Education, Language, Psychology, and Social Science major categories enjoy increased likelihood of within 4 or 5-year graduation or both.

Effects of Excess Hour Surcharge Policy on College Completion by STEM Admits

Because of the critical need for STEM degree holders in U.S. workforce, the second research question examined the effects of the surcharge policy further to assess if the impacts differ from STEM admits to non-STEM admits. In this analysis, two variables, *Policy*STEM* and *Admit STEM* replaced the X_i in the Equation 4-1.

$$CollegeOutcome_{it} = \alpha + \beta_1 Surcharge_{it} + \beta_2 Female + \beta_3 African\ American + \beta_4 Asian/Pacific\ Islander + \beta_5 Hispanic + \beta_6 Other + \beta_7 Pell\ Eligible + \beta_8 BrightFuturesEligible + \beta_9 GIBillEligible + \beta_{10} FLresidency + \beta_{11} Policy*STEM + \beta_{12} Admit\ STEM + \varepsilon \quad (4-2)$$

The examination did not yield a statistical significance for the *Policy*STEM* variable, meaning that the positive correlation between the surcharge policy and college graduation remains the same whether or not students are STEM admits.

Table 4-4. Linear probability model analyses on the interaction effects of the surcharge policy and STEM program admission on within 4-and 5-year graduation

VARIABLES	Within 4-year graduation (1)	Within 5-year graduation (2)
Surcharge policy	0.0413*** (0.00875)	0.0384*** (0.0102)
Academic major at admission		
STEM	-0.0265** (0.0106)	-0.0422*** (0.0138)
Policy x STEM	-0.00200 (0.0177)	-0.0135 (0.0220)

Table 4-4. Continued

VARIABLES	Within 4-year graduation (1)	Within 5-year graduation (2)
Female	0.101*** (0.00699)	0.0913*** (0.00865)
Race		
African American	-0.0291** (0.0122)	-0.0509*** (0.0154)
Hispanic	-0.0351*** (0.0119)	-0.0864*** (0.0152)
Asian/Pacific Islander	0.00423 (0.0150)	0.0214 (0.0183)
Other	-0.0349 (0.0221)	-0.0459 (0.0280)
Financial aid eligibility		
Bright Futures	0.117*** (0.00749)	0.177*** (0.0106)
Pell Grant	-0.0148* (0.00761)	0.00732 (0.00930)
GI Bill	-0.00809 (0.0317)	0.0816** (0.0372)
State residency		
Non-Florida	0.129*** (0.0185)	0.130*** (0.0218)
College credit earned while in high school		
Some college credits	0.0847*** (0.00877)	0.0525*** (0.00990)
Observations	13,681	13,681
R-squared	0.048	0.042

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Effects of Excess Hour Surcharge Policy Based on Financial Aid Eligibility

The analyses of the first two research questions found the surcharge policy to have positive correlations with 4- and 5-year graduation. The last research question examined if the relationship between the surcharge policy and college completion is different from financial aid recipients to non-recipients. A model for the last question, therefore, includes a new variable,

$\beta_2(\text{Surcharge} * \text{FinancialAid})$ and utilizes a difference-in-differences approach in estimating the impact on the outcome.

$$\text{CollegeOutcome}_{it} = \alpha + \beta_0 \text{Surcharge}_{it} + \beta_1 \text{FinancialAid Eligibility} + \delta(\text{Surcharge} * \text{FinancialAid}) + \varepsilon \quad (4-3)$$

The FinancialAid variable takes four forms – any financial aid, Bright Futures only, Pell Grant only, and GI Bill only.

The difference-in-differences statistical method assesses policy effects by comparing the differences in student outcomes between control and treatment groups at pre- and post-policy introduction. If within 4- or 5-year graduation rates for the two groups move in parallel lines before the adoption of the policy, and changes occur in the trend after the implementation, the departure from the trend may signify a treatment effect on the outcome variable (Angrist & Pischke, 2015). The methodology generates a difference-in-differences coefficient, δ , to estimate the treatment effect.

To address the possibility of factors other than the surcharge policy causing a deviation, the researcher reviewed the Florida State University Board of Governors website in addition to online catalogs at the university website and found no major policies or initiatives implemented within a few years of the policy adoption. The university started limiting undergraduate students to six course withdrawals effective Fall 2013 semester, which is 4 years after the enactment of the policy. Any withdrawals prior to the effective semester do not count towards the limit. The most recent admission cohort (i.e., Fall 2011) in the analytical sample had already spent two years in postsecondary education. Although students in the cohort faced the withdrawal limitations during their junior and senior years, the limitation should not make the impact on their graduation because of the fact that they had all of the six withdrawal opportunities available to them in the last two years of college.

Table 4-5 replaces Bright Futures, Pell Grant, and GI Bill variables in Table 4-3 with two new variables, Any Financial Aid and an interaction of Policy and Financial aid while keeping other covariates reported in Table 4-3 in the analysis. Positive coefficients for the Any Financial Aid variable indicate that in general, receiving any type of financial assistance increases students' probability of within 4- or 5-year graduation by 11 percentage points and 18 percentage points, respectively.

On the other hand, the Policy x Any Financial Aid variable resulted in negative coefficients with no statistical significance for both within 4- and 5-year graduation. The finding means that the association between the surcharge policy and college completion does not vary based on students' financial aid eligibility. To assess the interaction effect further, the researcher next inspected the association of the policy with each type of the three financial aid programs (Table 4-6).

Table 4-5. Linear probability model analyses on the interaction effects of the surcharge policy and financial aid eligibility on within 4-and 5-year graduation

VARIABLES	Within 4-year graduation (1)	Within 5-year graduation (2)
Surcharge policy	0.0443** (0.0204)	0.0533** (0.0266)
Financial aid eligibility		
Any financial aid	0.112*** (0.00885)	0.186*** (0.0128)
Policy x Financial aid	-0.00369 (0.0218)	-0.0133 (0.0282)
Female	0.0980*** (0.00728)	0.0948*** (0.00897)
Race		
African American	-0.0556*** (0.0118)	-0.0771*** (0.0150)
Hispanic	-0.0436*** (0.0119)	-0.0915*** (0.0152)

Table 4-5. Continued

VARIABLES	Within 4-year graduation (1)	Within 5-year graduation (2)
Asian/Pacific Islander	0.00508 (0.0150)	0.0250 (0.0182)
Other	-0.0338 (0.0222)	-0.0443 (0.0282)
State residency		
Non-Florida	0.110*** (0.0184)	0.109*** (0.0216)
Academic major at admission		
Art	0.0280 (0.0172)	0.0108 (0.0207)
Business	0.0194* (0.0110)	0.0306** (0.0139)
Communication	0.0546*** (0.0185)	0.0538** (0.0216)
Criminal Justice	0.0469** (0.0225)	0.00193 (0.0270)
Education	0.0630*** (0.0167)	0.0322* (0.0190)
Health	0.00878 (0.0124)	-0.0265* (0.0149)
Language	0.0654* (0.0334)	-0.0303 (0.0373)
Psychology	0.0581*** (0.0169)	0.0361* (0.0195)
Social Science	0.0793*** (0.0181)	0.0345* (0.0209)
STEM	-0.00138 (0.0105)	-0.0331** (0.0134)
Interdisciplinary studies	-0.0504 (0.0378)	-0.0413 (0.0536)
College credit earned while in high school		
Some college credits	0.0892*** (0.00875)	0.0590*** (0.00989)
Observations	13,681	13,681
R-squared	0.048	0.041

Race-Other includes Native American, multiple, not reported, and non-resident alien

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Consistent with the results reported in Table 4-3, students eligible for Bright Futures are more likely to graduate within 4 or 5 years, whereas Pell Grant and GI Bill recipients have either less probability for the graduation or the eligibility has no statistically significant association with the college outcome.

