

HOW DOES THE 15 TO FINISH INITIATIVE AFFECT ACADEMIC OUTCOMES OF LOW-
INCOME, FIRST-GENERATION STUDENTS? EVIDENCE FROM A COLLEGE PROMISE
PROGRAM IN INDIANA

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HOW DOES THE 15 TO FINISH INITIATIVE AFFECT ACADEMIC OUTCOMES OF LOW-INCOME, FIRST-GENERATION STUDENTS? EVIDENCE FROM A COLLEGE PROMISE PROGRAM IN INDIANA

As the cost of college tuition has increased, policymakers and practitioners have begun to examine the proliferation of college promise programs (i.e., tuition-free grant programs, debt free college programs) across the United States. The purpose of this dissertation is to determine what effect a statewide 30-credit hour annual completion policy had on the academic outcomes of college promise program recipients at two 4-year public research universities, Indiana University Bloomington (IUB) and Indiana University-Purdue University, Indianapolis (IUPUI). The study examines the implementation of and subsequent policy change to the early-commitment college promise program, Indiana Twenty-First Century Scholarship (TFCS) Program.

Using administrative data from the Indiana University's University Institutional Research and Reporting (UIRR) office, representing 7,842 low-income students who enrolled shortly before the policy was implemented, this observational study employs a quasi-experimental, difference-in-differences (DiD) approach to explore the impact of the Indiana Code Title 21 (IC-21-12-6-7) (30 credit hour annual completion policy) on students' academic outcomes. Specifically, this dissertation examines the heterogenous treatment effects of this policy change on the academic performance (e.g., cumulative credit hours accumulated, cumulative grade point average [GPA], and degree completion status) of Indiana TFCS recipients at IUB and IUPUI, compared to non-TFCS Pell recipients from the same time period (Fall 2011 through Fall 2014 cohorts).

Results suggest that the 30-credit hour annual completion policy showed a modest significant effect on cumulative credits and grades, but had no effect on degree completion status (Year 4 Graduation Status, Year 6 Graduation/Enrollment Status), at IUB (a small town,

primarily residential, more selective, flagship research university). The policy had no effect on the TFCS recipients enrolled at IUPUI (an urban, primarily nonresidential, moderately selective research university). These findings demonstrate that the policy, which was related to a broader, national *15 to Finish* initiative did not produce its intended effect, nor did it have any adverse consequences for low-income, first-generation students.

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LIST OF ACRONYMS

Acronym	Definition
AASCU	American Association of State Colleges and Universities
AHEAD	Alliance for Higher Education and Democracy
ANOVA	Analysis of Variance
CAA	College Affordability Act of 2019
CCA	Complete College America
DiD	Difference-in-Differences
ECS	Education Commission of the States
FPRL	Free- and Reduced-Price Lunch Program
HLC	Higher Learning Commission
IC	Indiana Code
IBRC	Indiana Business Research Center
ICHE	Indiana Commission for Higher Education
IHEP	Institute for Higher Education Policy
IPEDS	Integrated Postsecondary Education Data System
IRHE	Institute for Research on Higher Education
IUB	Indiana University Bloomington
IUPUI	Indiana University-Purdue University, Indianapolis
NACIQI	National Advisory Committee on Institutional Quality and Integrity
NCES	National Center for Education Statistics
NSC	National Student Clearinghouse
NSSE	National Survey of Student Engagement
REL	Regional Educational Laboratory (REL) Midwest
SHEEO	State Higher Education Executive Officers
TICAS	The Institute for College Access and Success
TFCS	Twenty-First Century Scholarship
US	United States of America

CHAPTER 1: INTRODUCTION

Background

Over the last decade—and especially in recent years—college promise programs and debt free college proposals have been proliferating at both the local and state levels. These initiatives typically aim to lower or eliminate the cost of college attendance and in doing so increase college completion among underrepresented groups: predominantly low-income, first-generation, students of color (Bell, 2020). While several states and cities have announced or launched promise programs designed to improve college retention and completion, scholars of education policy and practitioners know relatively little about the implications of these initiatives, and whether certain policies or procedures are best suited to specific contexts (Perna & Smith, 2020).

In general, college promise programs or tuition-free grant programs have been advanced at the local, regional, and state levels to promote equity in higher education opportunity and outcomes. These programs provide either partial or full scholarships for students to obtain a postsecondary degree in the United States (Perna & Leigh, 2018). The Indiana Twenty-First Century Scholarship (TFCS) Program is one such college promise program first created and approved in 1990 (St. John, Daun-Barnett, & Moronski-Chapman, 2013). Introduced by Evan Bayh, the 46th Governor of Indiana, the Indiana TFCS was designed by Stan Jones, the former commissioner of the Indiana Commission for Higher Education (ICHE) who subsequently founded and served as CEO of Complete College America (CCA). The idea to establish the Indiana TFCS began in 1989, when Stan Jones was inspired by the story of Eugene M. Lang, an American philanthropist who had promised to pay for the college education of an entire 6th-grade graduating class of 61 low-income students in East Harlem, New York if they made the commitment to graduate from high school and attend college. Moved by his story, Stan Jones

incorporated elements of the I Have a Dream Foundation (IHAD) model and worked with state legislators to develop and launch the Indiana TFCS Program in fall 1990. With the support of Governor Evan Bayh, the 1990 Indiana General Assembly signed the Indiana TFCS Program into state legislation. The original law set the eligibility requirements for the program and provided a promise from the state to pay for up to four years of tuition at any public higher education institution or provide the public tuition amount toward any private institution in Indiana.

Today, the Indiana TFCS has been described by some as a national model for student success worthy of emulation when designing promise programs (Kelchen, 2017; ICHE, 2020; St. John et al., 2008). The primary objectives of the Indiana TFCS Program are to increase college affordability for low-income students, to improve high school students' academic readiness for college, to increase the diversification of the state higher education system, and to promote college success across institutions in the state (St. John, 2010). Eligible students must sign a Scholar pledge in middle school, complete the Indiana Scholars Success Program during high school, and graduate with a Core 40 diploma¹ to receive the need-based, first-dollar² financial aid award in college. Approximately 20,000 students use the scholarship each year, and, as of 2018, more than 100,000 Indiana students had received the TFCS since the program's inception in 1990. The program has had a huge impact on the state of Indiana, with over \$163 million dollars disbursed to TFCS recipients in Fiscal Year 2018 to cover tuition and fees (ICHE, 2019a).

Despite the growth of the Indiana TFCS in the past several years, with much written about the

¹ The Core 40 diploma requires all Indiana students to complete academically rigorous high school courses in the core subjects of English/language arts, mathematics, science and social studies; physical education/health and wellness; and electives including world languages, career/technical, and fine arts (ICHE, 2018b).

² First-dollar is defined as funds that are provided to TFCS students before any other financial aid grant is considered. This design allows low-income, first-generation students to acquire additional money because they can use their promise scholarship dollars with federal and/or state grant aid to cover the cost of attendance (Goldrick-Rab et al., 2016).

success of the program related to college enrollment and attendance (Davis, Guarino, & Lindsay, 2018; St. John et al., 2001, 2005, 2008, 2010; Toutkoshian et al., 2015), scholars of education policy and practitioners know relatively little about the academic outcomes of promise program recipients. Furthermore, very little research has examined the impact on the program of new policies or approaches that have been adopted by the state to improve college completion and timely graduation. As Kelchen (2017) noted in his literature review, “No recent research has examined whether the Indiana Twenty-First Century Scholars Program affected persistence or completion rates” (p. 3).

Consequently, this dissertation investigates one policy adopted and approved by the Indiana General Assembly in 2013 to improve the academic outcomes of historically underrepresented students in Indiana. More specifically, this study explores the effect of the 30-credit hour annual completion policy on college progression and completion at two 4-year public research universities that enroll many low-income students with the Indiana TFCS (see Appendix A). The goal of this research is to help fill the knowledge gap, providing policymakers, practitioners, and scholars with empirical evidence to further shape effective policy and practice to attain program goals.

Policy Issue

In May 2013, then-Indiana Governor Mike Pence signed into law House Enrolled Act 1348, which entailed changes to sections of Indiana Code Title 21 (most notably IC 21-12-6-7) that required all students receiving the need-based Indiana TFCS administered by ICHE to successfully complete a minimum of 30 credit hours every academic year to retain and renew the early commitment promise scholarship (ICHE, 2015). According to this legislation authored by Representative Tom Dermody:

Subject to IC 21-12-13-2, a scholarship awarded under section 6 of this chapter or this section may be renewed. To qualify for a scholarship renewal, a scholarship recipient must complete at least (30) credit hours or the equivalent during the last academic year in which the student received state financial aid. A recipient who fails to meet the credit hour requirement for a particular academic year becomes ineligible for an award during the next academic year (House Enrolled Act 1348).

This new policy emerged from a similar initiative adopted by the University of Hawaii in 2012 as part of the Hawaii Graduation Initiative now known as the *15 to Finish* campaign. The policy, which has been emulated in many states, aims to encourage students to take 15 credits per semester (or 30 credits per year) and thereby remain on course to complete a bachelor's degree in 4 years (Bill & Melinda Gates Foundation, 2015; Lumina Foundation, 2018; ICHE, 2020; U.S. Office of the Press Secretary, 2009). While the new legislation adopted in Indiana is an attempt by the ICHE to improve college completion and on-time graduation of Hoosiers, scholars of education policy and practitioners know relatively little about the effect of such policies. Furthermore, very few scholar-practitioners, aside from a few within the University of Hawaii system, have provided evidence that attempting to complete 30 credits per academic year significantly improves academic performance and subsequently, degree completion rates among underrepresented students (Attewell & Monaghan, 2016). Current ICHE Commissioner Teresa Lubbers admitted that "A lot is at stake for our 21st Century Scholars – if they don't complete the credit hours, they lose the scholarship and they would fall into another financial aid pool" (Smith, 2017, p. 19).

Prior to the 30-credit hour annual completion policy in 2013, a series of empirical studies revealed significant disparities in college persistence and completion for TFCS recipients across

all Indiana public and private universities (Ashcraft et al., 2017; St. John et al., 2006; St. John et al., 2008). As an illustration, Toutkoushian et al. (2015) longitudinal study found that TFCS recipients were 2.4% more likely to enroll in postsecondary education than non-recipients. However, the authors cautioned that “many students who signed up for the TFCS program do not complete it” (p. 63) and that the positive effects of the TFCS on college completion were relatively small. The authors suggest that financial constraints, including potential loan debt, prevents TFCS recipients from continuing in college. In a similar study, St. John et al. (2008) provided evidence that the Indiana TFCS Program has a small, positive, and indirect impact on academic performance and college completion. The study provided evidence that recipients of the need-based financial aid program did not significantly differ from other low-income students who had enrolled in college without the scholarship. A follow-up study by St. John, Hu, and Fisher (2010) and Jarquin et al. (2019) concluded that the lack of student support services and communication strategy for TFCS on-campus has contributed to the low completion and degree attainment rates across Indiana colleges and universities.

Statewide, between one-quarter and one-third (29%) of low-income students who receive the need-based Indiana TFCS completed their baccalaureate degree on-time (within 4 years) at all public institutions in 2018, which is far below the U.S. national average on-time completion rate of 39.8% for non-low-income students (ICHE, 2019b; NCES, 2018h). More specifically, when considering the type of institutions in their analysis, the staff of ICHE (2019b) found that 4-year, predominantly or entirely commuter campuses had a 24.7% on-time completion rate for Indiana TFCS recipients in 2018, compared to 4-year residential colleges with a 42.4% on-time completion rate of Indiana TFCS recipients. Still, more than half of Indiana TFCS recipients at residential campuses and two third at predominantly commuter campuses did not complete their

college degree on-time. The report concluded that minorities (including most Black/African American students) who receive the Indiana TFCS were less likely to persist into the fall of their second year, compared to White/Caucasian students. The study cited poor academic performance and the lack of college knowledge (i.e., intellectual and academic capital) as two primary factors that have contributed to the increasing time-to-degree rate of Indiana TFCS recipients. While ICHE (2019b) suggests that the proportion of TFCS recipients completing 15 credits per semester has slightly improved since the adoption of the new policy in Fall 2013, the ICHE report did not provide conclusive evidence that on-time or other graduation rates have improved for TFCS scholars as a result of the policy.

Purpose of the Study

This study explores the policy effect of the TFCS 30-credit hour annual completion policy on college progression and completion among underrepresented college students (e.g., low-income, first-generation, students of color) at Indiana University Bloomington (IUB) and Indiana University-Purdue University, Indianapolis (IUPUI). The study uses secondary administrative data from the Indiana University's University Institutional Research and Reporting (UIRR) extracted from the University's operational student information systems to determine whether there were differences between the academic performance of TFCS recipients who enrolled before and after the relevant changes in Indiana Code Title 21 were implemented in 2013. To date, no longitudinal study has examined the impact of the 30-credit hour completion policy on academic outcomes of Indiana TFCS recipients (Perna & Smith, 2020). Utilizing a quasi-experimental method (Difference-in-Differences testing, or DiD), this study will explore the effects of the policy on student academic performance between 2011 and 2014 among Indiana TFCS recipients, comparing their outcomes with a relevant comparison group: first-time,

full-time, state resident beginners at IUB and IUPUI who were awarded the Federal Pell Grants but did not received the TFCS (Non-TFCS Pell Recipients).

IUB and IUPUI have adopted several new initiatives and policies to improve time to degree for all students. For example, IUPUI introduced the *15 to Finish* initiative in 2013 as part of their strategic plan to encourage all students to enroll in 15 credits per semester (or 30 per academic year) for timely graduation (IUPUI Strategic Plan, 2013). To ensure active participation, IUPUI offered and disseminated completion grants (i.e., emergency funds) in 2017 for students who were close to graduate but may have fallen short of unmet need. These grants funded by the U.S. Department of Education's Institute of Education Sciences (IES) seek to improve college completion rates at up to 10 Association of Public and Land-grant Universities (APLU) member institutions as part of the *15 to Finish* campaign (IUPUI News, 2017). These initiatives illustrate that Indiana public institutions have adopted several new policies and procedures to improve college completion and time to degree for all low-income, first-generation students at both IUB and IUPUI. Given the relatively low college retention and completion rates of Indiana TFCS recipients, a longitudinal study that examines the policy effect of the TFCS 30-credit annual completion policy on academic outcomes is needed to understand how the policy has influenced degree completion among low-income, first-generation college students. Very little research has examined the significant impact of the 30-credit hour annual completion policy on academic performance and, more specifically, the policy adoption of IC 21-12-6-7 among Indiana TFCS recipients (Perna & Smith, 2020). Because on-time degree completion initiatives are designed to improve on-time completion rates and overall higher education attainment outcomes, scholars of education policy studies and advanced practitioners should assess whether such policies achieve their objectives. Hence, this longitudinal empirical study attempts to build

upon prior quasi-experimental investigation by Bell (2020), Perna and Smith (2020), Gurantz (2020), Gershenfeld, Zhan, and Hood (2019), Nguyen (2019), Davis, Guarino, and Lindsay (2018), Kelchen (2017), Postsecondary Analytics (2017), ICHE (2015, 2016, 2017), and Gross et al. (2015) studies which call upon scholar-practitioners and public policymakers to assess the longer-term effects of need-based promise programs on college progression and completion. It is anticipated that this dissertation study will provide policymakers and practitioners with evidence-informed results on the impact of degree completion initiatives among promise program recipients.

Guiding Research Questions

Informed by the on-going policy changes at the Indiana Commission for Higher Education (ICHE) and the demand to produce equity-oriented research of policies, this research will be guided by the following research questions:

1. To what extent did the 30-credit hour annual completion policy (*15 to Finish*) achieve its intended effects: increasing credit accumulation, improving student progress and increasing graduation rates?
2. To what extent are any of the identified policy effects moderated by demographic factors (race, gender, generation) and pre-college characteristics (high school GPA, SAT score)?
To what extent does the policy appear to have differential effects for various types of students?

Significance of the Study

Since 2012, Complete College America (CCA) and the University of Hawaii have built a strong collaborative working relationship to encourage other states and institutions to adopt and implement *15 to Finish* policy initiatives as a national completion strategy to improve on-time

graduation and overall degree completion rate of students. While recent research has shown that taking 15 credits per semester has increased college retention and completion rates across the University of Hawaii system (CCA, 2018), scholars and practitioners do not know whether or how such an initiative will work for different types of students (e.g., low-income, first-generation, students of color) – particularly those who have been historically excluded from and served least by the existing policies and practices (Perna & Smith, 2020).

There is a growing body of literature that examines what makes lower-income students at risk for not completing college in comparison to middle- or upper-class socioeconomic class peers (Perna & Finney, 2014). Some research points to: student academic and social experiences transitioning into college (Lin, Chen, & Borden, 2020); students lacking college knowledge or college skills (Perna & Hadinger, 2012); limited financial aid to support the direct or indirect costs of attendance (Britt, Ammerman, Barrett, & Jones, 2017); limited family support (Roksa & Kinsley, 2018); and unwelcoming campus environments and cultures (Museus, Yi, & Saelua, 2017). Other research has shown that personal attributes contribute to college student departure (Braxton, Hursch, & McLendon, 2004), including study habits, motivation for success, and goal commitment (Stebbleton, Soria, & Huesman, 2014). More recent studies have also pointed out that out-of-school factors, such as homelessness, hunger, and physical and mental health also affect students' academic learning and thereby contribute to student dropout (Goldrick-Rab, Broton, & Hernandez, 2017; Goldrick-Rab et al., 2018). While all these factors are essential, there is an absence in the literature of studies that examine how local, state, regional or federal policies interact with and contribute to college completion of promise program recipients. Because policy mandates are generally vague and allow considerable leeway to execute procedures (Ring & Perry, 1985), new types of publications (e.g., policy briefs, scholarly

articles, dissertations), approaches (e.g., community engaged research, participatory action research), and techniques (e.g., difference-in-differences testing, propensity score matching, narrative analysis, critical discourse analysis) can be used to understand the policy effect of legislation like the Indiana TFCS 30-credit completion policy on low-income TFCS students.