The coefficients for Policy x Bright Futures and Policy x Pell Grant variables are not statistically significant, indicating that the correlation of the policy with college completion does not differ based on students' eligibility for the two financial aid programs. In contrast, the association between the policy and within 4-year graduation is different from GI bill beneficiaries to non-beneficiaries.

Table 4-6. Linear probability model analyses on the interaction effects of the surcharge policy and specific types of financial aid eligibility on within 4-and 5-year graduation

VARIABLES	Within 4-year graduation (1)	Within 5-year graduation (2)
Surcharge policy	0.0486*** (0.0173)	0.0477** (0.0226)
Financial aid eligibility		
Bright Futures	0.123*** (0.00828)	0.181*** (0.0118)
Pell Grant	-0.0181** (0.00920)	0.0149 (0.0116)
GI Bill	-0.108*** (0.0322)	0.0262 (0.0539)
Policy x Bright Futures	-0.0169 (0.0185)	-0.00656 (0.0239)
Policy x Pell Grant	0.00802 (0.0156)	-0.0208 (0.0188)
Policy x GI Bill	0.196*** (0.0599)	0.109 (0.0744)
Female	0.0970*** (0.00728)	0.0931*** (0.00897)

Table 4-6. Continued

VARIABLES	Within 4-year graduation (1)	Within 5-year graduation (2)
Race		
African American	-0.0285** (0.0122)	-0.0498*** (0.0155)
Hispanic	-0.0360*** (0.0119)	-0.0862*** (0.0152)
Asian/Pacific Islander	0.0110 (0.0151)	0.0284 (0.0183)
Other	-0.0347 (0.0221)	-0.0463* (0.0279)
State residency		
Non-Florida	0.128*** (0.0185)	0.130*** (0.0219)
Academic major at admission		
Art	0.0265 (0.0172)	0.0102 (0.0207)
Business	0.0187* (0.0109)	0.0299** (0.0138)
Communication	0.0560*** (0.0185)	0.0573*** (0.0216)
Criminal Justice	0.0483** (0.0225)	0.00366 (0.0269)
Education	0.0643*** (0.0166)	0.0338* (0.0189)
Health	0.00677 (0.0124)	-0.0283* (0.0149)
Language	0.0654** (0.0331)	-0.0285 (0.0368)
Psychology	0.0621*** (0.0168)	0.0415** (0.0195)
Social Science	0.0786*** (0.0181)	0.0344* (0.0208)
STEM	-0.00278 (0.0105)	-0.0352*** (0.0134)
Interdisciplinary studies	-0.0482 (0.0382)	-0.0374 (0.0544)

Table 4-6. Continued

VARIABLES	Within 4-year graduation (1)	Within 5-year graduation (2)
College credit earned while in high school		
Some college credits	0.0849*** (0.00876)	0.0539*** (0.00991)
Observations	13,681	13,681
R-squared	0.053	0.044

Robust standard errors in parentheses

Race-Other includes Native American, multiple, not reported, and non-resident alien

*** p<0.01, ** p<0.05, * p<0.1

Figures 4-1 through 4-3 also illustrate no differential effect of the policy on college completion based on students' financial aid eligibilities - any financial aid, Bright Futures, and Pell Grant. The parallel trends during the pre-policy period continue even after the policy introduction in Fall 2009. The figures also display the ascending trends in within 4- and 5-year graduation for both financial aid recipients and non-recipients. It appears that the surcharge policy has similar positive correlations with bachelor's degree graduation among students with and without financial assistance.

Additional Findings

The results of the first research question revealed that non-Florida residency status has the second highest likelihood of within 4- and 5-year graduation, following Bright Futures eligibility. One may find it understandable because students in out-of-state residency status are not entitled to the subsidized tuition rate available to Florida state residents. In FY 2017-2018, an undergraduate tuition rate for non-Florida residents at the institution where this study was conducted is more than triple the rate for Florida residents. The other state universities share with the institution the same tuition practice for non-residents. Regardless of the markedly higher college cost, there is no exemption clause for out-of-state student in the excess hour surcharge policy legislation. As such, the university where the study was conducted applies out-

of-state students with surcharge when they exceed the credit limits established by the statute. Additionally, two of the 12 state universities clearly state on their websites that out-of-state students who matriculate at a Florida public university as a freshman are subject to the surcharge policy and pay the same surcharge rate as Florida residents (University of South Florida, 2017; University of West Florida, 2017).

As explained in Chapter 3, 50 percent and 100 percent surcharge rates are calculated based on a tuition portion only, excluding fees. For example, state residents with the 100 percent surcharge pay \$105.07 more per credit once maximum allowable credits are exceeded, which amounts to \$318.20 per credit. Out-of-state students with the same surcharge rate would pay \$798.33 per credit when they enroll in credits past the credit limits. The surcharge increase an annual tuition costs for full-time enrollment (i.e., 30 semester credits) by over \$3,000 for both Florida residents and out-of-state students.

Table 4-7. Differences in tuition and fees based on Florida state residency status

Per credit hour	Florida resident	Non-Florida resident
Undergraduate tuition	\$105.07	\$562.34
Fees	\$108.06	\$130.92
Total per credit	\$213.13	\$693.26
Total per credit with 100% surcharge	\$318.20	\$798.33
Annual tuition for full-time enrollment (30 credits) including the surcharge	\$9,546.00	\$23,949.90

The researcher added another analysis to examine the relationship between the surcharge policy and out-of-state residency status. The additional examination replaced the Financial Aid and Policy x Financial Aid interaction variables in the Equation 4-3 with Out-of-State Residency variables, β_1 Out-of-State Residency and β_2 (Surcharge*Out-of-State Residency) to determine if the correlation between the surcharge policy and college graduation change based on students' non-Florida residency status.

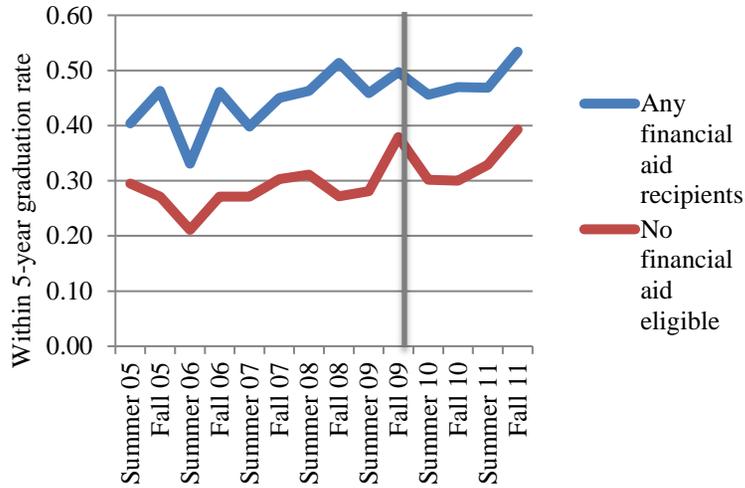


Figure 4-1. Within 5-year graduation rate per admission cohort by any Financial Aid eligibility

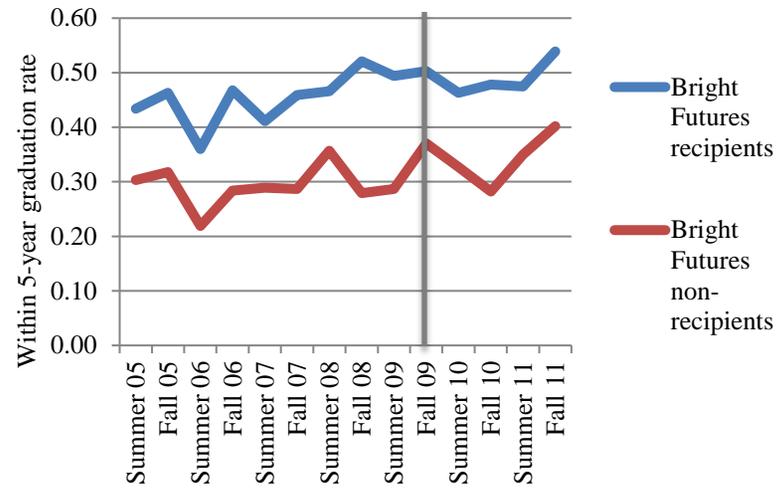


Figure 4-2. Within 5-year graduation rate per admission cohort by Bright Futures eligibility

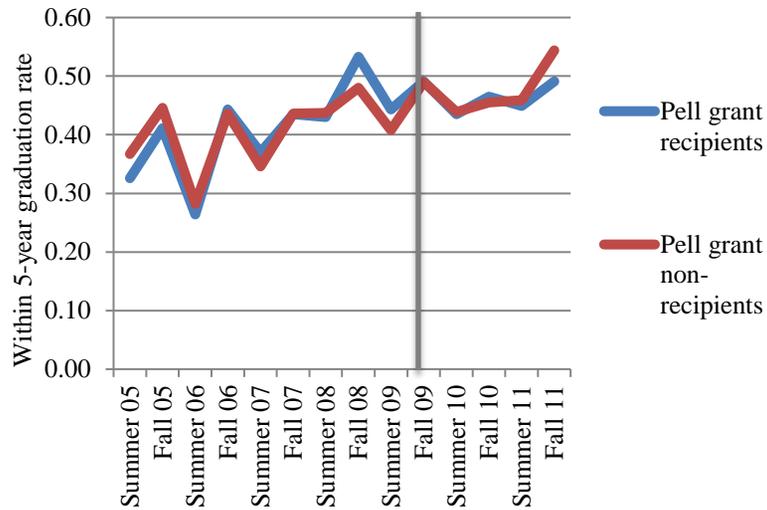


Figure 4-3. Within 5-year graduation rate per admission cohort by Pell Grant eligibility

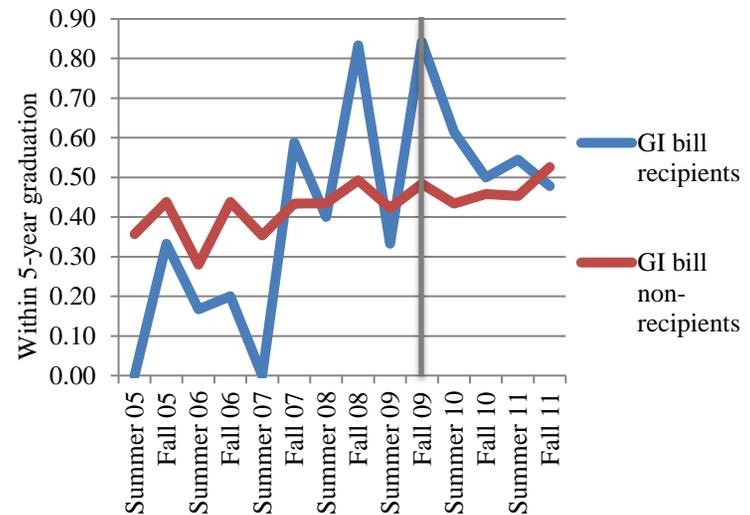


Figure 4-4. Within 5-year graduation rate per admission cohort by GI Bill eligibility

$$CollegeOutcome_{it} = \alpha + \beta_0 Surcharge_{it} + \beta_1 Out-of-State Residency + \beta_2 (Surcharge * Out-of-State Residency) + \beta_3 X_i + \varepsilon \quad (4-4)$$

Consistent with earlier findings, Table 4-8 reflects 10 to 11 percentage points higher likelihood of non-Florida residents to complete bachelor’s degrees within 4- and 5-years, compared to Florida residents. When comparing to the pre-policy graduation rates in Table 4-1, the increases denote 55 percent increase in 4-year graduation rate and 24 percent increase in 5-year graduation rate.

Unlike the relationship between the surcharge policy and financial aid eligibility, the relationship between the policy and out-of-state residency status was found to be different for both 4- and 5-year graduation, meaning that the surcharge policy has a bigger effect on college completion for non-Florida residents than Florida residents.

Table 4-8. Linear probability analyses on the interaction effects of the surcharge policy and out of state residency status on within 4-and 5-year graduation

VARIABLES	Within 4-year graduation (1)	Within 5-year graduation (2)
Surcharge policy	0.0368*** (0.00785)	0.0322*** (0.00932)
State residency		
Non-Florida	0.110*** (0.0210)	0.100*** (0.0249)
Policy x non-FL residency	0.0668* (0.0406)	0.103** (0.0450)
Female	0.0968*** (0.00728)	0.0931*** (0.00897)
Race		
African American	-0.0291** (0.0122)	-0.0490*** (0.0154)
Hispanic	-0.0357*** (0.0119)	-0.0859*** (0.0152)

Table 4-8. Continued

VARIABLES	Within 4-year graduation (1)	Within 5-year graduation (2)
Asian/Pacific Islander	0.0109 (0.0151)	0.0290 (0.0184)
Other	-0.0357 (0.0220)	-0.0493* (0.0279)
Financial aid eligibility		
Bright Futures	0.120*** (0.00752)	0.181*** (0.0106)
Pell Grant	-0.0156** (0.00759)	0.00690 (0.00930)
GI Bill	-0.00829 (0.0313)	0.0800** (0.0375)
Academic major at admission		
Art	0.0273 (0.0172)	0.0104 (0.0207)
Business	0.0186* (0.0109)	0.0297** (0.0138)
Communication	0.0564*** (0.0185)	0.0576*** (0.0216)
Criminal Justice	0.0481** (0.0225)	0.00347 (0.0270)
Education	0.0643*** (0.0166)	0.0335* (0.0189)
Health	0.00732 (0.0124)	-0.0281* (0.0149)
Language	0.0667** (0.0332)	-0.0279 (0.0368)
Psychology	0.0631*** (0.0168)	0.0425** (0.0195)
Social Science	0.0794*** (0.0181)	0.0345* (0.0208)
STEM	-0.00238 (0.0105)	-0.0350*** (0.0134)
Interdisciplinary studies	-0.0493 (0.0382)	-0.0391 (0.0544)
College credit earned while in high school		
Some college credits	0.0853*** (0.00876)	0.0540*** (0.00990)

Table 4-8. Continued

VARIABLES	Within 4-year graduation (1)	Within 5-year graduation (2)
Observations	13,681	13,681
R-squared	0.052	0.045

Robust standard errors in parentheses

Race-Other includes Native American, multiple, not reported, and non-resident alien

*** p<0.01, ** p<0.05, * p<0.1

The attrition rates in Table 4-1 at the beginning of this chapter revealed that more students in both pre- and post-policy groups left the university during their first year than subsequent years. Additional analysis on attrition indicates that being subject to the surcharge policy, qualifying for any type of financial aid programs, or earning some college credits while enrolled in high school are correlated with a decreased likelihood of students leaving the university within 1 year (8 percent, 56 percent, and 16 percent decrease compared to the pre-policy attrition rate, respectively). On the other hand, neither non-Florida residency nor STEM major admission status has a statistically significant relationship with the 1-year attrition rate.