Consequently, this policy evaluation research is significant for various policy actors and higher education professionals seeking to improve college completion and on-time graduation of promise program recipients. On the one hand, knowledge gained from this study will provide empirical results to local and state policymakers that can be useful in implementing policies that improve TFCS outcomes. On the other hand, knowledge obtained may aid practitioners and community supporters in designing college promise programs that are built for completion in ways that best promote graduation for historically underrepresented groups. As the Indiana TFCS Program funds students up to 4 years of college tuition, this study adds to an on-going effort by higher education institutional agents (e.g., presidents, vice presidents, financial aid officers, academic advisors), non-profit organizations (e.g., Lumina Foundation, The Education Trust, Council for Opportunity in Education (COE), The Institute For College Access and Success (TICAS), Institute for Higher Education Policy (IHEP), National College Access Network (NCAN)), and government-related organizations (e.g., Education Commission of the States (ECS), State Higher Education Executive Officers Association (SHEEO), Regional Educational Laboratory (REL) Midwest) to improve the college completion and on-time graduation rates of underrepresented students and to implement necessary actions or guided pathways for low-income families. It is anticipated that this academic policy study will expand research-based knowledge about the impact of college promise programs on student success, and the outcomes of such credit completion initiatives for historically underrepresented populations.

Further, this study is anticipated to assist policy implementers, public servants, and bureaucrats to make data-informed decisions that can contribute to improving college progression and completion at postsecondary institutions (Chan, 2019). Ultimately, this dissertation is designed to critically advance more equitable policy and practice in higher education on the opportunities and outcomes for underrepresented groups enrolled in a college promise program as well as to further advance the movement around such initiatives that drive graduation success in local communities (MDRC, 2019; Perna & Smith, 2020).

Definition of Key Terms

The following key terms that appear throughout this dissertation are defined below, in alphabetical order.

College Promise Programs. Defined as “tuition free” or “free college” programs that cover student’s mandatory tuition and fees beyond existing grant aid. It does not include room, board, textbooks, and other indirect costs from other sources (Perna & Smith, 2020).

Cohort: A specific group of students established for tracking purposes (NCES, 2018h). Cohorts include students enrolling as first-time, full-time (12 or more credits) degree-seeking students in the fall or prior summer of a given year.

College Completion. College completion is defined as the attainment of a targeted objective, most usually applied to a degree (e.g., associates, bachelor’s) or other credential, but also can be applied to other student/institutional objectives or milestones (Borden & Holthaus, 2018).

College Completion Rate. College completion rate is defined as “the attainment (or rate of attainment) of a degree, other formal award, or other completion goal by a student (or among a cohort of students)” (Higher Learning Commission [HLC], 2019c, p. 3).

Credit Hour Requirements. Defined as “the credit hours required to earn a credential; should be in line with academic standards such as 120 credit hours for a bachelor’s degree” (Tandberg, Bruecker, & Weeden, 2019, p. 25).

Cumulative Credit Hours Completed. The total number of credits students earn after successfully completing course(s) (obtaining passing grades) during a specified time period (e.g., semester, academic year, etc.) at a postsecondary institution (Attewell & Monaghan, 2016).

Cumulative GPA. The cumulative grade point average (GPA) (on a 4-point scale, for the institutions in this study) calculated on all credit-bearing work attempted at a postsecondary education institution.

Debt Free College. Debt free college proposals includes full tuition and other elements of student need, such as room and board, transportation, books, and childcare. One example is the Debt Free College Act of 2019, which was introduced in the U.S. Senate by Senator Brian Schatz of Hawaii. The bill proposes to establish a federal-state grant program that would require state public institutions to provide students with the full estimated cost of attendance (Senate Bill 674 (2019)).

Educational Intent. Defined as “the educational objectives that a student has upon entry or develops through interaction with an institution’s programs, supports, and staff. This intent can include an array of educational objectives such as taking a course or courses to improve a certain skill or to transfer the credit elsewhere, earning a badge or certificate, and/or earning a degree” (Higher Learning Commission [HLC], 2019b, p. 3).

First-Generation College Student. Defined by Indiana University (IU) as a student, “neither of whose natural or adoptive parents received a baccalaureate degree” (IU University Institutional Research and Reporting (UIRR), 2019).

First-Time Student (undergraduate). Defined as “a student who has no prior postsecondary experience (except as noted below) attending any institution for the first time at the undergraduate level. This includes students enrolled in academic or occupational programs. It also includes students enrolled in the fall term who attended college for the first time in the prior summer term, and students who entered with advanced standing (college credits or postsecondary formal award earned) before graduation from high school” (NCES, 2018f, p. 11).

Full-Time Student. Defined as “Undergraduate: A student enrolled for 12 or more semester credits, or 24 or more clock hours a week each term” (NCES, 2018h, p. 14).

Graduation Rate (100%, 150%, 200%). Graduation rate is defined as “the proportion of an adjusted cohort (i.e., a cohort minus allowable exclusions, like students who are called up for military duty, serv on a religious mission or those deceased) that graduates in either: 100%: the nominal time of the program (2 years for associate’s degree, 4 years for bachelor’s degree, or as appropriate to type of certificate or other award); 150%: 1.5 times the nominal time (3 years for associate’s, 6 years for bachelor’s degrees, etc.); or 200%: twice the nominal time for a degree, certificate or other formal award” (HLC, 2019c, p. 5).

Low-Income College Student. A low-income college student is defined as an “individual from a family whose taxable income for the preceding year did not exceed 150% of an amount equal to the poverty level determined by using criteria of poverty established by the Bureau of the Census” (Higher Education Act of 1965, Chapter 1(h), 1965).

On-Time Completion. On-time completion is “the attainment of target objective, most usually applied to degree or other credential, but also can be applied to other student/institutional objectives or milestones” within the nominal years required for the objective (e.g., 4 years for a bachelor’s degree, 2 years for an associate’s degree) (HLC, 2019b).

Persistence. Persistence is defined as “a student-centered metric focused on behaviors that indicate continued enrollment. This may or may not be indicative of ongoing enrollment that fulfills a program of study or the student’s stated educational intent” (HLC, 2019c, p. 3).

Progression: Progression is defined as “the demonstrated student progress toward the formation and completion of their educational intent over an acceptable period of time” (HLC, 2019b, p. 3).

Retention. Retention (institution focus) is “the continued enrollment of students from one specified timepoint to the next” (HLC, 2019c, p. 5).

Retention Rate: Retention rate is defined as “the percent of the adjusted prior fall semester cohort that re-enrolled at the institution as either full- or part-time in the current year” (HLC, 2019c, p. 5).

Underrepresented College Student. Underrepresented college students are individuals with certain characteristics who are less represented than others in higher education. These include students from certain racial/ethnic minority groups (e.g., African Americans, Hispanic/Latinos, American Indians), low-income students, first-generation students, students with disabilities, independent students, homeless student, and students in foster care.

Study Goals

This quantitative study is designed to achieve the following goals:

- Understand and test the effect of the 30-credit hour annual completion policy on college progression and completion of underrepresented college students in an early-commitment first-dollar, full-tuition college promise program.
- Identify the relationship between low-income, first-generation student characteristics and academic outcomes (e.g., Year 1 Cumulative Credits, Year 1 Cumulative GPA).

- Inform educator-scholars and education practitioners on issues related to academic progress requirements in a need-based, first-dollar, full-tuition college promise scholarship program.

Overview of Dissertation

This study is organized into five chapters. The first chapter introduces the adoption and issue related to the Indiana TFCS 30-credit hour annual completion policy. The first chapter also outlines the guiding research questions, significance of the study, and defines key terms. The second chapter presents a review of the relevant theory and literature related to underrepresented college students' success; recent research on the emergence of college promise programs and need-based financial aid; and new policies and procedures adopted by policymakers to encourage undergraduate students to complete 30 credits per academic year. The third chapter presents the research methodology and study design used in this dissertation, including research questions, data sources, dependent variables, independent variables, difference-in-differences (DiD) technique, and limitations of the study. The fourth chapter provides the results of the study as framed by the research questions. The final chapter includes a summary of the study, discussion of research results, implications for practice, and recommendations for future research.

CHAPTER 2: REVIEW OF RELATED THEORY AND LITERATURE

Introduction

College retention and completion have been the focus of much research effort among higher education scholars. Researchers studying the subject investigate issues pertaining to student learning outcomes, student persistence and retention, and student completion and graduation rates (Lin, Chen, & Borden, 2020). College promise programs (i.e., tuition-free grant programs) have largely been overlooked in this body of literature (Gross, Williams-Wyche, & Williams, 2019; Perna & Smith, 2020). To illustrate this point, the American Association of State Colleges and Universities (AASCU) (2018) places college affordability (e.g., free college proposals, changes to tuition policy) as one of the top three policy issues facing higher education institutions across the states in 2018. The College Affordability Act (CAA) of 2019 released by Rep. Bobby Scott (D-VA) is a prime example of state politicians desire to lower the cost of college for students and families by reinvesting in higher education. Researchers and practitioners alike cite college costs as the primary barrier to college completion and on-time graduation (The Institute for College Access and Success (TICAS), 2018a; SHEEO, 2019). This omission in research suggests the need to study college promise programs, what they are, and how they influence the academic outcomes of low-income, first-generation students.

This chapter provides an overview of research relating to college promise programs, postsecondary participation, and academic success (progress, retention, and completion) of low-income, first-generation students. The chapter opens with a discussion of the literature on student success, highlighting the demand to graduate more students on-time. The chapter then reviews the complex factors that affect college completion and timely graduation of low-income and first-generation students across the United States including economic, social, and global changes

especially since the Great Recession in 2009. Afterward, the chapter reviews the literature relating to credit hour accumulation and completion in higher education pertaining to historically underrepresented groups. The chapter concludes with an overview of college promise programs and the context in which they are developed and implemented, with special attention to the need-based Indiana Twenty-First Century Scholars (TFCS) Program. Ultimately, the goal of this chapter is to present existing research on the complexities of college completion and graduation rates of low-income and first-generation students who receive a promise scholarship in higher education.

The process employed included a review of relevant articles using EBSCOhost, ProQuest, Google Scholar, and Refworks. Literature reviewed in this chapter focuses on articles from the leading educational research journals (e.g., *Journal of Higher Education*, *Research in Higher Education*, *Educational Evaluation and Policy Analysis*, *Review of Higher Education*, *Education Finance and Policy*), book chapters (Perna & Smith, 2020; Miller-Adams, 2015), reports from relevant government agencies (e.g., National Center for Education Statistics (NCES), National Advisory Committee on Institutional Quality and Integrity (NACIQI), U.S. Bureau of Labor Statistics), policy briefs from relevant non-governmental organizations (e.g., State Higher Education Executive Officer (SHEEO) Association, Lumina Foundation, Complete College America (CCA), Education Commission of the States (ECS), Institute for Higher Education Policy (IHEP), The Pell Institute for the Study of Opportunity in Higher Education, The Education Trust, Midwestern Higher Education Compact), and the higher education news media (e.g., *The Chronicle of Higher Education*, *Inside Higher Ed*). The limitations of previous studies are discussed within each section, and gaps in the literature on the relationship between underrepresented students and academic outcomes are identified. In some cases where past

findings from a study was unclear, e-mail contact was made with policy experts from the ICHE made possible through the author's current role at the IUB TFCS Program. Given that college completion and on-time graduation is a national priority for institutions of higher education, this literature review chapter will present data and results from across the United States and will not solely focus on Indiana.

Literature on Student Success

The literature on higher education student success reveals that persistence and progression is a necessary element for degree completion. Today, there are a wide number of definitions and theories of student success that are published in the higher education literatures (Borden & Holthaus, 2018; Higher Learning Commission (HLC), 2019a; Stiles, Wilcox, & Robinson, 2018). Kinzie and Kuh (2016) argue that student success can infer individual achievement, group achievement, and/or college impact and effectiveness, with multiple theoretical approaches informing the understanding of student success at various levels. The Higher Learning Commission (2019b) suggests that "student success may be based on measures of time spent in academic or other programs, or on rates of attainment of degrees, certificates or other formal credentials. They may also be based on measures of satisfaction of the students with their experiences in the program or initiative" (p. 5). While these reports do not offer a one-size-fits-all definition of student success, as success may be defined differently by students, administrators, faculty members, and policymakers, it is evident from the reports that the meaning includes both academic progress and completion measures as well as learning and developmental outcomes. As noted by the HLC (2018a), "Student success has become intricately linked with the completion agenda, emerging from concerns regarding the U.S. falling behind in degree attainment internationally, issues of institutional funding and rising student debt,

increasing numbers of students leaving with debt and no credentials, and ongoing employer needs to find qualified workers” (p. 1).

Indeed, one can argue that the driving force behind several college completion initiatives and institutional change efforts at the local, state, and national levels can be considered a “student success movement.” There are competing pressures on and in higher education to graduate more students on-time coupled with significant increases in college tuition and living expenses; the proliferation of college promise programs at both the local and state levels; and current financial aid policy reforms that will affect college enrollment and completion in new, profound ways (Kelchen, 2018; SHEEO, 2019). A recent example of these tensions relates to whether undergraduate students, regardless of their academic preparation or family’s education in the first year of college (Hurtado, Nelson Laird, & Perorazio, 2004), should take 15 credits each semester (or 30 credits per academic year) for timely completion at 2- and 4-year institutions. Practitioners and policymakers have been asking this core question since the *15 to Finish* campaign was endorsed by Complete College America (CCA) in 2013 (Postsecondary Analytics, 2017). Will the campaign improve college retention and completion rates? Will the investment of time and money pay off? The answer to that question depends on what outcomes matter or matter most.

In the twenty-first century, college and university educators face increasing public and private pressures to educate a more diverse population for a wide range of careers, with increased reliance on funding from students and families (Chan, 2016). Educators are also at a point in higher education history of ensuring that the student population, more closely than ever before reflect the general population considering changing demographics and technology. In this context, what matters most in terms of student success may differ according to educational

intent. At the same time, what matters most may differ according to institution mission and vision and how institutions are attempting to redesign themselves for student success (Rutherford, 2016). Consequently, student success is not just about helping individuals graduate with a certificate or degree but also redesigning institutions to support diverse student populations tailored to their academic potential. Stiles, Wilcox, and Robinson (2018) present a variety of factors that can impact student success including academic rigor, geography, mental health, social or psychological factors, high school preparation, social climate, and substance use and abuse. While these are all factors that many scholars and practitioners have identified in the past, very few have disaggregated their data to provide a more nuanced picture beyond first year students and those from low-income, first-generation background (Civitas Learning, 2018; Parnell, Jones, Wesaw, & Brooks, 2018).

As a result, the following section offers a synthesis of the current research on student success, with special attention to low-income, first-generation students. Specifically, the next section provides data from the National Center for Education Statistics (NCES) and National Student Clearinghouse (NSCH) to describe students currently enrolled in U.S. postsecondary education institutions, with an emphasis on progression rates at public 4-year institutions. Because bachelor's-degree-granting institutions report the four-, five-, or six-year completion rate of first-time, full-time students, this literature review will not only focus on timely graduation rate (100% of program completion time) but also delayed graduation rate (150% to 200%), with special focus on six-year completion and graduation rates, which are the most commonly used measures, due to the evolution of federal reporting requirements.

National Trends in College Completion and Graduation Rates

Retaining and graduating college students is a central issue for many institutions of higher education across the United States. The National Center for Education Statistics (NCES) (2018c) notes that postsecondary institutions conferred 1.9 million bachelor's degrees in 2015–16, an increase of 54% for bachelor's degrees since 2000–01. U.S. adults ages 16-34 (born after 1980) are on track to be our most educated generation ever as college enrollment and degree completion have improved over the past few decades (ETS, 2016). Between 2010 and 2016, the overall six-year graduation rate for first-time, full-time students increased by 1%, from 58% to 59%. Six-year graduation rates were higher in 2016 than in 2010 at public institutions (59% vs. 56%) and private institutions (66% vs. 65%) but lower at private for-profit institutions (23% vs. 29%) (McFarland et al., 2018, p. 202). For example, the overall rate of first year, full-time students who remained enrolled at their initial public 4-year institution was 81% in 2015-16, compared to least selective public institutions (i.e., open admissions) at 62% (NCES, 2018f). Using data from the Integrated Postsecondary Education Data System (IPEDS)³ NCES (2018f) reports that the six-year graduation rate (150% of nominal program completion time) for first-time, full-time undergraduate students who began seeking a bachelor's degree at a 4-year public degree-granting institution in fall 2010 was 59%, with graduation rates higher for females (62%) than males (56%). In addition, the six-year graduation rate for males increased from 54% to 56% (McFarland et al., 2018, p. 202). Only about four in ten (42%) black students who start college as first-time, full-time freshmen earn bachelor's degree at their origin public institutions within 6 years – a rate 22 percentage points below that of their white peers (NCES, 2015).

³ The Integrated Postsecondary Education Data System (IPEDS) graduation rates are reflective of full-time, first-time, degree-/certificate-seeking students who started and finished at the same institution. Students included in graduation rates do not represent all of the students at an institution (e.g., part-time and transfer students).

Using a different approach that tracks students across institutions, the National Student Clearinghouse (NSC)⁴ derives national six-year completion rate of 65.7% for the fall 2012 cohort, an increase of 1.5 percentage points from the fall 2011 cohort (Shapiro et al., 2018). Specifically, Shapiro and colleagues found a 5-percentage point increase in the overall completion rate, from 60.6% for the 2006 cohort to 65.7% for the 2012 cohort. The most increases were found in the rate for black (47.6%) and Hispanic (57.4%) students, a 1.6 percentage points and 1.7 percentage points increase, respectively. Shapiro et al. (2018) speculate that college retention and completion rates have increased because students have access to more of the programs, tools, and support they need to succeed. While more underrepresented minority groups are completing postsecondary degrees across the United States, Asian and white students continue to graduate at much higher rates (76.7% and 72.1%, respectively) than black and Hispanic students (Shapiro et al., 2018).

Postsecondary Education Attainment and Participation Rates

Postsecondary education attainment and participation rates have increased for all underrepresented student groups (e.g., students of color, first-generation). NCES (2018d) projects that postsecondary attainment and participation rates will increase 15% for 18-24 years old from 2014 to 2026. The projected increase in education attainment rates for all racial/ethnic and income groups fulfills the goals articulated in Lumina Foundation's (2018) *A Stronger Nation* annual report, which calls for an additional 10.9 million postsecondary credentials added by 2025. The Lumina Foundation (2018) estimates that the national postsecondary attainment rate for all degrees and certificates is 46.9% in 2016. Specifically, the report presented

⁴ The National Student Clearinghouse (NSC) includes all students: full-time and part-time, of all ages, at 2-year, 4-year, public, and private institutions, as well as those who graduated after transferring to a new college or university (unlike IPEDS). The NSCH data covers 96.8% of college enrollments across all postsecondary institutions nationwide.

educational attainment rate data at the national, state, county, and metropolitan area levels. Their data demonstrate that higher education attainment is not equal for all populations. For example, when looking by race/ethnicity, the report claims that total education attainment rates for African Americans (30.2%) and Hispanics (21.9%) lag behind Caucasians (46.4%). The Lumina Foundation (2018) reports continued opportunity gaps in college attainment between racial and ethnic groups and among low-income and first-generation students. The report concludes that to reach the overall attainment goal of 60%, an additional 10.9 million credentials would need to be added. The report projects that 35.7 million Americans will earn a postsecondary credential by 2025, which would lead to a total education attainment rate of 53.9% by that year.

It is important to note that Lumina uses four metrics to measure progress to Goal 2025: awareness, enrollment, persistence and completion. The staff of the Lumina Foundation (2018) believe these metrics are foundational for the nation to progress to a 60% attainment rate. While the number of graduates is increasing, which is positive for increasing the attainment rate, the report also highlights that enrollment rates are decreasing. Lumina believes that this is a product of an improving job market and will only be temporary. The report makes a claim that the increasing persistence rate will translate into higher completion rates in the future; however, the increase will likely continue to vary by socio-economic status, generational status, and race/ethnicity.

Indeed, a large body of research indicates that postsecondary education completion rates of 4-year bachelor's degree among low-income, first-generation students is much lower compared to their middle- and high-income continuing-generation peers. While scholars and practitioners have long explored the relationship between need-based financial aid and the academic outcomes of low-income, first-generation students, considerably less research has

employed longitudinal data on the success of these populations at 4-year public research universities (St. John, Daun-Barnett, & Moronski, 2013; Nguyen, Kramer, & Evans, 2019). Given these points, the current study aims to disaggregate longitudinal data of low-income students - TFCS recipients and non-TFCS Pell recipients - to understand their overall college completion and graduation rate at two, Midwestern 4-year public institutions.

Low-Income Students

In 2018, there were 10.9 million students in a public higher education institution, with 220,665 full-time equivalent (FTE) enrolled in the State of Indiana (a 1.0% decrease since the Great Recession) (SHEEO, 2019). Despite the small enrollment decline, low-income students now enroll in college at a higher rate than their middle-income peers across the United States (NCES, 2018a). NCES (2018a) estimates that roughly 67% of low-income students who graduate high school enroll in a college (either 2-year or 4-year) the following fall, compared to 64% of students from the middle three quintiles in 2016. This is due, in part to the increase in state public aid (8.7% increase per FTE in 2018, largest since the Great Recession), coupled with states having a performance-based funding (PBF)⁵ policies in place (Gándara & Rutherford, 2018; Tandberg et al., 2018; SHEEO, 2019). While more low-income students are participating in higher education since the Higher Education Act of 1965⁶, and the establishment of the Federal TRIO Programs⁷, NCES (2015) notes that only 41% of academically strong low-income students, those who scored in the top quartile in math, graduated from college within 6 years

⁵ Performance-based funding (PBF), commonly referred as outcomes-based funding (OBF), ties a portion of state appropriations to student outcomes.

⁶ Higher Education Act of 1965 was the legislation that governs the TRIO programs funded by the U.S. Department of Education. The law was intended “to strengthen the educational resources of our colleges and universities and to provide financial assistance for students in postsecondary and higher education.”

⁷ The Federal TRIO Programs includes Talent Search, Upward Bound, Student Support Services, Educational Opportunity Centers, and Ronald E. McNair Post-Baccalaureate Achievement Program. These programs help students to overcome class, social, academic, and cultural barriers to higher education.

compared to 74% of high-income students. The Third Way (2018) reports that under half of first-time, full-time Federal Pell Grant⁸ recipients earned a bachelor's degree within 6 years at the college where they first enrolled, and only 47% of institutions awarded degrees to more than half of their starting students who received the Federal Pell Grants. In other words, over 50% of low-income students who begin at any 4-year institution do not graduate within 6 years from that same institution. NCES (2018e) found similar preliminary results after using the winter 2016-17 survey of federal aid-eligible colleges, reporting that 41% of credential-seeking, first-time, full-time undergraduates who enrolled in 2011 and received a Federal Pell Grant earned a bachelor's degree. Another (NCES, 2018b) report suggests that these differences exist because lower-income students regularly underestimate the costs of college which can hinder their ability to enroll and persist at a 4-year public university.

One of the largest barriers to completion is the increasing cost to attend college, despite the increase in the proportion of funding allocated to public student aid (increasing from 3.6% to 8.3% between 2009 and 2019) (The Education Trust, 2019; SHEEO, 2019). Nationally, the College Board (2018) annual report, *Trends in College Pricing* found that the average tuition and fees at public 4-year universities is \$10,230 for the 2018-2019 academic year, a 3% increase when adjusted for inflation over the 2017-2018 academic year. College prices have increased at nearly five times the rate of inflation and have outpaced income growth (U.S. Bureau of Labor Statistics, 2018) (as public institutions become more dependent on tuition revenue than educational appropriations). Today, low-income families would spend 157% of their annual

⁸ The Federal Pell Grant is based upon being below an Expected Family Contribution (EFC), financial aid income threshold established by the federal government. Students must maintain full-time enrollment or the Federal Pell Grant value will be prorated based on the following enrollment levels: Full-time: 12 or more credits, full-time award; Three-quarter time: 9 to 11 credits, 75% of a full-time award; Half time: 6 to 8 credits, 50% of a full-time award; Less than half time: 1 to 5 credits, 25% of a full-time award.

income to afford one-year of college tuition at a 4-year public university, compared to high-income families at 14%, if they had to pay the full price (Institute for Higher Education Policy (IHEP), 2017). Despite recent data to suggest that 65% of bachelor's recipients at Indiana's public institutions completed college with an estimate student loan debt of \$29,561, a slight decrease from the Class of 2016 (IHEP, 2018; TICAS, 2019), the IHEP (2018) report argues that public universities are less affordable for low-income students and less accessible for members of underrepresented groups (e.g., low-income, first-generation, students of color) due to an increasing focus on admitting international and out-of-state students. The IHEP (2018) report concludes that the proportion of low-income, first-generation students graduating with a postsecondary degree in Indiana continues to fall short of expectations due to a decline in institutional resources at public universities.

Trends in College Completion

The Education Trust (2015) reported that 4-year, public colleges and universities have made progress in improving their graduation rates overall over the decade. Specifically, among the 4-year public institutions included for the analysis ($N = 225$ institutions), 77% reduced their graduation rate gaps by race/ethnicity over the last decade. Although their analysis of the Integrated Postsecondary Education Data System (IPEDS) graduation rates data highlights that even with these improvements, overall, underrepresented student graduation rates continue to lag white students by 14 percentage points and underrepresented students aren't yet graduating at the rate that white students graduated from college 10 years ago. The report concludes, "As a nation, we are nowhere near on track to close longstanding gaps between underrepresented students and white students...at least not in this century" (The Education Trust, 2015, p. 1).

This statement reflects closely the results reported in a few policy briefs that have examined the relationship between income and the success of low-income, first-generation college students in the State of Indiana (Indiana Commission for Higher Education [ICHE], 2018b; Institute for Higher Education Policy (IHEP), 2018a). For example, the ICHE (2018b) reported that on-time graduation rates for full-time, low-income students who receive the Indiana TFCS between 2011 and 2014 have increased by double digits across all 4-year public campuses, with an average completion rate of 25% compared to 45% of full-time non-TFCS who attended an Indiana public 4-year campus (see Appendix B). Among TFCS blacks and Hispanics, 23.2% and 21.3% of students versus 38.5% for all Indiana students graduated on-time (ICHE, 2018a).

Graduation Rates at Indiana University

In the past decade, on-time graduation rates of all students at Indiana University have improved (Peters, 2019). Specifically, at public institutions, 40.6% of all Indiana college students graduate on-time and nearly two-thirds of all students' complete college within 6 years (ICHE, 2019b). While more students are completing their baccalaureate degrees in Indiana (largely attributed to college participation of high school graduates) (see Appendix B), the IHEP (2018a) policy report found that low-income students have a lower chance of graduating from Indiana University Bloomington than their higher-income peers within 6 years. The report states, "In 2016, IU Bloomington graduated just two-thirds (66%) of low-income students within 6 years, compared with 79% of non-low-income students" (IHEP, 2018a, p. 4). Among Federal Pell Grant recipients, 66% graduated from Indiana University Bloomington (IUB) and 40% graduated from Indiana University-Purdue University, Indianapolis (IUPUI) ($N = 1,441$ IUB Pell recipients vs. $N = 1,065$ IUPUI Pell recipients) (Third Way, 2018). Despite the fact that college completion and on-time graduation of low income, first-generation students has continued to improve across

Indiana (see Appendix C), with several new initiatives enacted by the ICHE (2018b) (e.g., implementing the Core 40 curriculum, requiring high schools to offer dual enrollment and AP courses, revising the requirements for placing students into remedial education), the IHEP (2018a) report suggests that these groups are 13 percentage points less likely to persist through and graduate within 6 years than affluent continuing-generation students.

Given these points, the degree completion gaps between low-income and non-low-income students as evident in ICHE (2019b, 2018a), IHEP (2018a), and Third Way (2018) may be the result of several factors including the cost of attendance, Pell recipient status, employment status, dependency status, and family responsibilities. The Education Trust (2015) recommends that the ICHE should collect disaggregated data to assess which students are succeeding through the Indiana TFCS Program, and which students are being left behind. Disaggregated data will help identify barriers and will help drive equity-mindedness⁹ in policy development. The current study aims to understand this issue by using longitudinal data of Indiana TFCS recipients to examine the role that a need-based college promise program plays in a student's educational success.

Family Income

Higher education completion continues to vary dramatically by family income (Michaelmore & Dynarski, 2017). The relationship between family income and college-related outcomes has been widely documented across the United States (Alexander, Endwise & Olson, 2014; Bowen, Chingos, & McPherson, 2009; Engle & O'Brien, 2007; Cahalan & Perna, 2015; Perna & Finney, 2014; Toutkoushian et. al., 2015). Specifically, the gap between rich and poor

⁹ Equity-mindedness is referred “to the responsibility of educators to stay mindful to the individual needs of students to successful navigate through an institution and achieve their educational intent by providing the pathways and supports that leverage the abilities of each student” (Higher Learning Commission (HLC), 2019b, p. 4).

students' is larger than the gap between their college participation rates (Dynarski et al., 2015). Nationally, approximately one in four college freshmen from the bottom half of the income distribution obtain a bachelor's degree by the age of 24, compared to 90% of freshmen from families in the top income quartile at large public universities (Hamilton, Roksa, & Nielsen, 2018). While bachelor's degree attainment rates for family members in the lowest income quartile doubled between 2000 and 2015 (from 6% to 12%), the most affluent students were about five times more likely to complete college within 8-years of their high school graduation than the poorest by age 26 (58% vs. 21%) in 2017 (Cahalan et al., 2018, 2019; NCES, 2015).

Using data from the annual Current Population Survey (CPS), Cahalan et al. (2019) suggest that bachelor's degree attainment rates increased in each family income quartile over the period but remain highly unequal. Students entering college from low-income families who are also the first in their family to go on to higher education have a 21% chance of earning a bachelor's degree in 6-years. Their findings closely resemble the NCES (2015) and NCES (2018b; 2018e) reports discussed earlier in which these publications estimate that 1% of dependent family members in the lowest family income quartile had attained a bachelor's degree by age 24, compared with 20% of those in the second quartile, 41% of those in the third quartile, and 58% of those in the highest quartile (Cahalan et al., 2019). Separating the first-generation effect from the low-income effect, the Cahalan et al. (2019) report further adds low-income, not first-generation students who started at 4-year institutions had a 56% six-year completion rate, compared to 41% of low-income, first-generation students. This suggests that the effect of being a first-generation student, holding constant income, is about a 15-percentage point decrease in expected completion rate, at least for students who start at 4-year institutions. The authors suggest that the significant opportunity gaps may involve the fact that Federal Pell Grant funding

has not kept up with the rising costs of college, as Pell's purchasing power has continued to decrease. The report claims, "In constant dollars in 1980, the maximum Federal Pell Grant covered 68% of average college costs. In 2017-18, the maximum Federal Pell Grant covered 25% of average college costs (\$15,471 vs. \$5,815, respectively)" (Cahalan et al., 2019, p. 66). In other words, today's Federal Pell Grant covers the lowest share of college expenses than at any other time in the program's history. Unmet need for students in the lowest family income quartile is 250% of what it was in 1990 after taking inflation into account (\$9,143 vs. \$3,665, respectively) (Cahalan et al., 2019). Consequently, students from lower-income families are far less likely to complete a baccalaureate degree than those from upper-income families because funding for the Federal Pell Grant hasn't kept pace with the cost of college. Hence, family income is a strong predictor of postsecondary success.

Completion of Low-Income Students

Students from lower social class backgrounds earn lower grades and graduate at lower rates than their middle- and upper-class peers (Bailey & Dynarski, 2011; Bowen, Chingos, & McPherson, 2009). The completion gap between low-income students and high-income students is associated with some background characteristics and experiences including, academic preparedness, parental involvement, as well as parent's generational status (Lin, Chen, & Borden, 2020; Hamilton et al., 2018; Roksa & Kinsley, 2018). For example, the qualitative study of Hamilton, Roksa, and Nielsen (2018) explored the experiences of first-generation students and students from lower socioeconomic backgrounds. They interviewed 59 parents from 41 families of students living on the same residence hall floor at a large 4-year public institution. The authors found that a socioeconomic class difference in the parental generation leads to qualitatively different college experiences in the child generation. Even though student success is not

determined by parents' class, students from affluent families show higher rates of graduation and placement. In a different study, Roksa and Kinsley (2018) demonstrated that receiving emotional support from family impacts academic and social engagement for low-income students. Specifically, the authors surveyed 728 students in their first year at eight different 4-year institutions who had applied for financial aid in Wisconsin and found that low-income students who received more emotional support from their families were 19% more likely to have a grade point average of 3.0 or higher, 19% more likely to accumulate at least 24 credits during their first year, and 24% more likely to finish a second year of college, compared to students without family support. Roksa and Kinsley (2018) conclude that family support impacted low-income students' feelings of inclusion and sense of belonging on-campus. The authors recommended that colleges look beyond the financial and social standing of families to better retain and support low-income students.

These two articles highlight a statistically significant association between family income and completion. Family income is a consistent and reliable predictor of academic outcomes where low-income students tend to be less prepared for college than their peers. One explanation of these findings may be that lower-income families do not necessarily consider higher education to be a normative adolescent experience. Another explanation of this finding is that students from lower socioeconomic backgrounds often attend non-wealthy school districts that receive less funding per student than affluent school districts (Camera, 2018). The inequities in access to quality secondary education is associated with family income (Crosnoe & Muller, 2014). Lower-income students who graduate from wealthy high schools are more likely to persist and complete college than lower-income students who graduate from non-wealthy high schools, due to the

resources that they had to prepare these groups for college in the form of advanced-placement classes, teaching, and family expectations.

All of this is to say that low-income college students are more likely to experience delayed graduation (150-200%) than middle- and upper-class students due to various economic and social reasons, including anxiety, stress, and relational and family concerns. Some studies link academic preparedness (e.g., SAT scores, high school GPA, class rank) to persistence (Allen, 1999) and higher student grade point averages (Guiffrida et al., 2011). Other researchers argue that a large proportion of low-income college students do not possess the capital (e.g., academic, cultural, human, social, political), readiness, and emotional support (e.g., parental involvement) to complete higher education (ACT Center for Equity in Learning, 2018; Bettinger et al., 2019; Hamilton, Roksa, & Nielsen, 2018). Because low-income students often experience lower levels of both social and intellectual self-confidence, it is imperative to help them connect to their academic study. Unfortunately, anxieties or financial and time constraints often keep them from enjoying these opportunities because they must work longer hours, overcome psychological distress, and deal with technology-related problems (e.g., broken laptops, no internet) on-campus (Gonzales, Calarco, & Lynch, 2018; Goldrick-Rab et al., 2016). All of these characteristics are associated with lower rates of college completion and degree attainment.

To help decrease attrition, low-income students need personal counseling and support as they attempt to balance academic, financial and social pressures. Scholars and practitioners recommend that policymakers work collaboratively to improve practices and procedures for low-income populations. Several specific strategies include a structured freshman year experience, a

proactive¹⁰ and intrusive¹¹ approach to advising, personalized¹² faculty-student mentoring programs, as well as additional financial aid resources to support low-income students indirect cost (e.g., housing, food, transportation, textbooks) (Goldrick-Rab et al., 2016). IHEP (2018) recommends that, “Public flagship institutions should design admissions and financial aid policies that encourage historically underrepresented students to gain access and succeed at high levels” (p. 5). Given these points, it is critical that institutions of higher education make improvements in their policies and services to make significantly marked gains in student success. Successful institutions are restructuring admission processes, improving financial aid policies, expanding grant aid, and building student success courses or centers for specialized populations (Kimbark, Peters, & Richardson, 2016; Nguyen, Kramer, & Evans, 2019).