The analyses yielded coefficients with statistical significance for two interaction terms: between the surcharge policy and financial aid eligibility and between the surcharge policy and college credits. The findings signify the associations of the surcharge policy with 1-year attrition differ from financial aid recipients to non-recipients and from students with some college credits earned in high school to students with no college credit earned in high school.

Table 4-9. Linear probability model analyses on 1-year attrition with covariates

VARIABLES	(1)	(2)	(3)	(4)	(5)
Surcharge policy	-0.0146**	-0.0224***	-0.0150**	-0.0122	-0.0262***
	(0.00676)	(0.00674)	(0.00685)	(0.00753)	(0.00784)
Any financial aid		-0.101***			
		(0.0122)			
Policy x Any financial aid		-0.0547**			
		(0.0273)			
Non-Florida residency			0.00538		
			(0.0222)		
Policy x non-Florida residency			0.0101		
			(0.0381)		
STEM major at admission				0.00741	
				(0.0109)	
Policy x STEM				-0.0104	
				(0.0163)	
College credit earned in high school					-0.0291***
					(0.00894)
Policy x College credit					0.0456***
					(0.0150)

Note: The five models included all variables in analyses. See Appendix E for a complete table.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

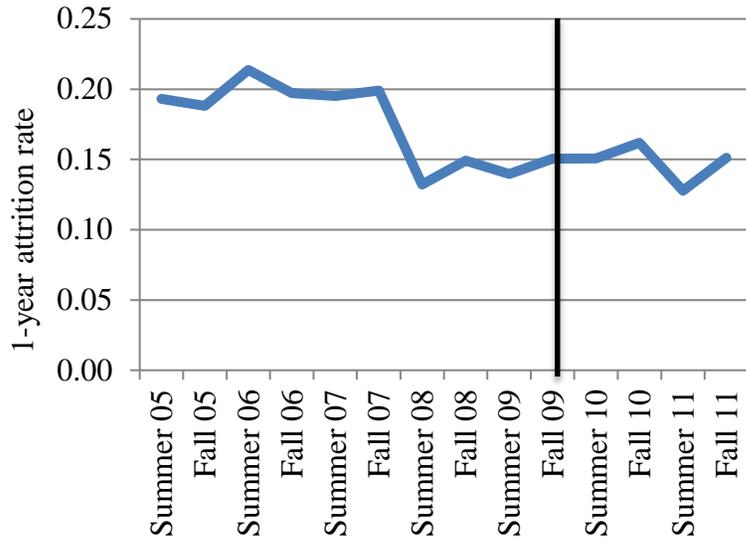


Figure 4-5. 1-year attrition rates by admission cohorts

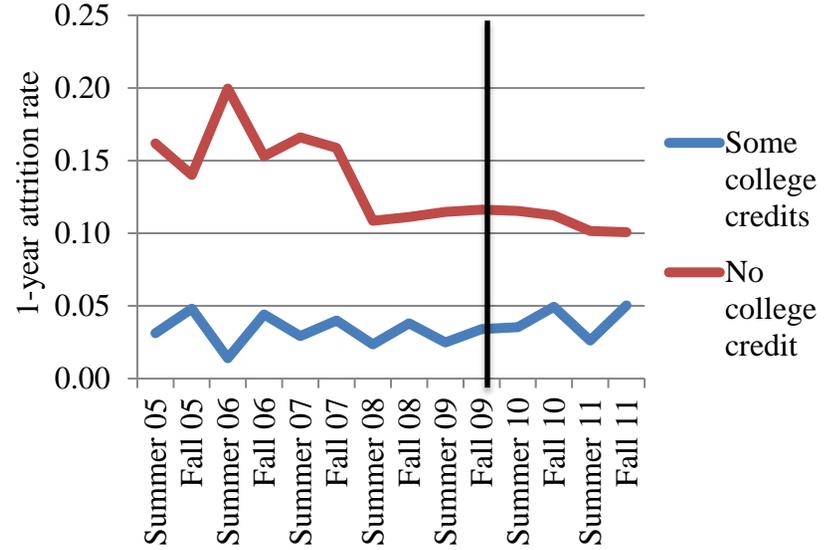


Figure 4-6. 1-year attrition rates per admission cohort by college credits earned in high school

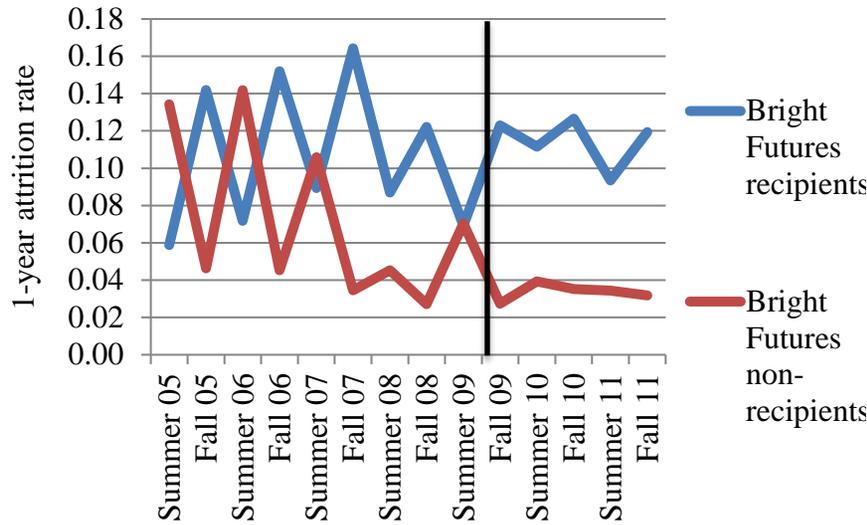


Figure 4-7. 1-year attrition rates per admission cohort by Bright Futures eligibility

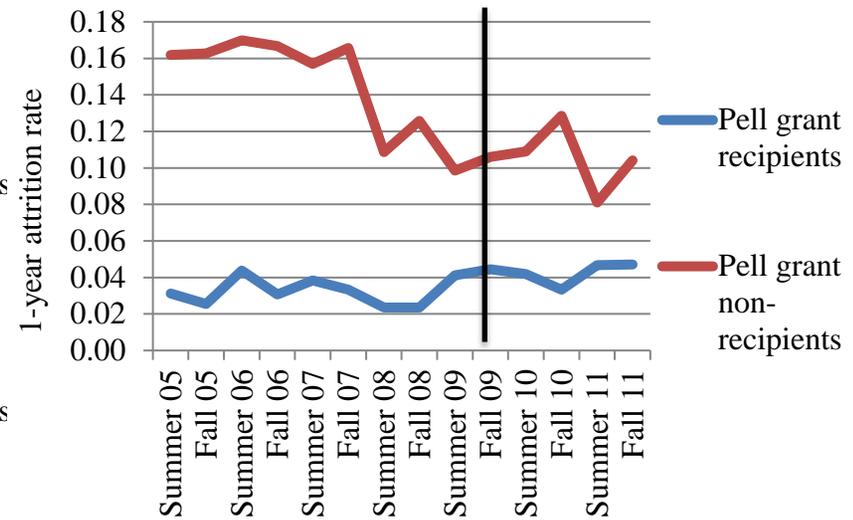


Figure 4-8. 1-year attrition rates per admission cohort by Pell Grant eligibility

Summary

Colleges and universities are facing increased accountability from policymakers and the public to improve the efficiency in degree production. This study evaluated one approach of using credit limits and surcharges to incentivize students for timely graduation. The analyses showed that the excess hour surcharge policy, implemented at Florida state universities in Fall 2009 semester, to have a positive correlation with the probability of timely completion of bachelor's degrees. The surcharge policy does not affect college completion differently based on STEM admit status. Additionally, this study identified some student characteristics with increased and decreased likelihoods of college graduation.