First-Generation College Students

Over the past few decades, the number of first-generation students entering and completing higher education has been growing rapidly. First-generation students are identified as those whose parents did not attend college or receive a 4-year college degree. They are the first in their family to pursue postsecondary education. While there have been a variety of definitions used in the past, practice appears to be consolidating on the one that bases first generation status on neither parent having a bachelor’s or higher degree (Toutkoushian et al., 2018; Toutkoushian et al., 2019).

¹⁰ Proactive “takes early, preventative action to address students’ needs in an anticipatory fashion – before they eventuate in problems that require reactive (after-the-fact intervention)” (Cuseo, 2019).

¹¹ Intrusive is defined as “rather than leaving students to their own devices to seek out needed support, the program initiates support by reaching out to students – actively bringing it to them – as opposed to passively offering it for them” (Cuseo, 2019).

¹² Personalized is defined as “the program ability to deliver customized person-to-person support that meets the distinctive needs of the individual student and the special needs of the student’s subpopulation (low-income, students of color, transfer)” (Cuseo, 2019).

Past research has consistently shown that first-generation college students have characteristics associated with lower rates of college enrollment and graduation, such as being more likely to come from families with low household incomes, more likely to work 15-20 hours a week, and lack family understanding of college environment and need for engagement (Atherton, 2014; Holland, 2010). In addition, first-generation college students are less likely to achieve their original educational aspirations than their peers from college-educated families (McCarron & Inkelas, 2006). For example, Cataldi, Bennett, and Chen (2018) found that among high school sophomores from 2002, those whose parents had college experience short of a bachelor's degree or whose parents did not have college experience at all were 10 to 20 percentage points less likely to enroll in college within 10 years than their peers with a parent with a bachelor's degree; and similarly less likely to enroll in their high school graduation year. Using three federal surveys conducted under the auspices of the National Center for Education Statistics: the Education Longitudinal Study of 2002 (ELS:2002), the 2004/09 Beginning Postsecondary Students Longitudinal Study (BPS:04/09), and the 2008/12 Baccalaureate and Beyond Longitudinal Study (B&B:08/12), Cataldi, Bennett, and Chen (2018) found that high school sophomores in 2002 whose parents had no college experience were half as likely to attend a 4-year college as their peers with a parent with a bachelor's degree (33% and 68%, respectively). Factors that influence the retention and success of first-generation students include poor management skills, lower self-esteem, or inadequate social and emotional skills needed to get along with peers from a diverse student body (Davis, 2010). In addition, first-generation college students are not skilled at selecting the courses that are appropriate to their skill and preparation, yet they cannot rely on their families for guidance (Aspelmeier et al., 2012). Although there have been numerous efforts to improve the completion rates of this population at

the institutional level, on-time completion and graduation remains a significant challenge for this group (NCES, 2017).

The following section provides a synthesis of the factors that affect first-generation college students experience on campus and their persistence and progression in higher education, with the focus on college student experiences and their effect on persistence and educational success. For the purpose of this review, the study will follow the Indiana University definition of first-generation college students which is defined as neither parent has a bachelor's degree but either or both might have some college experience.

Factors that Influence the Academic Outcomes of First-Generation Students

Researchers have attributed the significant differences between first-generation and continuing-generation students' academic performance to several academic, financial, social, and cultural factors including, familial and peer support, academic planning, social isolation, and work obligations (Gibbons, Rhinehart, & Hardin, 2019). Most first-generation students have to work part-time or full-time during college (Pratt et al., 2019). For example, Chen and Carroll (2005) analyzed college transcripts of first-generation students longitudinally using data from the Postsecondary Education Transcript Study (PETS) and found that most of these students have children of their own and work full-time outside of college which are both associated with dropping out. The authors suggest that first-generation students differ from continuing-generation students on major fields of study chosen, amount of coursework completed, and the types of courses taken during college. The authors found significant differences in graduation between students whose parents never attended college, attended college but did not graduate, and graduated with a bachelor's degree. In a related study, the NCES (2017) compared background, educational characteristics, plans, enrollments and completion patterns of first-

generation college students to those of continuing-generation students. Using the Education Longitudinal Study of 2002 (ELS:2002), the study found that about 20% of first-generation college students obtained a 4-year degree 10 years after their sophomore year of high school, compared to 42% of continuing-generation students. The report concluded that 54% of first-time, full-time students left college without a degree because they couldn't afford to continue, compared to 45% of continuing-generation students. In other words, most prior research on first-generation college students has found that these groups are less likely than their continuing-generation peers to persist and graduate from college. First-generation college students lack access to forms of human, academic, and cultural capital useful on campus to understand the maze of developmental courses¹³ that do not lead to a degree (Walpole, 2003). Family/work obligations, college knowledge, and financial resources are associated with the academic performance of first-generation students, because parents often encourage their children to drop out when academic challenges arise or there is lack of progress (Pratt et al., 2019). Taken together, the past research makes clear that generation status, socioeconomic status, and underrepresented minority status are inextricably intertwined in relation to college completion and timely graduation.

Current efforts to promote equitable opportunities among first-generation students have emphasized the importance of active engagement in college that reflects students' sense of belong at an institution and ultimately graduation (Strayhorn, 2012). These efforts are shaped by student engagement theories (Kuh et al., 2008). The challenge, however, is that first-generation students experience lower documented levels of engagement than their peers whose parents have

¹³ Many low-income, first-generation students have deficiencies in math or English skills that require them to take developmental (or remedial) classes to prepare them for college-level courses. Low-income, first-generation students are much more likely to place into developmental courses. Those who enroll in remedial courses persist at much lower rates than their peers (Boatman & Long, 2018).

completed college because they do not have relatives and friends who can help ease their natural anxiety about starting college or show them the ropes of a new campus social environment (Kuh et al., 2007). For example, some research suggests that first-generation students are less likely to participate in high impact practices and co-curricular activities, such as internships, learning communities, study abroad, capstone courses, and research with faculty members because they are more likely to work full-time while in college than their peers (Kuh et al., 2010; Pascarella et al., 2004; Whatley & Clayton, 2020). Of low-income, first-generation freshmen, 46% report that there is a “very good chance” that they will “work full-time while in college,” compared to 25% of their peers (Stolzenberg et al., 2019). These lower documented levels of engagement suggest that first-generation students face numerous difficulties on campus because their overall academic expectations or commitments that are not aligned with their existing skills and knowledge (Rowan-Kenyon, Martinez-Aleman, & Savitz-Romer, 2018). These stressors or non-cognitive factors can affect their academic and career goals because they are afraid to seek assistance in college, leaving them isolated and increasingly vulnerable (Pascarella et al., 2004).

For example, Engle and Tinto (2008) found that first-generation college students achieve lower first-semester GPAs than continuing-generation students and are less likely to earn a bachelor’s degree, but more likely to earn an associate’s degrees. Using three datasets from the U.S. Department of Education’s NCES, Engle and Tinto (2008) provided evidence that low-income, first-generation students who started in public, 4-year institutions were three times more likely to leave after the first year compared to their most advantaged peers, 12% to 4% respectively. When looking at completion within six-years of initial enrollment, low-income, first-generation students earned a bachelor’s degrees 30% lower at public 4-year institutions than for students who were neither low-income nor first-generation. The authors recommend that

institutions must provide a wide range of academic support programs – from mentoring programs to learning and tutorial centers to supplemental instruction to learning communities – to ensure their success on campus. First-generation students need encouragement to develop behaviors and strategies, like consistent attendance and goal setting, and help connecting to resources when facing obstacles. In other words, colleges and universities must provide first-generation students opportunities to acquire new forms of capital and financial literacy that positively affects their academic persistence and progression.

Gaps in the Literature

While there has been a range of studies as noted above that describe the differences in college completion by first-generation and family income, there are still some significant gaps in our understanding as to what factors have the greatest impact for what types of students. The existing research on low-income, first-generation college students has often relied on single-institution data with small numbers of students of color and students from low-income backgrounds (Toutkoushian et al., 2019). Another area that has not received sufficient research attention is the impact and value of college promise programs in promoting success. College promise programs, described in the following section, can support low-income, first-generation students by reducing the levels of financial stress and obligation they face upon enrollment. Do college promise programs enable low-income students to transition into and succeed in college? Do college promise programs assist with persistence-to-graduation, in particular, those that have holistic student support services¹⁴ like the IUB Twenty-First Century Scholars Program? While there are many questions still lingering, Complete College America (CCA) and Achieving the

¹⁴ Holistic student support services are defined as “comprehensive support that focuses on the student as a whole person and addresses both academic and non-academic issues that impact student persistence, learning and development” (Cuseo, 2019).

Dream have launched several new initiatives and services (e.g., *15 to Finish*, Finish Line Game) that may lead to increased college completion and graduation rates. However, such implementation requires evidence-based¹⁵ research to understand the policy effects of these initiatives or services on low-income, first-generation students' academic success.

As already noted, there are just a few empirical studies that have examined the academic outcomes of low-income, first-generation students who receive a college promise scholarship (Toutkoushian et al., 2015; Gurantz, 2020). This study will expand on the current research summarized in this section by examining local and state governmental efforts to improve the academic outcomes of low-income, first-generation students through a college promise program, the Indiana Twenty-First Century Scholars Program. While this dissertation does not explore the effects of student support services¹⁶ or departmental characteristics on the success of promise program recipients, such research can provide useful insight into the potential for college promise programs to effectively mediate student success for low-income, first-generation students (Ashcraft et al., 2017; Jarquin et al., 2019). As many campuses begin to develop innovative ways to improve college retention and completion rates of low-income, first-generation students, from providing faculty-student mentoring programs to utilizing technology and social media (Rowan-Kenyon, Martinez-Aleman, & Savitz-Romer, 2018), new formal research is needed to understand how college promise programs can be used to improve college completion and graduation rates. Researchers and practitioners should consider the demographic factors and institutional characteristics, practices, and policies when conducting experimental or

¹⁵ Evidence-based refers to any concept or strategy that is derived from or informed by objective evidence, most commonly, educational research or metrics of school, teacher, and student performance.

¹⁶ Effective student support services have five common features: (a) structured first-year experience, (b) academic support from developmental and popular first-year courses, (c) extensive student service contacts, (d) targeted participation incentives, and (e) dedicated directors and staff (Muraskin, 1997).

quasi-experimental research designs of historically underserved populations (Perna & Smith, 2020; Swanson, Watson, & Ritter, 2020).

Summary

The synthesis of the literature suggests a statistically significant association between three student characteristics – low-income, first-generation, and underrepresented minority status - and student college-related outcomes. Specifically, the cluster of related characteristics can relate to the concept of a student’s *habitus*, which, in the student success context, refers to the amount of support students receive from their parents to pursue higher education. Although there are several other determinants that can influence college completion which are not discussed, including student engagement (e.g., hours studying, hours working, engagement with faculty) and the marginalization in the curriculum (Coates & McCormick, 2014; Perna & Odle, 2020), this review suggests that students with these inter-related characteristics face significant barriers to college completion. As noted by then President of the United States Barack Obama (U.S. Office of the Press Secretary, 2014), “Many first-generation students lack the support and resources to navigate college – from test taking to financial aid – and they end up choosing a college that is not a good fit for them or no college at all” (p. 14). For this reason, colleges and universities can implement completion policies and initiatives to provide low-income, first-generation college students the support necessary for their engagement and success on campus.

15 to Finish Initiatives

In recent years, the college completion agenda has been bolstered by national calls from policymakers and foundations alike to raise the overall rate and timeliness of degree attainment (Lumina Foundation, 2018; U.S. Office of the Press Secretary, 2009). The *15 to Finish* initiative, supported by the Complete College America (CCA), a national alliance dedicated to improving

college completion rates, encourages students to enroll in 15 credits per semester (or, including summer terms, 30 credits per year) with the long-term goal of reducing student loan debt¹⁷. It seeks to change the fact that the majority of college students do not register for at least 15 credits per semester (Dannenberg & Mugglestone, 2017), the minimum course load that would enable them to earn a baccalaureate degree in 4 years. Yet, there are debates among policymakers and scholars alike on whether college completion agendas and initiatives such as the *15 to Finish* initiative or other similar initiative such as Temple University “Fly in 4” campaign can increase retention and graduation rates for colleges and universities (Goldrick-Rab, 2016). Common criticisms include: the initiative benefits affluent, privileged students who enter higher education with higher levels of academic and social capital; very few institutions provide holistic student support services for low-income, first-generation students, especially those within college promise programs; state governments do not collect enough information necessary to properly determine if students completed 30-credit hour per academic year; and, in some case, the implementation of the *15 to Finish* initiatives is too burdensome for institutions, especially those in community colleges and for-profit universities (Fain, 2016; Kolodner, 2017).

In general, the *15 to Finish* initiative if designed appropriately, ensures that institutions of higher education graduate a significant proportion of their disadvantaged students on-time. Recent research suggests that the vast majority of college students aren’t taking the credits needed to graduate on time within 4-years of initial enrollment (Dannenberg & Mugglestone, 2017). Many first-time, full-time students need more than 4 years to complete a traditional 120

¹⁷ Students from the Class of 2018 with a bachelor’s degree averaged about \$29,200 in student loan debt, a record in the United States and a 2% increase from the Class of 2017 (\$28,650) (TICAS, 2019). The debt loads vary heavily by region. Borrowers who attended college in the Northeast had the highest average debt, whereas those in the West graduated with the lowest. Black students and those from low-income backgrounds were more likely to have debt at graduation (TICAS, 2019).

credits, 4-year major program because they may need to change majors or not successfully completed the classes within their field of study the first-time, they take them. This issue has led many academic advisors to take a longer and more integrated view of the student experience beyond the semester-by-semester building process. Today, the CCA (2018) reports that more than 450 higher education institutions across the United States have implemented a *15 to Finish* initiative. However, the increasing number of colleges and universities adopting the *15 to Finish* initiative has created some concern that not all students would be able to maintain this pace of completion because of family duties, financial limitations, work obligations or other realities that preclude them from regularly taking that many credits (Adelman, 2006; Attewell, Heil, & Reisel, 2012). While some research has shown that pushing for 15 credits a semester benefit most students, resulting in more completing on time (Community College Research Center (CCRC), 2016; Klempin, 2014; University of Hawaii's Institutional Research Office, 2013), other studies suggest that students taking 15 credits while working part-time do not graduate at higher rates compared with students taking 12 credits (Monaghan & Attewell, 2015).

The University of Hawaii's Institutional Research Office (2013) found that after just one year of implementation of the *15 to Finish* initiative, the rate of incoming students at the flagship Manoa campus enrolling for 15 credits per semester jumped from 38% to 64%. Similarly, the staff of the Community College Research Center (CCRC) (2016) provided evidence of substantial positive outcomes for students who take 15 credits their first semester, including a 6.4 percentage point increase in degree completion. Using student-level data from the Tennessee Board of Regents, the study found significant improvements in credit accumulation and degree completion rates at both 2- and 4-year colleges. The results, after controlling for student input characteristics, suggest there are savings to learners in the form of paying less tuition as well as

an increase in institutional revenues through increased student persistence. This study mirrors Scott-Clayton's (2011) earlier study which found that students who complete 30 credits per academic year through the West Virginia Promise Program (WVPP) increased their 4-year completion rates between 5.8 and 10 percentage points and decreased time-to-degree. In a related study, Klempin (2014) examined the academic outcomes from several 15-credit policies at 2-year institutions, finding a positive impact for less academically prepared students in terms of student credit completion, GPA, and progression. However, the report also highlights several key challenges for low-income, first-generation students to maintain this pace including their ability to balance enrollment intensity and academic performance, as well as institutions capacity to provide holistic student support services for these special populations. In the end, Klempin (2014) recommends that community colleges engage in careful planning and consideration before deciding on and adopting a 15-credit approach. Because not all students will be able to take 15 credits per semester, it is essential for institutions of higher education to provide alternatives that keep them on track to degree completion.

Nevertheless, a full assessment of the current course loads and outcomes will be critical to better understanding the potential impact and possible benefits of the *15 to Finish* initiative (Stout, 2013).

Rates of Credit Hour Completion and Graduation Rates in Higher Education

Recent initiatives by many institutions focus on encouraging low-income, first-generation students to enroll in 15 credits per semester. These programs with credit hour requirements or required academic performance metrics are believed to be effective to increase credit hour completion and graduation rates. However, some researchers and practitioners argue that the *15 to Finish* initiative is most likely to succeed when well-informed faculty and staff advisors who

counsel students cultivate early academic momentum (Adelman, 2006; Attewell & Monaghan, 2016). Academic momentum is measured by the credit load and patterns of enrollment during the first year of college, such as enrolling in summer courses, completing a significant amount of credits, and retaining full-time status, all of which are related to positive educational outcomes (Attewell et al., 2012). Several studies have explored the positive and negative effects of academic momentum (e.g., intensity of credit load, continuity of enrollment) on college progression and graduation at both 2- and 4-year institutions (Castleman, Long, & Mabel, 2018; Crosta, 2014; EAB, 2017; Wang, 2015).