Difference-in-differences analyses revealed that, in general, the correlations between the surcharge policy and college completion does not differ based on students' financial aid eligibility. Two student characteristics yielded statistical significance in affecting the relationship between the policy and college graduation: one is GI Bill eligibility for within 4-year graduation and the other is non-Florida resident status for within 5-year graduation.

Students face many internal and external factors in making decisions on college education. The findings of this study present empirical evidence to help policymakers and higher education leaders gain insights into financial incentives to successfully lead students to college graduation. Chapter 5 discusses emerging themes from the results and offer policy implications for higher education practitioners.

CHAPTER 5 DISCUSSION AND CONCLUSION

This final chapter summarizes main findings for the three research questions. The author discusses implications of the findings for higher education practice and literature. The chapter concludes with major limitations of this study and future research opportunities.

Major Findings for Research Questions

The purpose of this study was to evaluate the effectiveness of the excess hour surcharge policy in achieving its intended objective, the increase in timely degree production at state universities. To that end, the study posed the following three research questions:

Research question 1: Does the excess hour surcharge policy affect college completion?

Research question 2: Does the excess hour surcharge policy influence college completion of students admitted into STEM majors?

Research question 3: Does the association between the excess hour surcharge policy and college completion vary for students eligible for financial aid programs?

The first research question asked if the surcharge policy has an impact on students' college degree completion. The analyses used a linear probability model to provide the evidence that the surcharge policy is positively correlated with within 4- and 5-year graduation. Students subject to the policy are 3 to 4 percentage points more likely to graduate from the university with bachelor's degrees within 4 or 5 years.

The second research question shifted the focus towards college degree attainments by students who admitted under STEM programs. An examination shows that the particular group of students is less likely to graduate within 4 and 5 years compared to students admitted into non-STEM; however, the association between the surcharge policy and college completion does not differ from STEM program admits to non-STEM program admits.

The third research question employed a difference-in-difference method to estimate the policy effects on college completion using financial aid recipients as a treatment group and non-recipients as a control group. This study found the eligibility for any financial aid program to have a significant and positive correlation with 4- and 5-year graduation on its own; however, the study did not find the surcharge policy to differentially affect college completion for students who qualify for financial assistance. The researcher also included another interaction variable between the policy and out-of-state residency status when the findings for research question one indicated that students' non-Florida state residency status increases the likelihood of college completion by over 10 percentage points. The additional examination suggests that the surcharge policy has a differential effect on college completion rates of out-of-state students.

Although attrition rate was not one of the outcome variables for this study, the author examined the additional variable as students leaving the university affect 4- and 5-year graduation rates, which in turn could affect the findings of this study. Figure 4-5 shows that 1-year attrition rate declined from 20 to 15 percent with summer 2008 admission cohort before the surcharge policy adoption. It remained about 15 percent for fall 2008 through fall 2011 cohorts. Just as the graduation outcome, financial aid eligibility has different effects on attrition, depending on types of financial assistance. Bright Futures recipients have a higher attrition rate than non-recipients. Pell grant recipients have a lower attrition rate than non-recipients. Students who earned some college credits through high school also are less likely to leave the university than those without any college credit upon matriculation.

Three reasons causing students to leave a university are transferring to another institution, dropping out of college for a variety of reasons, and being suspended due to poor academic performance. Losing the first type of students may have weakened the results of this study

because had they stayed at the university and graduated within 5 years, the correlation between the surcharge policy and college completion could have been stronger. In contrast, if the second and third types of students continued to enroll at the university, the factors that caused them to leave the university could negatively affect their progress towards graduation. Thus, retaining these students may not change the study results as much. Further analysis on the effect of attrition was not possible due to the limited data available to this study.

Implications and Recommendations for Higher Education Practice

The findings from this study provide support for two primary themes that would shape higher education practice in regard to student retention and graduation. This section reviews each theme in details and offers policy implications based on suggestive evidence. The first theme focuses on the role of financial incentives for students to graduate in an efficient manner. The second theme addresses the differential effect of financial aid programs on students' college outcomes. It is important to point out that the findings of this study are correlational, not causal. It is possible that college completion increased in the post-policy group besides the introduction of the surcharge policy. As a result, the themes and policy implications discussed in the next section are based on suggestive evidence.

The Role of Financial Incentives on College Completion

Increased demands for accountability on colleges and universities initiated various nationwide efforts to increase college graduation rates. Given the prospects of employment opportunities and earning potentials college degrees provide for individuals, the success of such efforts is critical not only for students but also for each state and the nation as a whole. Many states and institutions adopted financial policies such as performance-based funding, merit-based scholarship, and tuition incentives to improve the efficiency of post-secondary schools, which in turn should result in an increase in college completion. While a performance-based funding

model implemented at an institution level received unconvincing empirical findings (Hillman, Tandberg, & Gross, 2014; Rutherford & Rabovsky, 2014), financial policies directed at students prove to be more promising.

A recent study examining the impact of a one-year performance-based scholarship on students' academic progress shows the promising results that the financial incentive motivated Ohio students to complete more credit hours and graduate faster (Mayer, Patel, & Gutierrez, 2016). A free tuition program called PROMISE scholarship in West Virginia requires a minimum credit completion and GPA for renewal. The PROMISE scholarship program also produces statistically significant impacts on students' time-to-degree (Scott-Clayton, 2011). The in-depth analysis of PROMISE indicates that the success of the West Virginia program lies in the minimum course load requirement.

The findings from the current study on the excess hour surcharge policy add to existing literature empirical evidence that financial incentives, not only scholarship rewards but also penalty by a surcharge, positively direct students towards graduation. The surcharge policy was found to be positively associated with increased likelihoods of college completion. Moreover, the positive correlation exists for both financial aid recipients and non-recipients, as this study did not find the policy to affect college completion differently based on students' eligibility for financial assistance. Not only students who may not have a financial mean to pay for the surcharge but also those with financial assistance are positively affected by the surcharge policy.

Human capital theory can explain the change in students' behaviors: the multiple notifications of the policy from the university and discussion about it with academic advisors promote students' cost-benefit evaluation of their college education. The discussion ensures enhanced understanding of complicated college costs and funding and helps students assess the

costs and benefits accurately and rationally. According to the study results, students seek to minimize the cost of obtaining a bachelor's degree and adjust their educational plans accordingly. It appears that the cost-benefit evaluation superseded psychological factors, such as passion and desire, among the students in this study sample. Unlike the parents at a daycare center in Gneezy & Rustichini's study discussed in Chapter 2, students do not appear to consider the surcharge as something that gives them a privilege of extending their college study. Instead, this study concurs with the survey results at European institutions (Brunello & Winter-Ebmer, 2003), also discussed in Chapter 2, that the less financially responsible students are for their college education, the more time they spend on degree completion.