For example, a policy report by EAB (2017) suggests that low-income students who average 15 or more credits across their first year end the year with higher GPAs and higher retention rates than their full-time peers who take fewer credits at 4-year institutions. Using academic record data of nearly 1.3 million freshmen from 137 colleges and universities, EAB (2017) found that Federal Pell Grant recipients who took 15 or more credits were 7 percentage points more likely to persist and had an end-of-year GPA that was 0.12 points higher than non-Pell Grant recipient peers who averaged only 12-14 credits per term in the first year. Their findings closely resemble past research conducted by Attewell and Monaghan (2016) who found that taking 15-credits or more per semester at either a 2-year or 4-year institution consistently increases retention and completion for traditionally affluent students. The study, which followed a nationally-representative sample of first year students entering postsecondary education in the 2003-2004 academic year, suggest that students who completed 15-credits or more in their first semester had a higher probability of achieving a baccalaureate degree within 4-years than similar students who stayed below this threshold. The problem of this study, however, is that the authors did not take into consideration the selection effect, the type of course students completed, as well

as students overall major status, as past research suggest that students often switch majors two or three times and complete remedial courses that do not count toward their degree (Boatman & Long, 2017). Attewell and Monaghan (2016) cautioned in the end that such a model or approach works for some underrepresented college students but not all groups such as those who work longer hours during college (Soria et al., 2014), which may lead to their dropout (Mendoza, 2012). A follow up report by the research firm Postsecondary Analytics (2017) revealed that racial/ethnic minority students in Indiana who complete 30 credits or more had a greater positive impact in terms of average fall credit hours attempted and earned than non-racial/ethnic minority students. However, like Attewell and Monaghan (2016), their report did not take in to account the on-time graduation rate of Indiana TFCS recipients, which only funds up to 4-years of tuition scholarship. And, while past studies suggest that students taking 15 credits during their first semester or first year are more likely to persist and graduate on-time, these publications often only examine traditional students (i.e., students who enroll immediately after high school), or students who receive merit-based financial aid (i.e., mostly White affluent students) and do not examine whether credit accumulation has an independent causal effect on academic success for need-based scholarship programs (i.e., primarily low-income underserved students) such as the Indiana TFCS Program (Attewell & Monaghan, 2016; Erwin & Binder, 2020).

Indeed, there is a dearth in the literature that has used longitudinal data to track student academic progress over the six-year period (Adelman, 2006; Nguyen, Kramer, & Evans, 2019). Very limited research has provided evidence-based information on how policymakers and practitioners can design college promise programs where *15 to Finish* is consistently emphasized. Thus, new formal and informal research should examine the effects of need-based grants or college promise scholarships on the credit completion of a bachelor's degree, to what

extent the *15 to Finish* initiative has encouraged college promise program recipients to cultivate early academic momentum, and to what extent students accumulate (or lose) academic momentum early in college (Custer & Akaeze, 2019). Table 1 summarizes a few areas teacher-scholars and practitioners should consider prior to conducting research on the impact of the *15 to Finish* initiative.

Table 1

15 to Finish Initiative: Background Characteristics and Environment Influences on Student Success

Background Characteristics	External Environment Influences	Internal Environment Influences
Age	Finances	Enrollment Status (Full or Part-Time)
High School GPA	Work Responsibilities	Peer Mentor Support
Generation Status	Significant Life Events	Faculty/Advisor Support
Geography	Community Responsibilities	Financial Aid (Federal Pell Grant Status)
Parental Education	Mental Health and Wellbeing	Cost of Tuition
Educational Goals	Hours of Employment	Flexible Course Offerings
Motivation	Family Responsibilities	Active and Relevant Learning
Marital Status	Commuter or Non-Commuter	Prior Learning Assessment
Children	Food Insecurity	Institutional Support
English Language Learner	Transportation	Institutional Type and Selectivity
SAT Score		

College Promise Programs

In the last decade, federal, state and institutional policymakers have placed greater emphasis on college promise programs¹⁸ or tuition-free degree programs as a national strategy to

¹⁸ College promise programs are defined as tuition free degree programs that cover student’s mandatory tuition and fees. It does not include room, board, textbooks, and other indirect costs from other sources (Perna & Leigh, 2018).

lower or eliminate the cost of tuition and fees and in doing so increase college degree completion and educational attainment levels among underrepresented groups (The Education Trust, 2018). College promise programs and debt free college proposals have been adopted at the local, regional, and state levels to promote equity in higher education opportunity and outcomes by providing either partial or full tuition scholarship for students to obtain a postsecondary degree in close proximity to the promise community (MDRC, 2019). A study by the Campaign for Free College Tuition (2020) claim that 77 percent of Americans want their state to provide free tuition at public colleges or universities to any academically qualified student. Whereas traditional financial aid programs (e.g., the Federal Pell Grant Program) award grants to students who demonstrate financial need or meet academic criteria, college promise programs target resources beyond existing state and federal aid to individuals who live in designated places, meet local- or state-defined eligibility criteria, and/or attend specific K–12 schools (Perna & Smith, 2020). Although there are a variety of promise program types (Millett et al., 2020; Perna & Leigh, 2018), for the purpose of this dissertation, I am focusing on a promise program that has the following four characteristics: (1) offers a scholarship for college enrollment and participation, (2) requires students to either attend a school in a specific district and/or reside within specific geographic boundaries for a set amount of time, (3) attempts to increase the degree attainment of its students, and (4) was developed either by the state government or local entity (county, city, school district, K-12 school) (Miller-Adams, 2015).

As of March 2020, a total of 420 college promise programs were active across 204 locations in 44 states offering from 1 to 4 years of funding (MDRC, 2020; Perna & Leigh, 2019). This total includes 16 statewide programs that have passed through legislation or executive

orders (see Appendix E). Figure 1 from Billings (2018a), presents a heat map for the number of promise programs across the continental United States:

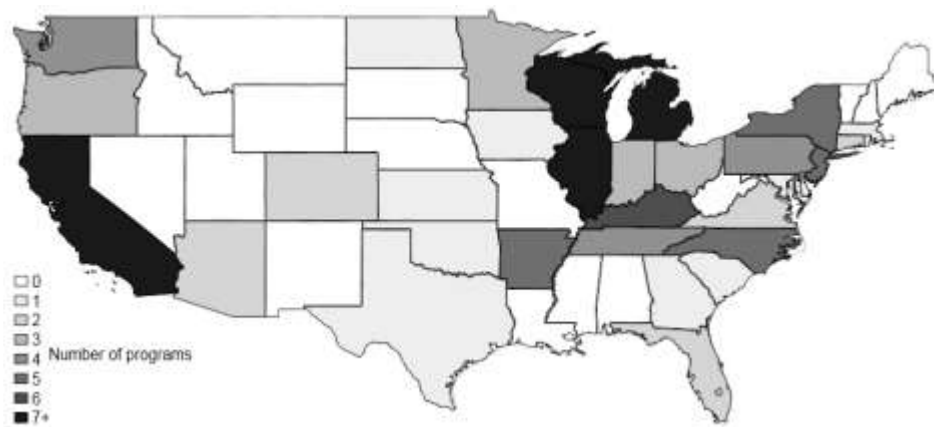


Figure 1. Heat map of college promise programs in the United States.

The states with the most college promise programs in quantity are California (30 programs), Michigan (19 programs), and Illinois (12 programs). There is also a significant concentration in the Midwest (Billings, 2018a). These states all share a common goal of improving K-12 attendance and graduation in public schools, enhancing academic performance in specific geographic boundaries, and increasing college access and completion rates of underrepresented groups (MDRC, 2019; Perna & Leigh, 2018). While the growth of tuition-free degree programs has expanded since the Great Economic Recession, educational policymakers and researchers know very little about their overall effectiveness in terms of design and structure (Hemanway, 2017; Millett et al., 2020; Perna & Smith, 2020). Further, some policy organizations have expressed concerns that college promise programs or debt free college proposals are not targeted for low-income families and are not designed or built for completion (Gross, Williams-Wyche, & Williams, 2019; The Education Trust, 2018; IHEP, 2018b; Whistle & Hiler, 2019).

For example, the launch of the Tennessee Promise in 2014, New York Excelsior Scholarship in 2017, California College Promise Grant in 2018, and New Mexico Opportunity

Scholarship in 2019 that eliminated tuition and fees for either the first 2 years or first 4-years have catalyzed several states to develop and create their own versions of a college promise program (i.e., policy diffusion) (Bell, 2020; Driscoll, 2019; Erwin & Binder, 2020; Nguyen, 2019). All four programs require students to live within a geographic boundary for a set number of years to obtain the scholarship. Yet the extent of these programs has been criticized by the Institute for Higher Education Policy (IHEP) (2018b) for their inability to meet unmet need of low-income, first-generation students. The IHEP (2018b) report stated, “These programs [Tennessee Promise and New York Excelsior Scholarship] do not support non-tuition college expenses, such as books or room and board, and their “last-dollar” design directs more funding toward students who do not qualify for need-based financial aid, such as the Federal Pell Grant” (p. 2). The Education Trust (2018) follow-up report added that some promise programs exclude low-income and first-generation students due to age, GPA, high school grades, prior college experience, and how many credits they take or earn. As noted by Tiffany Jones from The Education Trust (2018) report:

After decades of underinvestment at the state level, free college could be the next big thing in higher education. Free college, if designed thoughtfully, could be as pivotal to accessing a college education as the Federal Pell Grant or the GI Bill. Unfortunately, at this moment, too many states are racking up political support among upper- and middle-class voters while excluding students from low-income families in their plans (p. 8).

In other words, “The promise of a college degree or certificate is an empty one if newly accepted students don’t go on to complete their chosen credential” (Complete College America (CCA), 2018, p. 2).

Given these current issues, this section explores the variation in promise program designs, with special attention to the Indiana Twenty-First Century Scholarship (TFCS) Promise Program, one of the oldest and most well-known of the nation's promise programs (Millett et al., 2020). As promise scholarships continue to be created across the United States (see Appendix D), new formal and informal research should examine how these programs vary significantly in terms of funding, scope, and eligibility; and the context in which they are developed and implemented to ensure that requirements and policies are not disproportionately excluding low-income and first-generation students (Perna & Smith, 2020; Perna & Leigh, 2018).

Types of College Promise Programs

There is little consistent format among college promise programs, which vary by eligibility criteria, financial generosity, and the types of eligible postsecondary institutions that recipients can attend (Perna & Smith, 2020). Perna and Leigh (2019) database of college promise programs suggest seven categories: (1) state need-based aid programs, (2) state merit-based aid programs, (3) four-year institution programs, (4) place-based programs, (5) last-dollar community college promises, (6) first-dollar community college programs, and (7) universal eligibility programs. Despite the many categories of promise programs, the two most common types are early-commitment and place-based promise programs (Baskerville & Fitzpatrick, 2017). These programs vary by criteria, such as residency, academic merit (e.g., GPA, SAT, AP courses), financial need, community service, school attendance, and evidence of good citizenship (Billings, 2018a). Early-commitment promise programs award scholarships based on continuous attendance and residency within a given middle and high school district while place-based promise programs, on the other hand, provide universal or near-universal access to financially support students who reside in a city or state. Both early-commitment and place-based promise

programs share similar features and objectives to increase the quality of the K-12 school districts, creating a college-educated labor, and attracting new businesses (Li & Gándara, 2020).

The key distinction between the two is based on the size of the geographic area that the promise program covers (Willard, Vasquez, & Lepe, 2019). If the scholarship is state-wide like the Indiana TFCS, then it is often called early-commitment. If the scholarship is locally focused within a specific city or school district like the Long Beach Promise or New Haven Promise, then it is often called place-based (Perna, Leigh, & Carroll, 2017). Given these points, one can argue that some early-commitment promise programs are aimed to prepare students early for college preparatory courses and activities, with the long-term goal of helping students leverage the use of existing resources within their institution. Like early-commitment, some place-based promise programs are designed to deepen the college-going culture in school districts by encouraging parents and students to discuss about college choice after K-12 education (Dynarski et al., 2018). Despite these small differences, most promise programs today are last-dollar merit-based programs (75%) at 2-year community colleges because they require fewer financial resources to sustain (Billings, 2018a, 2018b; Gurantz, 2020, Page et al., 2019). Even though research on last-dollar merit-based programs is growing (with the vast majority focusing on programs like the Kalamazoo Promise, Pittsburgh Promise, and the Georgia HOPE Scholarship (Bartik, Hershbein, & Lachowska, 2019; Billings, 2018a; Bozick et al., 2015; Erwin & Binder, 2020; Page et al., 2019), limited research has examined the significant impact of first-dollar promise programs and to what extent need-based, generous programs have a greater impact on college completion of low-income, first-generation students (Goldhaber et al., 2020; The Education Trust, 2019; Perna & Smith, 2020; Willard, Vasquez, & Lepe, 2019).

The difference between first-dollar or last-dollar scholarships is important because it determines how much aid the students receive from the promise program (Gross, Williams-Wyche, & Williams, 2019). Promise programs with first-dollar designs apply scholarship dollars to the tuition bill first, prior to any other federal and state grant aid. This design allows low-income, first-generation students to acquire additional money because they can use their promise scholarship dollars with federal and/or state grant aid to cover the cost of attendance. On the contrary, last-dollar designs means that aid from the promise program is applied after the Federal Pell Grant and state need-based aid. Middle and high-income students benefit more from last-dollar designs because they earn too much money to qualify for need-based aid and would normally be expected to pay more out of pocket based on federal needs analysis (Goldrick-Rab et al., 2016). Ultimately, last-dollar designs tend to subsidize middle- or high-income students that are not eligible for federal and/or state grant because they are eligible for promise scholarships. This issue tends to disadvantage low-income students because the more Federal Pell Grant they get, the less scholarship they receive from the promise program. While much research has focused on last-dollar place-based promise programs in the last few years, very few, if any have examined first dollar early-commitment promise programs (Goldhaber et al., 2020; Odle et al., 2019; Perna & Smith, 2020).

Early-commitment college promise programs. Since the 1990s, numerous studies have been conducted on the rise and the fall of early-commitment college promise programs across the United States (Gross et al., 2015; Hossler et al., 2009; St. John, 2010; Toutkoushian et al., 2015). As of today, there are seven states (Indiana, Kentucky, Minnesota, New York, Oklahoma, Oregon, and Tennessee) with statewide early commitment college promise programs. A few notable examples are the Indiana Twenty-First Century Scholars (TFCS) Program, the Oklahoma

Promise Program, the Washington College Bound Scholarship Program, and the Give Something Back Foundation Need-Based College Access Promise Program (Goldhaber et al., 2020). Early-commitment promise programs typically provide first-dollar (i.e., scholarship applies first before any other gift aid or self-help aid) full-tuition scholarships to low-income, high-need students (Mishory, 2018b). These programs are primarily financed by the state government in which students must sign a “Scholar pledge” in middle school and are required to complete a series of college prep curriculum in high school (e.g., Indiana 21st Century Scholars Success Program) to receive the full-tuition scholarship. Ultimately, the goal of early-commitment promise programs is to empower students to successfully navigate the college application process and to attend college after completing high school regardless of their financial background or socio-economic status (SES) (Perna, 2009).

In terms of their design, early-commitment college promise programs differ on various characteristics, including college prep curriculum requirements, income eligibility requirements, student support services, and funding sources (Goldhaber et al., 2020). The four commonly required criteria in early-commitment programs are: 1) the scholarship program is limited to students residing in one state, 2) provides funding for at least one higher education institution (first-dollar or last-dollar), 3) require students to sign a pledge in either middle school or high school to receive the tuition-free scholarship in college, and 4) funded by the state government (Mishory, 2018a). However, these criteria are not enough to ensure the success of the programs and that other defining features should include clear goals, strong support services and evidence-based improvement (Li & Gándara, 2020). Several common features of early-commitment promise programs still exist that may undermine equity and inclusion (Perna & Leigh, 2018). Table 2 summarizes the common issues and the literature reviewed throughout this section.

Table 2

Common Features of Early-Commitment Promise Programs that Undermine Equity

Feature	Problem
30 credit hour completion requirements	This requirement harms students who are not academically prepared for college.
GPA and ACT/SAT requirements	Having GPA or ACT/SAT requirements makes the program function more like merit aid, which disproportionately benefits white and wealthy students.
Restricted to full-time students	Excluding part-time students harms low-income students who must work or have caregiving responsibilities
Restricted to recent high school graduates	This excludes returning and older adult students, and those who have to delay college enrollment.
Income eligibility	This excludes students who are middle-income, or those who are identified as lower-middle income (Goldrick-Rab et al., 2016).

Nationally, Perna and Leigh (2019) found only 36 early-commitment college promise programs out of the 420 active promise programs (Table 3), with some being discontinued by the state governments (Harnisch, 2009). For example, the Wisconsin Early Promise Program closed in 2011 due to state budget cuts (Anderson et al, 2020; Goldrick-Rab et al., 2015). Furthermore, some early-commitment scholarship programs along with four-year institution programs (e.g., University of Michigan Go Blue Guaranteed, University of North Carolina at Chapel Hill’s Blue Sky Scholars Program, University of Wisconsin-Madison Bucky’s Tuition Promise, University of Southern California’s Free College Plan), do not provide holistic student support services on-campus (St. John et al., 2008). With over 400 currently active state grant programs across the country, it seems unlikely that a common language is possible to categorize these programs (Custer & Akaeze, 2019).

Table 3

List of Early-Commitment College Promise Programs in the United States

Indiana 21 st Century Scholars	Arkadelphia Promise	Baldwin Promise
Bay Commitment First Generation Scholarship	Beacon of Hope	Challenge Scholars
Cleveland County Promise	College Bound Scholarship – Washington	College Crusade of Rhode Island
College Opportunity Fund (COF)	DC College Access Program	Detroit College Promise
Detroit College Promise	Eldorado Promise	Galesburg Promise
Hammond College Bound Scholarship Program	Hartford Promise	Hazel Park Promise
Jackson Legacy	La Crosse Promise	Leopard Challenge
Mid-North Promise Program	New Haven Promise	Northport Promise
Oklahoma Tuition Aid Grant	Oklahoma’s Promise	Philadelphia Education Fund
Pittsburgh Promise	Pontiac Promise Zone	Richmond Promise
Rusk TJC Citizens Promise	Saginaw Promise	Say Yes Buffalo
Say Yes Guilford	Say Yes Syracuse	School Counts! Madisonville

SOURCE: Perna and Leigh (2018a)

Indiana Twenty-First Century Scholarship Program

The Indiana Twenty-First Century Scholarship (TFCS) Program is an early-commitment, state-sponsored college promise program funded by the State of Indiana and managed by the Indiana Commission for Higher Education (ICHE), offering income-eligible Hoosier students up to 4 years of 100% tuition at an eligible Indiana 2-year or 4-year public higher education institution. It also allows the scholarship to be used to cover 50% of tuition at approved private or proprietary institutions. The purpose of the Indiana TFCS Program is to encourage low-income students to plan for and attend postsecondary education. All low-income 7th and 8th graders are eligible to enroll provided they meet the income threshold (i.e., Free- and Reduced-Lunch Program – 185% poverty level). A student’s eligibility is determined by their annual household income. For households of two, the maximum qualifying income is \$30,044. For each additional person in the household, the minimum qualifying income threshold increases by \$7,733 (Chan, 2018).

Students who qualify based on income are then awarded the scholarship upon initial enrollment at an eligible postsecondary institution. To receive the scholarship, Scholars must complete a series of activities through the Indiana Scholar Success Program designed to prepare them for college success. These activities include completing a high school graduation plan, filing for financial aid, and visiting a college campus. Scholars must also complete the state's college preparatory curriculum (Core 40) in high school with a cumulative GPA of 2.5 or higher on a 4.00 scale. Furthermore, Scholars must file a Free Application for Federal Student Aid (FAFSA) by April 15 as a high school senior and each year thereafter until graduation from college. Scholars who fail to meet the income requirements in their senior year will be eligible for a one-time scholarship of up to \$2,500.

While in college, Scholars must enroll as a full-time student within one year of high school graduation and maintain Satisfactory Academic Progress (SAP)¹⁹ standards established by the institution. In addition, Scholars must complete 30 credit hours each academic year (since 2013), maintain Indiana residency, and be a good citizen (i.e., comply with all legal and university conduct codes) during their 4-years in college. Table 4 provides some overall general statistics related to the Indiana TFCS Program and recipients across the state of Indiana during the 2016-17 academic year and Table 5 compares the two target campuses for this study, Indiana University Bloomington (IUB) and Indiana University-Purdue University, Indianapolis (IUPUI) across a range of relevant institutional, student and financial aid characteristics. IUB currently enrolls the most TFCS recipients in the State of Indiana, with IUPUI ranked second in 2018-19 (see Appendix A).

¹⁹ By federal law, all postsecondary institutions must establish reasonable satisfactory academic progress (SAP). Requirements for financial aid eligibility in order to maintain Title IV status, which allows these students to obtain federal aid.

Table 4

2017-18 FAFSA Overview: Indiana Twenty-First Century Scholars Program

Dollars Awarded	\$163,264,152
Recipients	21,184
% First-generation students	45%
% Financially Dependent	93%
% Female	63%
% Single	99%
% Federal Pell Grant Eligible	78%
% Federal Pell Grant Recipients	37%

Source: ICHE (2019)

Table 5

2016-17 Comparing Indiana University Bloomington (IUB) and Indiana University-Purdue University, Indianapolis (IUPUI)

	IUB	IUPUI
Institutional type	4-year, large, primarily residential, more selective, flagship research university	4-year, large, primarily nonresidential, moderately selective, urban research university
Average debt of graduates	\$28,792	\$29,065
Percent of graduates w/any debt	45%	70%
Percent of graduates w/private loan debt	10%	13%
Percent of graduates w/institutional loan debt	0%	1%
Nonfederal debt, percent of total debt of graduates	29%	12%
Bachelor's degree recipients	6,414	2,435
Undergraduate enrollment	33,237	21,748
TFCS recipients	2,860	2,415
TFCS average award	\$9,939	\$8,370
In-state tuition and fees	\$10,388	\$9,205
Total cost of attendance	\$24,809	\$22,257
Federal Pell Grant recipients	1,441	1,065
Federal Pell Grant graduation rate	66%	40%
Percent of institutional grants that are need-based	43%	60%

SOURCES: Indiana University Center for Postsecondary Research (n.d.); The Institute for College Access & Success (TICAS) (2018); Third Way (2018).

In summary, the current literature on college promise programs has shown that policymakers and legislators are developing early-commitment promise scholarships, and more broadly, tuition-degree promise scholarships because they desire to enhance economic opportunity and to promote a college-going culture in their local or regional communities. Individuals and organizations within communities may also be motivated to create promise programs because they are competing with neighboring cities for scarce resources, such as middle-class families, educated labor, and new businesses (Berry, 1994; Berry & Berry, 1990, 2007; Walker, 1969). The literature suggests that early-commitment college promise programs have positive effects on K-12 academic performance, postsecondary outcomes, and community development (Billings, 2018a; Bartik et al., 2019). Early-commitment promise programs with generous benefits (first-dollar, need-based) and with greater flexibility (i.e., the scholarship can be used at a wide range of institutions) typically have larger, positive effects on students' educational outcomes, compared to programs with targeted criteria and limited benefits (Billings, 2018a; Gross, Williams-Wyche, & Williams, 2019; Long, 2008). Indeed, as institutional aid support declines and tuition rates continue to rise, early-commitment college promise programs provide significant benefits to low and middle-income students and families (Custer & Akaeze, 2019). However, it is possible that the long-term benefits of free college tuition benefit multiple constituencies including K-12 principals, university presidents, governors, parents, policymakers, and students.

Accordingly, to fully understand the impact of early-commitment promise scholarships, more work needs to be conducted on evaluating other promise programs, especially first-dollar scholarships targeted for low-income, first-generation students (Custer & Akaeze, 2019; Perna & Smith, 2020; Miller-Adams, 2015). It is imperative that scholar-practitioners and policy

advocates understand the full impacts of these programs on a range of outcomes, from development to achievement to completion (Nguyen, Kramer, & Evans, 2019). It is also significant for scholars of education policy and practitioners to examine how policies adopted within early-commitment college promise programs may affect their effectiveness and inclusiveness (Gross, Williams-Wyche, & Williams, 2019).

Hence, this study examines how the Indiana TFCS, first-dollar, early commitment college promise scholarship support college persistence and completion of low-income, first-generation students, and whether a policy introduced to further promote on-time completion was successful in doing so. Specifically, this dissertation will use a difference-in-differences statistical design to compare Indiana TFCS recipients and Indiana non-TFCS Pell recipients (i.e., Indiana residents who were identified as receiving a Federal Pell Grant in their first year of enrollment but did not receive the TFCS) from Indiana University Bloomington (IUB) and Indiana University-Purdue University, Indianapolis (IUPUI) in the pre- and post-policy cohorts of the IC-21-12-6-7 (i.e., *15 to Finish* initiative). The goal of this study is to explore the treatment effects of the IC-21-12-6-7 in determining whether a higher proportion of TFCS recipients graduate with their degrees on-time, compared to non-TFCS Pell recipients since the statewide policy adoption in Fall 2013. The study design and methodology of this approach is discussed in Chapter 3.

CHAPTER 3: STUDY DESIGN AND RESEARCH METHODOLOGY

The purpose of this dissertation is to examine the effects of the 30-credit hour annual completion policy on college progression and completion among TFCS recipients and non-TFCS Pell recipients at Indiana University Bloomington (IUB) and Indiana University-Purdue University, Indianapolis (IUPUI). This chapter outlines the empirical approach used and the research questions that guide this dissertation. Next, I review the source of data used to address the research questions, followed by a review of the quasi-experimental design, difference-in-differences (DiD) testing. The chapter ends with a discussion of the key robustness tests employed in the study and some limitations of both the data and empirical strategy.

Research Questions

Below are the two key exploratory research questions for this study:

1. To what extent did the 30-credit hour annual completion policy (*15 to Finish*) achieve its intended effects: increasing credit accumulation, improving student progress and increasing graduation rates?
2. To what extent are any of the identified policy effects moderated by demographic factors (race, gender, generation) and pre-college characteristics (high school GPA, SAT Score), that is, to what extent does the policy appear to have differential effects for various types of students?

Sources of Data

The study employs secondary data obtained from Indiana University's University Institutional Research and Reporting (UIRR). UIRR, a unit within the Office of the Executive Vice President for University Academic Affairs (OEVPAAA), "completes myriad federal and state compliance reports and produces official university reports on admissions, enrollment,

retention, graduation rates, degree completions, and financial aid for Indiana University and all its campuses.” UIRR provides research support and policy recommendations to campus administrators, staff, and faculty with timely and relevant research, data analysis, data interpretation, and information to improve institutional effectiveness and performance, that will help guide decision-making goals related to student success, recruitment, and retention. Table 6 provides the summary of the IU UIRR-derived data source.

Table 6

Indiana University’s University Institutional Research and Reporting (UIRR): Definition of Data Source Variables

Variable Name	Description
CreditsY1	Cumulative IU credits completed, first year at IU
GPAY1	Cumulative GPA at after first year of classes
CreditsY2	Cumulative IU credits complete, through second year at IU
GradStat4	Binary indicator of whether the student receive a degree in 4 years.
EnrGradStat6	Binary indicator of whether the student was still enrolled or received a degree after 6 years
INST_CD	Institution code IUBLA and IUINA
Pell	Whether or not student has the Federal Pell Grant (NOTE: all Non-TFCS Pell do, but not all TFCS). 0 = No; 1 = Yes
Award Status	0 = Non-TFCS Pell; 1 = TFCS
Policy	0 = Pre-Policy (2011-12); 1=Policy (2013-14)
TermCode	IU Student Information System (SIS) - 4118 = Fall 2011, 4128 = Fall 2012, 4138 = Fall 2013, 4148 = Fall 2014
C21Amt	Amount of TFCS award in first year
PellAmt	Amount of Federal Pell Grant award in first year
Gender	1 = Male; 2= Female
RaceEthCode	1 = White/Caucasian; 2 = Black/African American; 3 = Hispanic/Latinx; 4 = Asian American; 5 = American Indian; 6 = Non-Resident/Alien; 7 = Other/Unknown
FirstGen	0 = Continuing-Generation; 1 = First-Generation

HSGPA	Converted to 4.00 scale
SATACT	SAT (or converted ACT) given in SAT scale

Source: Indiana University’s University Institutional Research and Reporting (UIRR) (2019).

Study Participants

This study uses students as the unit of analysis and conducts separate analyses of students for two institutions: Indiana University Bloomington (IUB) and Indiana University-Purdue University, Indianapolis (IUPUI). The primary rationale for selecting IUB and IUPUI as for this study was to compare findings at a “residential/more selective” institution and a “nonresidential/not as selective” campus, as they both serve different types of students in Indiana. The two groups of students in this study are Indiana Twenty-First Century Scholarship (TFCS) recipients and non-TFCS Pell recipients (i.e., Indiana residents who received Federal Pell Grants but not TFCS).

The non-TFCS Pell recipients include students who were unable to maintain Indiana TFCS eligibility because they did not complete the required steps in high school (i.e., Indiana Scholar Success Program), or perhaps they simply chose not to due to several internal and external factors (e.g., missed June 30th deadline to enroll in the TFCS Program before the end of 8th grade; complexity of filing the FAFSA application; inability to provide proof of residency status in the state of Indiana; DACA status; unaware of the Indiana TFCS Program due to a lack of awareness by high school counselors (mostly in rural towns)). The non-TFCS Pell recipient group might also include students who did not meet the Indiana TFCS eligibility income requirements when in high school, but whose families have since, and maybe only temporarily, have lower income to qualify for the Federal Pell Grant.

Data represent enrollments from the academic years 2011-12 through 2014-15. A total of 7,468 low-income students are in the UIRR-derived database at both IUB ($N = 4,265$) and IUPUI

($N = 3,577$). In terms of group membership, complete data were available for 2,155 first-time, full-time TFCS students enrolled at IUB and 1,791 enrolled at IUPUI. To select relevant comparison groups, TFCS students were first arrayed by policy status (entry year) and campus. Students with the same entry criteria (first-time, full-time, Indiana residents) who were not TFCS participants but were identified as low-income by virtue of receiving a Federal Pell Grant, were also arrayed by policy status and campus. There were a large number of comparison group students for three of the four cells. For these subgroups, comparison group students were selected randomly to obtain a number equal to the number of TFCS students. For the one cell that had slightly fewer students in the comparison group (IUB, post-policy), the comparison group was slightly smaller. A small number of additional cases were dropped from both groups due to some missing values on key variables. The final dataset includes, 2,100 non-TFCS Pell students enrolled at IUB and 1,786 were enrolled at IUPUI (see Table 10). As IUB and IUPUI are two different learning environments with somewhat different student populations, this study will estimate separate models for each campus to obtain the power of the numbers without potentially confounding “unmeasured” factors that might be present if this study included additional Indiana institutions (e.g., Ball State University, Purdue University, University of Notre Dame, University of Southern Indiana).

First-time enrollment was defined as students who have not earned more than 12 college credits at any public or private postsecondary institution prior to being admitted at IUB or IUPUI. Students who completed summer courses prior to fall enrollment or who had earned Advanced Placement (AP) credits and dual credits were considered first-time, full-time, first year students in the data analysis. However, students who had transferred in enough credits earned through AP or dual credit to be classified beyond the first-year level (that is, sophomore or

junior) were not regarded as first-time students. Full-time status was determined based solely on first semester credits attempted. Student who attempted at least 12 credits were deemed as full-time. In addition, undocumented, veteran, and students over the age 24 were excluded from the data analysis.

The descriptive statistics of the samples at both IUB and IUPUI are provided in Chapter 4. It is important to note that the sample consists of students with different levels of estimated family contribution (EFC) with distinctly different levels of unmet financial need. Additionally, student's eligibility criteria and renewal of the Indiana TFCS award can vary from year to year based on their yearly credit accumulation, cumulative GPA, residency status, and EFC derived from Free Application for Federal Student Aid (FAFSA). However, all participants are Indiana residents and are defined as low-income through the information collected through the FAFSA.

Variables of Interest

Informed by the on-going policy changes at the ICHE and the demand to produce equity-oriented research of policies, this study explores the impact of the *15 to Finish* initiative on college completion for students receiving the Indiana TFCS at IUB and IUPUI. The variables of interest incorporated in this dissertation included cumulative academic college progress variables (e.g., Year 1 Cumulative GPA, Year 1 Cumulative Credits Completed, Year 2 Cumulative Credits Completed), pre-college characteristics (e.g., high school GPA, SAT score), demographic factors (e.g., race, gender, generation status), and college completion status (e.g., Year 4 Graduation Status, Year 6 Graduation/Enrollment Status).

Table 7 provides a detailed list of the variables or areas of measurements used in this study along with description and source. Because this study only analyzed data from two public research universities that are part of the Indiana University system, institutional covariates, such

as total student enrollment, minority enrollment percentage, or male enrollment percentage are not considered in this study.

Table 7

Overview of Grouping Variables, Continuous Variables, and Independent Variables

Variable	Description
<i>Grouping Variables</i>	
Pre/Post Policy Implementation (i.e., Time)	Whether the student entered before (Fall 2011 or 2012) or after (Fall 2013 or 2014) the policy went into effect (0= <i>pre policy, 2011-2012</i> , 1= <i>post policy, 2013-2014</i>)
TFCS Recipient Status	Student was reported to receive the TFCS recipient (0= <i>non-TFCS Pell recipient</i> , 1= <i>TFCS recipient</i>)
<i>Continuous Outcomes</i>	
Year 1 Cumulative Credits Completed	Annual cumulative credits successfully completed in first year by the student
Year 2 Cumulative Credits Completed	Annual cumulative credits successfully completed in second year by the student
Year 1 Cumulative GPA	Annual cumulative grade point average (GPA) of all courses completed in first year by the student
<i>Dichotomous Outcomes</i>	
Year 4 Graduation Status	Binary indicator of whether the student was awarded a baccalaureate degree after Year 4 (0= <i>no</i> , 1= <i>yes</i>)
Year 6 Graduation/Enrollment Status	Binary indicator of whether the student was either awarded a baccalaureate degree by Year 6 or was still enrolled in academic coursework (0= <i>no</i> , 1= <i>yes</i>)
<i>Pre-College Characteristics</i>	
High School GPA	Average high school cumulative GPA converted to 4.00 scale
SAT Score	Average SAT score (or converted ACT to SAT score)
<i>Demographic Factors</i>	
Race	Race or ethnic group as reported by the institution (1 = <i>Caucasian/White</i> , 2 = <i>African American/Black</i> , 3 = <i>Hispanic/Latino</i> , 4 = <i>Asian American and Pacific Islander</i> , 5 = <i>Multiracial American</i> , 6 = <i>American Indian</i> , 7 = <i>Other/Unknown</i>)
Gender	Gender (1= <i>male</i> , 2= <i>female</i>)
Generation Status	Whether neither parent/guardian has a bachelor's degree of higher (0= <i>no</i> , 1= <i>yes</i>)

Source: Indiana University's University Institutional Research and Reporting (UIRR) (2019)

Continuous and Dichotomous Variables

The continuous and dichotomous variables (dependent variables) for this study include Year 1 Cumulative Credits Completed, Year 2 Cumulative Credits Completed, Year 1 Cumulative GPA, Year 4 Graduation Status, and Year 6 Graduation/Enrollment Status. This study uses Year 4 Graduation Status and Year 6 Graduation/Enrollment Status to assess the on-time completion and delayed completion, respectively, of TFCS recipients at IUB and IUPUI. The goal of these binary variables is to determine if the policy change has a positive effect of increasing on-time completion of low-income, first-generation students as the Indiana TFCS funds up to four years.

Academic courses where a student receives a grade of F or W are not counted toward the final Year 1 Cumulative Credits Completed and Year 2 Cumulative Credits Completed. Furthermore, remedial courses with a prefixed 0 are not added to the final Year 1 Cumulative Credits Completed and Year 2 Cumulative Credits Completed count, as the Indiana TFCS Program does not count these courses into the 30-credit hour completion requirement.