Policy implications

Increasing college costs and diminishing financial assistance for students must play some role in the success of financial incentives. For such enticements to be most effective, they should be offered to students with clear expectations as early as students' first semester in college, similar to the excess hour surcharge policy. The author believes the success of the surcharge policy was due to the collaborative efforts of the university. Departments and administrative offices within a postsecondary institution often work in silos (Figueiro & Raufflet, 2015; Hoover & Harder, 2013). However, the surcharge policy necessitated academic and financial departments to work together, as students' academic decisions have the financial consequences that could decrease state funding for the institution in addition to increasing college costs on students.

When colleges and universities develop institutional scholarships or grants, they should not only require students to complete a minimum number of credits or maintain a certain GPA but also include the progress towards degree completion as a renewal requirement. The

additional requirement will urge academic advisors to discuss the financial ramifications of students' academic decisions, which may help students make informed academic decisions. Furthermore, the requirement would keep students mindful of staying on track for graduation and require them to commit to an academic major in the first or second semester in college.

The Differential Effects of Financial Aid Programs on College Completion

Although this study revealed that students' financial aid eligibility does not affect the relationship between the surcharge policy and college completion, the findings also showed that financial assistance generally makes a statistically significant impact on college completion on their own, and the impact differs depending on the type of the assistance. The current study found the surcharge policy to have a positive correlation with degree production; however, policymakers and higher education leaders must also keep in mind that other factors can interfere with the incentive and generate results with varying degrees of success.

As discussed in the previous chapter, Pell Grant recipients in the analytical sample have a decreased probability of degree completion compared to non-recipients, or the receipt of the funding does not affect the chance of graduation significantly. On the other hand, Bright Futures recipients are 12 percentage points more likely to graduate within 4 years and 18 percentage points more likely in 5 years than non-recipients. The contrasting impact of the merit-based and need-based financial aid programs may be a result of their eligibility requirements. Bright Futures not only requires students to attain high academic achievements in high school but also has a credit restriction (i.e., up to 100 percent of the program hours) and minimum 3.0 GPA and credit completion requirements for renewal. Pell Grant mainly relies on students' financial needs and enrolled credits for eligibility consideration and has more relaxed requirements for renewal (i.e., successfully completing two-thirds of attempted credits in the previous semester and coverage up to 150 percent of total program hours).

The findings show higher education leaders that financial assistance does not produce uniform effects on student outcomes, and also that some students require more than monetary assistance to graduate from universities as promptly as expected. This knowledge could help administrators and practitioners develop institutional scholarship or grant programs that use a comprehensive approach to support students towards graduation and target an appropriate group of students for financial planning and retention programming.

Policy implications

Merit-based and need-based financial aid programs serve different types of students. Given the diverse student population postsecondary institutions serve, it is critical that financial aid programs use different eligibility requirements so that funding is distributed to a variety of students as opposed to a limited group of students with common characteristics. The current study shows that with proper incentives, students eligible or ineligible for financial assistance can improve their academic performance for timely graduation. Knowing which type of students are more likely to spend more time to complete a bachelor's degree and also which type of financial aid programs are more effective in degree production will enable higher education leaders to direct their retention and graduation efforts. Additionally, due to the fact that bachelor's degree graduation rate is part of the Florida Board of Governors' performance-based funding metrics, it is strategic for state universities to pay particular attention to the academic progress of the group of at-risk students and intervene as early and necessary. A comprehensive approach may include financial planning sessions, mentoring, on-campus employment opportunities, and academic major selection workshops, all of which are particularly beneficial to the group of students with decreased likelihoods of graduating within 5 years.

Major Limitations of the Study

It is important to note the limitations of this study before discussing future research opportunities for the topic of excess hour surcharge policy. The major limitation of this study lies in the exclusion of transfer students from Florida state colleges. Although upper-level transfer students consist of almost a half of undergraduate students at the institution where this study was conducted, the author chose to exclude the student population from the sample for the internal validity concern. To accurately assess the effectiveness of the surcharge policy, all students in the sample must have received the notifications of and advisement about the policy in a consistent manner after their entry into postsecondary institutions. Two- and four-year institutions traditionally serve different demographics of students. It would not, therefore, be surprising to find that the same data analyses using the entire undergraduate student population may not coincide with the findings of this study. In turn, implications of this study might not apply to the transfer students. Moreover, the missing transfer student population may explain why this study resulted in findings that differed from the multi-state analysis on the excess hour policy by Kramer, Holcomb, & Kelchen (2017).

Another limitation of the study is that the data analysis was based on admission cohorts at one state university from over 6 years ago. Twelve institutions of the Florida state university system differ from one another regarding admission selectivity, student populations, and programs offered. A similar study at another Florida public university may result in different findings. Additionally, because of this study's objective to assess the effect of the surcharge policy on within 4-year and 5-year graduation, recent admission cohorts are not used for data analysis, as students have not spent enough time in college yet for comparison. Furthermore, this study was not able to include the comparisons of different credit limits and surcharge rates in the analysis because among the six post-policy admission cohorts examined, five of the cohorts were

under the 120 percent limit and 50 percent rate, and Fall 2011, the most recent cohort in the analytical sample, was the only one under another limit (i.e., 115 percent) and surcharge rate (i.e., 50 percent); therefore, the impact of the policy adjustments are yet unknown. Lastly, the limited data available to this study did not enable the author to examine if the surcharge policy decreases excess credits taken by state university students.

Conclusion

This study took the first step in examining the association between excess hour surcharge policy and students' college completion and demonstrated the positive correlation of the policy with 4-year degree graduation. However, the study and its limitations raised some unanswered questions for future research opportunities. The effect of the surcharge policy on state college transfer students is still unknown. Three factors that may cause the policy to impact transfer students differently are as follows:

- exemption of credits earned through the accelerated mechanism such as advanced placement, International Baccalaureate, and dual enrollment,
- no surcharge requirement at state colleges, and
- more diverse student demographics state colleges serve.

The Florida state statute does not count college credits that students complete while enrolled in high school towards credit limits. Students who gain admission into state universities typically complete several general education courses, such as English composition I and II, American history, and college algebra, through the accelerated mechanisms. Having such credits not only strengthens their college applications but also shortens their time to degree.

For example, if a first-year student enters one of the Florida state universities in August 2017 with no college credit, he must complete the entire 120 credits to earn a bachelor's degree. A freshman who matriculates at the same time with 15 college credits through advanced

placement courses that count towards her degree requirements would only have 105 credits to complete at the university, increasing her likelihood of graduating faster than the student in the first example. Consequently, state college transfer students may not experience the positive correlation the surcharge policy with graduation by university students.

Second, although this study did not examine attempted credits as a student outcome due to data constraints, the outcome has an important implication to state college transfer students. Credits attempted at Florida two-year colleges count towards students' credit limits upon transfer to one of the state universities; however, the surcharge policy does not require state colleges to add a surcharge to students' tuition no matter how many credits they attempt at state colleges. Students are penalized by the surcharge only at state universities. Therefore, students' understanding of the policy and the repercussions of credits they attempted at state colleges are more limited than state university students who receive reminders about the policy on a regular basis. As recommended by Gunners, et al. (2013), financial incentives should be introduced to students early in their college years for them to be effective and also for students to develop necessary study skills and routines.

As briefly mentioned above, student demographics at two-year and four-year institutions are different. Transfer students from state colleges are more diverse in backgrounds than university students. Unlike traditional 18-to 24-age group at four-year institutions, they are older, part-time enrolled, and racial minority (Cohen, Brawer, & Kisker, 2014, Mullin, Baime, & Honeyman, 2015). Many have work and family responsibilities besides schools that prevent them from graduating as promptly as expected, when compared to traditional students. To make matters worse, the institutional barriers pointed out by previous research (Zeidenberg, 2012) make this student group more susceptible to extending time to degree and going over credit

limits. For these reasons, additional research is necessary to evaluate how the surcharge policy impacts the retention, graduation, and loan borrowing of state college transfers. A follow-up study should also examine transfer rates among state college transfers, as one European study found that an excess hour surcharge increased the number of students transferring out to a state with no additional fee (Heineck, et al., 2006). As some Florida state colleges now offer 4-year degree programs, some students may opt to complete bachelor's degrees at two-year schools where they can avoid the surcharge caused by the excess hour policy.

Another future research opportunity related to the excess hour surcharge policy is to examine the effect of the policy on students' credit-taking behavior to see if the policy not only decreases time to the degree but also decreases the number of credits students attempt towards bachelor's degree. Lastly, the surcharge policy may cause some students to opt out of various opportunities available at colleges, including study abroad, optional minors and so forth, to avoid the extra fee. A qualitative study investigating students' satisfaction with a college education will provide stakeholders with in-depth knowledge of the impact the policy has on students' college experience.

The Florida legislature implemented the excess hour surcharge policy at Florida public universities in July 2009 to improve the efficiency of degree production. Although 8 years have passed since the introduction, the effectiveness of the policy in improving graduation rates was unknown. It was the author's concern that the surcharge policy merely shifts the financial responsibility of educating Florida residents from the state government to students themselves and their families instead of urging students to graduate promptly. This study served as a much-needed evaluation and found the surcharge policy to be positively associated with bachelor's degree graduation. Additionally, the results identified student characteristics that predispose students to spend the extended time to degree completion.

Although several retention and graduation strategies utilizing tuition incentives exist at colleges and universities, empirical evidence on the effectiveness of such strategies is scarce. The findings from this study contribute to filling the gap in the literature and offer future research opportunities to advance the understanding of financial policies. It is not a simple task to increase college graduation rates due to myriad factors involved and the difficulty in positively affecting one factor without worsening another. Moreover, the increased diversity in student population makes matters more complicated, as one solution could never fit all students' circumstances. To be accountable for numerous stakeholders in higher education—policymakers at federal and state levels, governing or coordinating boards, non-profit educational organizations, the public, and workforce—postsecondary institutions engage in a balancing act to try to meet the expectations of each group. Higher education leaders and professionals must keep students as the priority of institutional missions and advocate for the evaluation of any regulations, statutes, or mandates impacting students and their outcomes after adoption. It is critical to ensure that new policies do not cause hardship for students to achieve their educational goals.

APPENDIX A
FRESHMAN PROFILE AND ADMISSION STATISTICS

Table A-1. Freshman profile and admission statistics

	Average high school GPA	Average SAT	Average ACT	Percent admitted	Percent enrolled
Fall 2005	3.46	1161	21.9	61.14%	43.29%
Fall 2006	3.44	1166	22.3	67.29%	43.67%
Fall 2007	3.61	1177	22.5	65.24%	39.36%
Fall 2008	3.58	1191	24	55.79%	36.19%
Fall 2009	3.49	1199	23.9	63.99%	35.94%
Fall 2010	3.79	1204	24	50.05%	34.13%
Fall 2011	3.84	1204	26	49.61%	32.69%
Fall 2012	3.90	1212	27	54.62%	27.29%
Fall 2013	3.95	1215	26	55.28%	27.47%
Fall 2014	3.94	1214	25.7	50.51%	26.41%
Fall 2015	4.02	1218	26.7	46.56%	23.05%

APPENDIX B
FINANCIAL AID ELIGIBILITY

Table B-1. Financial aid eligibility

Bright Futures eligibility	Eligible – 14,325	Not eligible – 5,435
Pell Grant eligibility	Eligible – 6,245	Not eligible – 13,515
GI Bill eligibility	Eligible – 330	Not eligible – 19,430

Table B-2. Multiple financial aid eligibility

All three types		55
Two types	Bright Futures and Pell Grant	4,519
	Bright Futures and GI Bill	121
	Pell Grant and GI Bill	53
One type only	Bright Futures	9,630
	Pell Grant	1,618
	GI Bill	101
None		3,663

APPENDIX C
ACADEMIC MAJOR CATEGORY

Table C-1. Academic majors included in the seven categories

Category	Majors
Art	art, art history, fine arts, music, music jazz studies, music performance
Business	accounting, building construction/construction management, business management, economics, finance, financial services, international business, marketing, sports management, transportation and logistics
Education	art education, elementary education, English education, mathematics education, middle school education, music education, physical education, pre-K/primary education, science education, special education
Health	athletic training, health administration, health science, nursing, nutrition and dietetics
Liberal Studies /Interdisciplinary Studies	Interdisciplinary sciences, interdisciplinary studies, liberal studies
Language	American sign language/English interpreting, English, French studies, literature, Spanish
Social Science	anthropology, history, international studies, philosophy, political science, religious studies, social studies, sociology, social work
STEM	biology, chemistry, civil engineering, computing, electrical engineering, mathematics, mechanical engineering, physics, statistics

APPENDIX D
NOTIFICATION SAMPLES

Initial Notification

Information Hold

An informational registration hold has been placed on your account so we may deliver important information to you. Please carefully read the information below and follow the direction of automatically clear this hold.

Excess Hours Surcharge

The Florida Legislature established a law in 2009 to encourage undergraduate students to complete their degrees in the most efficient way possible. The Law ([Florida Statute 1009.286](#)), as amended, requires universities to charge students an additional fee for excess attempted hours (i.e., courses completed, failed, withdrawn). For a complete definition of what comprises "attempted" hours, refer to subsection (3) and (4) in Florida Statute 1009.286.

Referred to as the Excess Hours Surcharge, students who started college between fall 2009 and summer 2011 will be charged a fee equal to 50 percent of the tuition rate for each credit hour in excess of 120 percent of the number of credit hours required for the undergraduate degree, provided they remain continuously enrolled.

Students who started college between fall 2011 and summer 2012 will be charged a fee equal to 100 percent of the tuition rate for each credit hour in excess of 115 percent of the number of credit hours required for the undergraduate degree, provided they remain continuously enrolled.

Students who started college in the fall 2012 or later will be charged a fee equal to 100 percent of the tuition rate for each credit hour in excess of 110 percent of the number of credit hours required for the undergraduate degree.

Students who are eligible for the Excess Hours Surcharge and break continuous enrollment after fall 2012 by not enrolling for two consecutive semesters and not registering for the third consecutive semester before the first day of that term will, upon their return to the University, be subject to the 110% credit hour threshold and 100% surcharge.

Most (not all) undergraduate degree programs require 120 semester credit hours for graduation; thus, students who started college between fall 2009 and summer 2011 and attempt 144 or more semester credit hours will be subject to this surcharge.

Students who started college between fall 2011 and summer 2012 and attempt 138 or more semester credit hours will be subject to this surcharge.

Students who started college in fall 2012 or later and attempt 132 or more semester credit hours

will be subject to this surcharge.