Year 1 Cumulative GPA represents the cumulative GPA of all courses a student completes in their first year at IUB or IUPUI. Remedial (courses with a prefixed 0) are not factored into the student's Year 1 Cumulative GPA, as the Indiana TFCS Program does not count these courses into the 30-credit hour completion requirement.

Year 4 Graduation Status represents the graduation status of each student as reported by their institution in Year 4. A student must have completed a minimum of 120 semester credits and satisfied all general education and major requirements to graduate from either IUB or IUPUI. It is important to note that the TFCS funds up to 4-years of mandatory tuition and fees for TFCS recipients at IUB and IUPUI.

Year 6 Graduation/Enrollment Status represents the graduation/enrollment status of each student as of the fall semester of the sixth year after they entered the institution. It is important to note that all the students in this analysis likely received other financial aid support through the Federal Pell Grant or institutional-based scholarship programs (e.g., IUB Groups Scholarship Program, IUB Hudson & Holland Scholarship Program, IUPUI Norman Brown Diversity and Leadership Scholars Program (NBDLSP), IUPUI Diversity Scholars Research Program).

The study employs several dichotomous or binary variables, including one that reflects the Policy implementation (time change from before and after the target policy was implemented) and one the group membership indicator. The Pre/Post Policy Implementation (i.e., Time) variable represents whether the student started before or after the implementation of Indiana Code 21-12-6-7 that requires students to complete 30-credit hours per academic year to renew the TFCS. The 30-credit hour annual completion policy was implemented in Fall 2013. Students enrolled prior to 2013 were coded as 0 (pre-policy) and students enrolled after 2013 were coded as 1 (post-policy).

The selection variable TFCS Recipient Status reflects whether the students were identified and received the TFCS in their first year of full-time enrollment at IUB or IUPUI. Students who received the TFCS were coded as 1 and non-TFCS Pell recipient were coded as 0.

The Federal Pell Grant variable (Low-Income Status), while available in the UIRR-derived dataset, is not used in this study because such grouping variable often suffer from measurement error and potentially miss enrollment effects (Rosinger & Ford, 2019).

Independent Variables

In aligning with past literature, the independent (predictor) variables for the study are grouped into two overarching categories: (a) academic background and (b) demographic factors.

Pre-college characteristic variables include High School GPA and SAT Score (or ACT equivalent score). High School GPA represents the high school grades converted to a common 4.0 scale. The highest cumulative GPA reported in this study is 4.00. The 0.00 GPA reported by the institution may either be unreported or inapplicable to the student admissions at IUB or IUPUI. SAT Score (or converted ACT) represents the total SAT score between 400 and 1600. The highest SAT score in this study is 1540, and the lowest is 510.

Demographic factor variables include Race, Gender, and Generation Status. Race defined as the race or ethnic group of the student is drawn from the IU UIRR-derived database. A student is assigned to a race/ethnicity category based on their race/ethnicity as reported in their application to IUB or IUPUI. Students respond to two questions related to their race/ethnicity: whether they are of Hispanic origin (yes/no), and to indicate any or all racial categories to which they identify as belonging. In deriving the reported racial ethnic group, it is first determined that the student is a U.S. citizen or permanent resident, using information about their citizenship and visa status. Those who are not a U.S. citizen or permanent resident are reported as Non-Resident Alien. After this exclusion, students who responded they are of Hispanic origin are reported as Hispanic. Remaining students who selected a single racial/ethnic group are reported within that group, and those who reported identifying with multiple groups are reported as Multiracial.

Table 8 defines the standard federal categories used in this study.

Table 8

Standard Federal Race/Ethnicity Categories and Description, 2018-2019

Category	Description
White/ Caucasian	A person having origins in any of the original peoples of Europe, the Middle East, or North Africa
Black/African American	A person having origins in any of the Black racial groups of Africa.
Hispanic/Latino	A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race
Asian/Asian American and Pacific Islander	A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian Subcontinent, including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam
Native American/ American Indian	A person having origins in any of the original peoples of North and South America (including Central America) who maintains cultural identification through tribal affiliation or community attachment
Non-Resident/Alien	A person having no U.S. citizenship or permanent resident

Sources: NCES, IPEDS (2019)

Gender represents the biological binary distinction of male or female. Other genders such as transgender, genderqueer, bigender, and agender were not reported ascertained in the application form and therefore do not appear in the IU UIRR-derived database.

Generation Status represents the parental educational attainment of the student. Students provide information on the highest credential earned by their parents or legal guardians. It is defined as “an individual neither of whose natural or adoptive parents received a baccalaureate degree” (IU UIRR, 2019, p. x). If either parent or guardian has a bachelor’s or higher-level degree, the student is continuing generation.

Analytical Methods

This observational study employs a quasi-experimental, DiD approach to compare Indiana TFCS recipients pre- and post-policy recipients to identify the grades, progression, and completion among low-income, first-generation college students at IUB and IUPUI. More specifically, this dissertation compares Indiana TFCS recipients to a comparison group of non-

TFCS Pell recipients to identify whether the 30-credit hour annual completion policy affected the academic performance of students in these groups regarding credit hour accumulation, cumulative GPA, persistence, and graduation. The study will combine students who entered the two years prior to 2013 and those who entered the two years post policy as two separate samples. Specifically, I combined the data from Fall 2011 and Fall 2012 into a pre-policy cohort. For the Fall 2011 group, year 1 refers to academic year 2011-12 and year 2 refers to academic year 2012-013. For the Fall 2012 cohort, year 1 measures pertain to academic year 2012-13 and year 2 to 2013-14. The Fall 2013 and Fall 2014 cohorts were combined into a post-policy cohort, with the years tracked analogously to those of the earlier cohorts (e.g., Year 1 for the Fall 2013 being 2013-14, etc.).

Difference-in-Differences Technique: Rationale

The primary rationale for selecting the DiD design is to create control and experimental groups to assess a change or implementation of a policy in the Indiana TFCS Program (Hillman, Tandberg, & Gross, 2014). Specifically, the DiD design determine a program effect that occurs at a point in time, as long as other aspects of the context do not change (Kelchen, Rosinger, & Ortagus, 2019). For example, DiD estimation can compare the difference in academic outcomes (e.g., Year 1 Credit Hours Completed, Year 2 Credit Hours Completed, Year 1 Cumulative GPA) before and after the 30-credit hour completion took effect in Fall 2013 (treatment group) to the difference in academic outcomes for those that did not receive the treatment (control group).

In general, the DiD method uses comparison groups to estimate treatment effects (Rubin, 1974). Specifically, the model estimates the differences between two groups before and after a “treatment” (policy implementation) to which only one of the groups has been exposed, in this

case the 30-credit hour annual completion policy. The DiD method is considered a natural experiment that accounts for selection effects that arise from the non-random assignment of students to the treatment (Goodman-Bacon, 2019). The model can also accommodate covariates (e.g., student demographics and academic background) related to the outcomes (Billings, 2018). Any difference in the outcome variable in terms of credit hour accumulation or GPA is either a result of the policy adoption or other unmeasured external factors affecting the target group but not the control group (Zhang, Hu, & Sensenig, 2013).

Historically, policy analysis or program evaluation studies employ a DiD estimation strategy, which “treats the introduction of [a policy] as a plausible source of exogenous variation” (Tandberg & Hillman, 2014, p. 230). The DiD methodology has been used in higher education policy research to identify the changes in student performance influenced by the implementation of a policy (Hagwood, 2019; Kelchen, 2019). For example, Zhang (2011) used the DiD design to understand the effects of merit-based aid on degree production in STEM fields. Similarly, Schudde and Scott-Clayton (2016) employed a DiD design to examine the impact of a new academic progress requirement on student outcomes. Zilvinskis, Borden, and Severtis (2017) used DiD to explore the effects of a conditional admission policy on student performance. Kramer, Holcomb, and Kelchen (2018) used DiD to investigate the costs and consequences of excess credit hours policies on college completion. Gurantz (2020) used DiD to examine the early impact of the Oregon Promise on college enrollments, while Page et al. (2019) used DiD and regression discontinuity to investigate the impact of the Pittsburgh Promise on student persistence. In other words, past studies have used DiD to explore the impact of higher education policy changes on college student outcomes. The DiD framework assumes the differences observed between groups and over time are caused by the policy implementation and

that nothing else influenced the observed change. The policy change examined in this study is an appropriate setting for using the DiD technique due to its ability to estimate a causal effect using longitudinal observational data and its ability to compare groups that have similar characteristics but potentially different levels of the outcome variable (e.g., grades and progression) (Kelchen, Rosinger, & Ortagus, 2019).

A hypothetical model of the DiD testing of yearly credit hours accumulated is shown in Figure 2. Specifically, Figure 2 illustrates the treatment effects of the 30-credit hour completion policy can be estimated by taking the pre-policy difference between groups ($P_1 - S_1$) as an estimate of what the year 2016 difference would be without the policy ($Q - P_2$). By doing so, the policy effect can be obtained by subtracting the pre-policy difference ($P_1 - S_1$, also represented by $Q - P_2$) from the post-policy difference ($P_2 - S_2$). This effect size is shown on the chart as the difference between P_2 and Q .

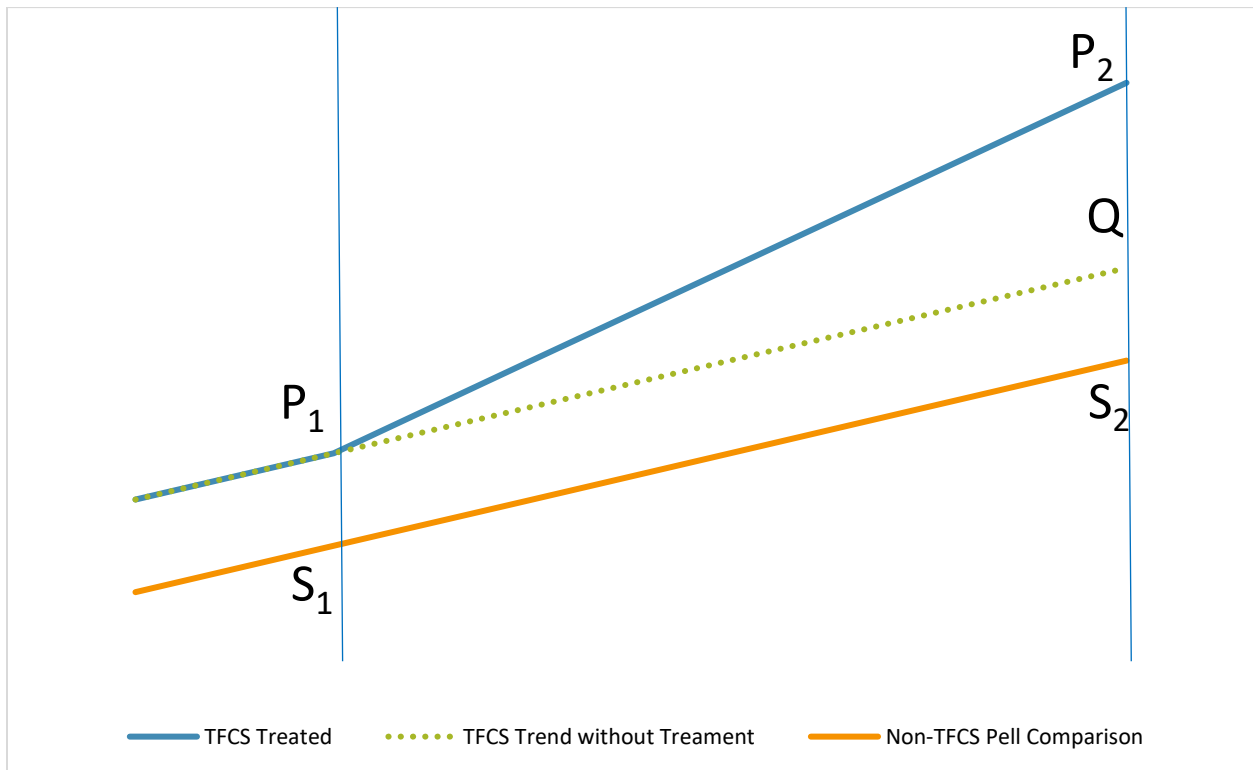


Figure 2. Example of difference-in-differences estimation

Regression Specifications of Difference-in-Differences Method

Ordinary least squares (OLS) estimations will be applied to the five dependent variables (i.e., Year 1 Cumulative Credits Completed, Year 2 Cumulative Credits Completed, Year 1 Cumulative GPA, Year 4 Graduation Status, Year 6 Graduation/Enrollment Status) which are often used to evaluate and assess academic progression and completion of college students (Higher Learning Commission [HLC], 2019b). Ordinary least squares estimation has been used in higher education policy research to approximate how a series of independent variables are associated with the outcome variable. Two sets of OLS regression models were used in this study: (a) an initial pre-post comparison (i.e., a first difference) with only the treated group, and (b) group differences of the treated and control groups (TFCS recipients relative to non-TFCS Pell recipients).

A simple pre-post comparison (i.e., a first difference) was initially examined to identify the changes of the academic outcomes of Indiana TFCS recipients before and after the policy was introduced in Fall 2013 (includes only the “treated” group). The OLS estimation is defined in the following equation:

$$y_i = \alpha + \theta TIME_i + v_i \quad (1)$$

where y (e.g., Year 1 Cumulative Credits, Year 1 Cumulative GPA) denotes the academic outcome variables for a given student (i). Academic outcomes are defined as the credit hours completed in Year 1, the cumulative GPA in Year 1, the students’ graduation status in Year 4, and the graduation status or still enrolled status in Year 6. The α is the intercept, θ is the parameter that estimates the policy effect before taking into account the group differences, the Policy is a dichotomous variable indicating the pre- (0) and post (1) policy observations, and v is

the standard error terms. For all models, standard errors are clustered to adjust for serial correlation and heteroskedasticity in DiD estimates for a large sample size.

A second OLS model is then employed to estimate group (e.g., TFCS recipients versus non-TFCS Pell recipients) by policy interaction effects. More specifically, the study uses dichotomous or binary variables (e.g., TFCS status, policy period), to assess whether the policy effected the TFCS group and not the control group, without considering the student level covariates. The fixed equation is an extension of the simple regression equation listed in Model 1:

$$y_i = \alpha + \beta_{int}(\text{GROUP}_i \times \text{TIME}_i) + \delta \text{GROUP} + \theta \text{TIME}_i + v_i \quad (2)$$

where the effect of most interest is β_{int} , which determines if the policy has a differential effect on the groups (i.e., TFCS recipients vs. non-TFCS Pell recipients). If the TFCS group is 1 and non-TFCS Pell is “0,” and if the Time is “0 = year(s) before,” and “1 = year(s) after policy,” then the coefficient of interest, β_{int} , is the critical parameter. In other words, the “ $\text{GROUP}_i \times \text{TIME}_i$ ” is an interaction, reflecting how the academic outcome variables changes in the TFCS recipient group relative to a non-TFCS Pell recipient group based on student’s TFCS status. The β_{int} represents the parameter of interest showing the differential estimate of the effects of the 30-credit hour completion policy by indicating if and how TFCS recipients respond to the policy after its implementation in Fall 2013. This estimator represents an intent-to-treat effect. While this study can estimate the impact for treatment on the treated as well as intent-treat effects, it is not possible because the DiD estimation cannot observe which TFCS or non-TFCS Pell recipients would have completed 30 credits per academic year in the pre-policy period. However, this study expects the estimates of intent-to-treat effects and treatment-on-the-treated effects to be close.

The δ parameter represents the group different effect, if any, shown in Figure 2 as $P_1 - S_1$, and Q

– P₂. The model can account for specific non-TFCS Pell pre-policy cohorts in the θ parameter that are distinct to the TFCS pre-policy cohorts (α). Because this study is testing time difference and time change from before to after the policy went into effect in which treatment begins, the “GROUP_{*i*} × TIME_{*j*}” interaction is set to equal one in the years during and following the adoption of the 30-credit hour completion policy. It is important to note that the β_{int} is estimated for each of the five outcomes: Year 1 Cumulative Credit Completed, Year 2 Cumulative Credits Completed, Year 1 Cumulative GPA, Year 4 Graduation Status, and Year 6 Graduation/Enrollment Status.

After the policy effect is examined, ANOVA was used to test group differences in means on academic progress between TFCS recipients in pre-policy years and TFCS recipients in the post-policy period, controlling for the covariates noted earlier. Specifically, factorial ANOVAs assess the effects of two or more independent (predictor) variables on a single dependent (outcome) variable and any possible combined effects of the independent variables within the same analysis (Ary, Jacobs, & Razavieh, 2002). The factorial ANOVA analysis provides the final test of the policy effect controlling for student demographics and academic background in five outcomes. If the ANOVA showed significant interaction effects, then a marginal mean estimate chart was drawn to illustrate the outcomes over time when controlling for covariates. As noted by Kelchen, Rosinger, and Ortagus (2019), “In a relatively simple DiD model when policy adoption occurs at one time period but multiple pre-policy years are observed, researchers can visually examine outcomes for pre-policy trends... Although visualizations of pre-policy trends do not offer a formal statistical test of the parallel trend assumption, we still recommend researchers provide this visualization in some form when treatment is measured continuously” (p. 11).

The validity of the DiD approach rests on two assumptions. The first assumption is that outcome measures of interest are trending similarly for the TFCS and non-TFCS Pell recipients before and after the policy adoption of the 30-credit hour annual completion policy. Hypothetically, without the 30-credit hour annual completion policy, the outcomes of the two groups would have generated a common, parallel trend (i.e., parallel pathways assumption). If this assumption is violated, estimates obtained from the DiD model will be biased. A deviation from the common, parallel trend suggests a treatment effect by the 30-credit hour completion policy. The second assumption is that nothing besides the 30-credit hour completion requirement would have affected the post-policy group outcomes differentially between groups. In this case, the coefficient β_{int} will consistently estimate the effect of 30-credit hour completion post-policy students on outcome y . In other words, the primary coefficient of interest is β_{int} which is the DiD estimate of the effect of the 30-credit hour completion policy on academic outcomes.