You should speak with your academic advisor regarding how many credit hours are required for your bachelor's degree program. This law applies to students entering a state university, Florida community college, or state college for the first time.

By checking here and clicking the Submit button below I confirm I have read this notification and understand the University's responsibility to assess the Excess Hours Surcharge in accordance with Florida State Law.

After reviewing the information above, check the consent box and click submit. An indication will be placed in your record that you have acknowledged this information and your hold will be lifted.

Second Notification

Attempt hours equal to 90 percent of program hours

Dear <Student name>,

Our records indicate that you are approaching an important milestone, and the University believes you should be aware of any potential impacts. Based on the accumulation of attempted credit hours, you are approaching the threshold where you could be impacted by the Excess Hour Surcharge.

In 2009, the Florida Legislature implemented Section 1009.286, Florida Statutes to encourage students to complete their baccalaureate degree as quickly and efficiently as possible. It established what is commonly referred to as an "Excess Hour Surcharge."

The law requires universities to add a surcharge to each credit hour attempted in excess of the total number of credit hours required to complete your degree. The amount in excess of the total hours is calculated based on a percentage defined in law and is referred to as Excess Hour threshold. The amount charged per credit hour is a calculated amount referred to as the surcharge.

To aid you in understanding how this law may impact your future fee assessment, the University has provided information within online portal related to the Excess Hour threshold and surcharge. This information may be found within the *Student Records* area of your *Student Self Service* menu.

General information regarding the Excess Hour Surcharge, including a link to the Statute, may be found online.

If you are not already doing so, I recommend you work closely with your academic advisor regarding the remaining requirements for graduation, and I wish you well as you work to complete your degree.

If you have additional questions regarding the Excess Hour Surcharge, please visit our website. If you have concerns regarding the law, please contact your elected official in the Florida Legislature.

Third Notification

Attempt hours equal to 100 percent of program hours

Dear <Student name>,

Our records indicate that your total attempted credit hours are equivalent to the total credit hours required for your degree and future course fee assessments may include Excess Hour Surcharges.

In 2009, the Florida Legislature implemented Section 1009.286, Florida Statutes to encourage students to complete their baccalaureate degree as quickly and efficiently as possible. It established what is commonly referred to as an "Excess Hour Surcharge."

The law requires universities to add a surcharge to each credit hour attempted in excess of the total number of credit hours required to complete your degree. The amount in excess of the total hours is calculated based on a percentage defined in law and is referred to Excess Hour threshold. The amount charged per credit hour is a calculated amount referred to as the surcharge.

To aid you in understanding how this law may impact your future fee assessment, the University has provided information within online portal related to the Excess Hour threshold and surcharge. This information may be found within the *Student Records* area of your *Student Self Service* menu.

General information regarding the Excess Hour Surcharge, including a link to the Statute, may be found online.

If you are not already doing so, I recommend you work closely with your academic advisor regarding the remaining requirements for graduation, and I wish you well as you work to complete your degree.

If you have additional questions regarding the Excess Hour Surcharge, please visit our website. If you have concerns regarding the law, please contact your elected official in the Florida Legislature.

APPENDIX E
COMPLETE TABLE OF ATTRITION ANALYSIS

Appendix E-1. Linear probability model analyses on 1-year attrition with covariates

VARIABLES	(1)	(2)	(3)	(4)	(5)
Surcharge policy	-0.0146** (0.00676)	0.0269 (0.0265)	-0.0150** (0.00685)	-0.0122 (0.00753)	-0.0262*** (0.00784)
Female	0.00391 (0.00681)	0.00208 (0.00682)	0.00390 (0.00681)	0.00412 (0.00658)	0.00370 (0.00681)
Race					
African American	-0.0146 (0.0114)	-0.0304*** (0.0111)	-0.0146 (0.0114)	-0.0139 (0.0113)	-0.0143 (0.0114)
Hispanic	0.0393*** (0.0127)	0.0294** (0.0127)	0.0393*** (0.0127)	0.0400*** (0.0127)	0.0393*** (0.0127)
Asian/Pacific Islander	-0.0747*** (0.0110)	-0.0835*** (0.0110)	-0.0746*** (0.0111)	-0.0727*** (0.0110)	-0.0748*** (0.0110)
Other	-0.00171 (0.0228)	-0.0103 (0.0229)	-0.00203 (0.0228)	-0.00263 (0.0227)	-0.000996 (0.0227)
Financial aid eligibility					
Bright Futures	-0.0819*** (0.00953)		-0.0818*** (0.00954)	-0.0815*** (0.00952)	-0.0807*** (0.00954)
Pell Grant	-0.0820*** (0.00651)		-0.0820*** (0.00651)	-0.0821*** (0.00649)	-0.0823*** (0.00650)
GI Bill	-0.0691*** (0.0237)		-0.0694*** (0.0236)	-0.0679*** (0.0235)	-0.0703*** (0.0236)
Any financial aid		-0.101*** (0.0122)			
Policy x Any financial aid		-0.0547** (0.0273)			
Florida residency					
Non-Florida	0.00830 (0.0191)	0.00672 (0.0189)	0.00538 (0.0222)	0.00869 (0.0192)	0.00917 (0.0191)
Policy x non-FL residency			0.0101 (0.0381)		
Academic major at admission					
Art	-0.00325 (0.0157)	-0.00241 (0.0158)	-0.00325 (0.0157)		-0.00268 (0.0157)
Business	-0.00206 (0.0106)	-0.00133 (0.0107)	-0.00207 (0.0106)		-0.00258 (0.0106)

Appendix E-1. Continued

VARIABLES	(1)	(2)	(3)	(4)	(5)
Communication	-0.0227 (0.0162)	-0.0171 (0.0163)	-0.0227 (0.0162)		-0.0232 (0.0162)
Criminal Justice	0.0594** (0.0231)	0.0614*** (0.0232)	0.0594** (0.0231)		0.0593** (0.0230)
Education	0.00722 (0.0147)	0.00652 (0.0147)	0.00720 (0.0147)		0.00701 (0.0146)
Health	0.0152 (0.0114)	0.0159 (0.0114)	0.0152 (0.0114)		0.0144 (0.0114)
Language	0.0133 (0.0296)	0.0128 (0.0299)	0.0133 (0.0296)		0.0133 (0.0295)
Psychology	-0.0113 (0.0143)	-0.0134 (0.0144)	-0.0112 (0.0143)		-0.0117 (0.0143)
Social Science	-0.00448 (0.0160)	-0.00596 (0.0160)	-0.00449 (0.0160)		-0.00512 (0.0160)
STEM	0.00592 (0.0102)	0.00352 (0.0102)	0.00593 (0.0102)	0.00741 (0.0109)	0.00571 (0.0102)
Policy x STEM				-0.0104 (0.0163)	
^Other	0.0284 (0.0435)	0.0319 (0.0433)	0.0283 (0.0435)		0.0278 (0.0435)
College credits	-0.0136* (0.00724)	-0.0141* (0.00726)	-0.0135* (0.00724)	-0.0127* (0.00723)	-0.0291*** (0.00894)
Policy x College credits					0.0456*** (0.0150)
Constant	0.267*** (0.0115)	0.269*** (0.0134)	0.267*** (0.0115)	0.268*** (0.00989)	0.270*** (0.0116)
Observations	13,681	13,681	13,681	13,681	13,681
R-squared	0.025	0.019	0.025	0.024	0.026

Note: ^Other includes Liberal Studies, Interdisciplinary, Non-degree seeking.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

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BIOGRAPHICAL SKETCH

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