Limitations of the Study

The limitation of any research using extant data is identifying causality. Specifically, scholar-practitioners and educational policymakers should use extra caution when interpreting the study results as causal because it is possible there are other differences between the Indiana TFCS and non-TFCS Pell cohort that could allow one group to look different from the other in both the pre-treatment and posttreatment periods. While the use of DiD can offer an opportunity to isolate a treatment effect that controls for non-random assignment to condition compared to basic ordinary least square (OLS) regression, it is possible some sources of bias remain.

For example, one limitation is that the study did not consider for a potential lagged effect, where TFCS recipients may not respond immediately to the adoption of the 30-credit hour annual completion policy. Because the study did not examine if there was a delayed effect, it is

possible some of the improvements in the Year 1 Cumulative Credit Hours and Year 1 Cumulative GPA of TFCS recipients during the pre- and post-policy periods at IUB and IUPUI are attributable to the improvement of student support service offices (i.e., IUB TFCS Program, IUPUI TFCS Program) in terms of first year orientation or faculty-student mentoring programs (see Appendices F and G). As such, it is plausible the empirical models used in this study do not adequately represent or illustrate the effect of 30-credit hour annual completion policy on college progression and completion.

The second data limitation is the inability to determine whether the reasons students depart IUB or IUPUI is the direct result of the 30-credit hour annual completion policy or other reasons that differ systematically between the groups (e.g., mental health, educational goal, parental involvement). This issue coincides with past research conducted by Gross et al. (2015) and Toutkoushian et al. (2015) who discovered that the use of secondary administrative data limits the ability to capture other potential exogenous factors that are correlated with the treatment and the outcome (sample endogeneity). This study is no different in that the data analysis cannot identify the rationale for TFCS recipient departure, whether it be the 30-credit hour annual completion policy, unsupportive campus environments, or other affective dispositions. Additionally, the IU UIRR-derived data do not reveal whether the TFCS recipient has left to pursue their studies at a different institution outside of Indiana, or if the student has accepted full-time employment for a local company or organization. In other words, it is plausible the impact of the 30-credit hour annual completion policy on academic outcome is attributable to external forces beyond the control of this study.

Thirdly, this study is limited to only 4-year college students at two distinctive public research institutions in Indiana. Due to the vast differences in the characteristics of 4-year public

institutions, the results of this study may not be applicable to private institutions, minority serving institutions, for-profit universities, religiously affiliated universities, or even similar types of institutions in other states. Furthermore, the results may not be applicable for 2-year colleges or any institutions outside of Indiana (due to different types of college promise programs). Given the rise of college promise programs at the community college level, future research should use multiple types of institution to understand the longer-term effects of the *15 to Finish* initiative on progression and completion of promise program recipients at 2-year institutions (Dowd, Rosinger, & Castro, 2020).

Finally, this study is limited by the current nature of promise programs, virtually all of which serve only traditional-age, direct from high school students, who enroll full-time in college. This study does not include part time students, nontraditional students or post-traditional students who decide to return to higher education to pursue a baccalaureate degree (i.e., some college, no degree). As policymakers and politicians begin to design college promise programs with a promise to serve nontraditional and post traditional students (e.g., Tennessee Reconnect, Indiana Adult Student Grant), educational researchers and practitioners should not assume that these results will generalize to these other populations.

Summary

In summary, this study seeks to understand the policy effect of the 30-credit hour completion on the academic outcomes of TFCS recipients at two types of institution, IUB, and IUPUI. To do so, it employs a quasi-experimental, DiD regression analysis. The following outcomes are included in the DiD analyses: Year 1 Cumulative Credit Completed, Year 2 Cumulative Credits Completed, Year 1 Cumulative GPA, Year 4 Graduation Status, and Year 6 Graduation/Enrollment Status. The independent variables consisting of pre-college

characteristics and demographic factors are High School GPA, SAT Score, Gender, Generation Status, and Race. The effect of interest is the interaction of the TFCS group and the academic outcomes of TFCS recipients at IUB and IUPUI, which represents DiD estimate of the effects of the 30-credit hour completion policy on the dependent variables. The grouping variables in this study are the 30-credit hour completion policy and award recipient status. This study also discusses some limitations of the data source and methods.

CHAPTER 4: RESULTS

This dissertation employs a quasi-experimental, difference-in-differences (DiD) approach to examine two main research questions: (1) to what extent did the 30-credit hour annual completion policy (*15 to Finish*) achieve its intended effects: increasing credit accumulation, improving student progress and increasing graduation rates? and (2) to what extent are any of the identified policy effects moderated by demographic factors (race, gender, generation status) and pre-college characteristics (high school GPA, SAT score, that is, to what extent did the policy appear to have differential effects for various types of students?

The results of this chapter are divided into three primary sections. First, this chapter presents descriptive statistics related to the predictors, covariates and outcomes employed in the subsequent analysis for both IUB and IUPUI. The chapter then presents the regression results from the DiD estimation that tests the treatment and control effect of the 30-credit hour annual completion policy (*15 to Finish*) on college progression and completion at IUB and IUPUI. The chapter then provides evidence as to whether any identified policy effect differs for different types of students (by race, gender, first generation status and academic background) using ANOVA to determine whether each factor interest interacts with the key policy variable among just the TFCS group. In the end, the chapter outlines the interaction effects of the policy and whether the policy has a heterogeneous effect on TFCS recipients enrolled at the two different types of campuses included in the study. Ultimately, the objective of this chapter is to evaluate the effectiveness of the 30-credit hour annual completion policy in achieving its intended goal, namely, improved degree completion rates of low-income, first-generation students enrolled at Indiana public research universities.

Descriptive Statistics

This section summarizes the descriptive statistics for the Fall 2011 through Fall 2014 cohorts from the IU UIRR-derived database. Data were imported to Stata 16 and JASP statistical analysis program to represent information on the analytic sample of TFCS recipients and non-TFCS Pell recipients who first enrolled between 2011-12 and 2013-14 at IUB and IUPUI.

Grouping Variables

Table 9 provides the descriptive statistics for the aggregated student groups between 2011 and 2014 at IUB, and IUPUI.

Table 9

Grouping Variables of Award Recipient and Policy Group at Indiana University Bloomington (IUB) and Indiana University-Purdue University, Indianapolis (IUPUI)

	IUB		IUPUI	
	<i>N</i>	%	<i>N</i>	%
Total Students	4,265	100%	3,577	100%
Award Status ^a				
TFCS	2,155	50.5%	1,791	50.1%
Non-TFCS Pell	2,110	49.5%	1,786	49.9%
Time Status* ^b				
Pre-Policy Implementation	1,995	46.8%	1,323	37.0%
Post-Policy Implementation	2,270	53.2%	2,254	63.0%

^a $\chi^2(1) = 0.16, p=.69, ns$; ^b $\chi^2(1) = 76.4, p<.001$

*Based on cohort entry year with 2011, 2012 Pre-Policy Implementation status and 2013, 2014 the Post-Policy Implementation status

IUPUI admitted a much larger number of TFCS in the two post-policy cohorts (63%) compared to the two pre-policy cohorts (37%). The group sizes were more consistent for IUB (46.8% vs. 53.2%). Because of the design process used to select a near equal number of non-TFCS Pell students for each campus, there is greater similarity in the Award Status group (50% vs. 49%) at both IUB and IUPUI. The results of the chi-square test for independence suggests that Award Status was not significantly different between groups ($\chi^2(1) = 0.16, p=.69, ns$), by design. On the

other hand, the Time Status groups were statistically significantly different in size ($\chi^2(1) = 76.4$, $p < .001$). The total number of students in this sample was slightly higher at IUB compared to IUPUI (4,265 vs. 3,577).

Independent Variables

Table 10 provides the descriptive statistics for the demographic factors used in this study. Specifically, there is substantially a greater proportion of Females compared to Males at both IUB (57.3% vs. 42.7%) and especially at IUPUI (64.3% vs. 35.7%). In addition, the percentage of Continuing-Generation students is higher at IUB (56%), whereas the percentage of First-Generation students was slightly greater at IUPUI (52.7%). White/Caucasian students represent a significant majority at both IUB (61.3%) and IUPUI (60.2%). The chi-square test for independence reveals that the proportions by both Gender ($\chi^2(1) = 40.43$, $p < .001$) and Generation Status ($\chi^2(1) = 59.54$, $p < .001$) were significantly different between campuses. On the other hand, the Race/Ethnicity distribution was not significantly different between campuses ($\chi^2(1) = 1.96$, $p < .92$, ns).

Table 10

Independent Variables of Demographic Factors at Indiana University Bloomington (IUB) and Indiana University-Purdue University, Indianapolis (IUPUI)

	IUB		IUPUI	
	<i>N</i>	%	<i>N</i>	%
Gender^a				
Female	2,443	57.3%	2,301	64.3%
Male	1,822	42.7%	1,276	35.7%
Generation Status^b				
First-Generation	1,876	44.0%	1,886	52.7%
Continuing-Generation	2,389	56.0%	1,691	47.3%
Race/Ethnicity^c				
White/Caucasian	2,614	61.3%	2,152	60.2%
African American/Black	906	21.2%	769	21.5%
Hispanic/Latinx	397	9.3%	352	9.8%
Asian American	255	6.0%	221	6.2%
American Indian	40	0.9%	32	0.9%
Non-Resident/Alien	2	0.0%	3	0.1%
Other/Unknown ^d	51	1.2%	18	1.3%

^a $\chi^2(1) = 40.43, p < .001$; ^b $\chi^2(1) = 59.54, p < .001$; ^c $\chi^2(1) = 1.96, p < .92, ns$; ^dOther/Unknown indicate that student refused to answer, not applicable, and/or no response.

Pre-College Characteristics

Table 11 provides the descriptive statistics for the pre-college characteristics (academic background) used in this study. Both average High School GPA (3.56 for IUB vs. 3.30 for IUPUI) and SAT Scores reported (1182 for IUB vs. 1057 for IUPUI) were significantly higher at IUB, reflecting the higher admissions selectivity of the Bloomington campus.

Table 11

Pre-College Characteristics of Academic Performance Group at Indiana University Bloomington (IUB) and Indiana University-Purdue University, Indianapolis (IUPUI)

	IUB		IUPUI	
	<i>N</i>	Mean	<i>N</i>	Mean
Academic Performance Group				
High School GPA ^a	4,217	3.56	3,484	3.30
SAT Score ^b	4,258	1182	3,488	1057

^at(7840)= 30.16, *p*<.001; ^bt(7840)= 41.17, *p*<.001

Continuous (Dependent) Outcome Variables

Table 12 provides the descriptive statistics for the continuous (dependent) outcome variables used in this study.

Table 12

Continuous Outcome Variables of Academic Progress Group at Indiana University Bloomington (IUB) and Indiana University-Purdue University, Indianapolis (IUPUI)

	IUB		IUPUI	
	Mean	SD	Mean	SD
Year 1 Cum. Credits Completed ^a	35.8	10.43	28.0	11.64
Year 2 Cum. Credits Completed ^b	60.8	19.37	46.5	22.90
Year 1 Cumulative GPA ^c	2.81	0.77	2.54	0.99

^at(7840)= 31.27, *p*<.001; ^bt(7840)= 29.93, *p*<.001; ^ct(7840)= 13.78, *p*<.001

Like most residential campus that enrolls predominantly full-time students, the Year 1 Cumulative Credits Completed were higher among IUB student in the sample (*M* = 35.8, *SD* = 10.43) compared to IUPUI students in the sample (*M* = 28.0, *SD* = 11.64, *t*(7840)= 31.27, *p*<.001. Appendix O and Appendix P provide the descriptive statistics of the academic progress variables by award status group at IUB and IUPUI. Specifically, Appendix O shows that non-TFCS Pell recipients at IUB achieved slightly higher cumulative year-to-year credits compared to TFCS recipients. On the other hand, Appendix P illustrates that TFCS recipients performed slightly better than non-TFCS Pell recipients at IUPUI in terms of credits and GPA.

Dichotomous (Binary) Outcome Variables

Table 13 provides the descriptive statistics for the dichotomous (binary) graduation outcome variables used in this study.

Table 13

Dichotomous (Binary) Outcome Variables of Academic Progress Group at Indiana University Bloomington (IUB) and Indiana University-Purdue University, Indianapolis (IUPUI)

	IUB		IUPUI	
	N	%	N	%
Year 4 Graduation Status ^a				
Graduated	2,201	51.6%	855	23.9%
Not Graduated	2,064	48.4%	2,722	76.1%
Year 6 Graduation/Enrollment Status ^b				
Graduated or still enrolled	2,925	68.6%	1,699	47.5%
Neither graduated nor enrolled	1,340	31.4%	1,878	52.5%

^a $\chi^2(1) = 627.776, p < .001$; ^b $\chi^2(1) = 357.396, p < .001$

The Year 4 Graduation Status indicates that IUB students in the samples were more than twice as likely to graduate than IUPUI students (51.6% vs. 23.9%). This gap in graduation status narrowed slightly by Year 6 when roughly two-thirds of the IUB students finished or were still pursuing their degree, compared to just under one-half (47.5%) of the IUPUI students.

Differences were both statistically significant as shown in Table 13. Appendix O and Appendix P provide the descriptive statistics of the college completion status variables by award status group at IUB and IUPUI. The notable differences across these variables support the design choice to examine the impact of the policy separately for IUB and IUPUI: the campuses clearly serve notably different types of students, even when considering those who qualify for the TFCS or are non-TFCS Pell recipients.

Difference-in-Differences (DiD) Analyses

The DiD analysis addresses the first research question of this study.

Research Question 1: To what extent did the 30-credit hour annual completion policy (*15 to Finish*) achieve its intended effects: increasing credit accumulation, improving student progress and increasing graduation rates?

Table 14 provides the DiD estimates when accounting for specific group (TFCS recipients, non-TFCS Pell Recipients) and treatment (Pre-Policy, Post-Policy) differences. The interaction effect (TIME \times GROUP) in the ordinary least square (OLS) model suggests a significant effect for Year 1 Cumulative Credits Completed ($p < .001$), Year 2 Cumulative Credits Completed ($p < .01$), and Year 1 Cumulative GPA ($p < .05$) at IUB, indicating that the 30-credit hour completion policy improved students' academic outcomes in terms of cumulative credit hours accumulation, and, to a slightly weaker extent for cumulative GPA.. However, the interaction effects were non-significant for the IUPUI samples, suggesting that the 30-credit hour completion policy did not achieve its intended effects: increasing credit accumulation and improving student grades.

In relation to whether the Time itself impacted the TFCS students, the DiD results showed a positive significant effects (time difference) at IUPUI for the Year 1 Cumulative Credits ($p < .01$) and Year 2 Cumulative Credits ($p < .05$), suggesting that changes were happening at IUPUI that effects both (TFCS and Non-TFCS Pell) similarly (see Table 14). On the other hand, although IUB TFCS recipients averaged 1.24 lower Year 1 Cumulative Credits and 2.61 Year 2 Cumulative Credits compared to the Non-TFCS IUB sample, the policy appears to have more than made up for this differences, resulting in 2.05 credit hour completion increase for year 1, and a 3.51 credit hour completion increase for year 2 credits for students at IUB. There was also a 0.11 Year 1 Cumulative GPA boost attributable to the Policy change.

Table 14

Difference-in-Differences (DiD) Analyses for Treatment and Control Effects across Policy Groups at Indiana University Bloomington (IUB) and Indiana University-Purdue University, Indianapolis (IUPUI)

	IU Bloomington (N = 4,265)			IUPUI (N = 3,577)		
	TIME	Group	Time × Group	TIME	Group	Time × Group
Year 1 Cumulative Credits Completed						
B	-0.31	-1.24	2.047	2.4	0.09	0.865
SE(B)	0.454	0.466	0.649	0.566	0.635	0.8
t-stat	-0.68	0.64	3.2	4.24	0.15	1.08
Sig.	ns	**	***	***	ns	ns
	(intercept = 36.06, SE=0.33, $p < .001$; $R^2 = .003$)			(intercept = 26.19, SE=0.45, $p < .001$; $R^2 = .015$)		
Year 2 Cumulative Credits Completed						
B	-1.03	-2.61	3.516	2.28	-0.02	1.503
SE(B)	0.844	0.866	1.188	1.12	1.256	1.583
t-stat	-1.22	-3.02	2.96	2.03	-0.02	0.95
Sig.	ns	**	**	*	ns	ns
	(intercept = 61.72, SE=0.614, $p < .001$; $R^2 = .003$)			(intercept = 44.62, SE=0.89, $p < .001$; $R^2 = .005$)		
Year 1 Cumulative GPA						
B	-0.2	-0.04	0.106	0.03	-0.103	0.004
SE(B)	0.341	0.332	0.024	0.485	0.054	0.069
t-stat	-5.91	-1.25	2.27	0.64	-1.9	0.06
Sig.	***	ns	*	ns	ns	ns
	(intercept = 2.91, SE=0.02, $p < .001$; $R^2 = .010$)			(intercept = 2.57, SE=0.04, $p < .001$; $R^2 = .003$)		

Notes. TIME variable indicates the pre- and post-policy implementation; the coefficient of interest is on TIME × GROUP. * $p < .05$, ** $p < .01$, *** $p < .001$; p value levels represent significant differences; sig=significant; ns=not significant; B=estimate; SE=standard error; Each coefficient is the result of a separate regression.

Binary logistic regression was also performed to examine the impact of the 30-credit hour completion policy on timely graduation and delayed graduation rate at IUB and IUPUI (see Table 15). The interaction effect in the logistic regression model suggests no significant policy-related interaction effects for Year 4 Graduation Status and Year 6 Graduation/Enrollment Status at both IUB and IUPUI, suggesting that the *15 to Finish* initiative did not improve degree completion rates. However, there was a negative significant Group effect at IUB for Year 6 Graduation/Enrollment Status ($p < .05$), suggesting that changes were happening that effects both pre- and post-policy cohorts for students who delayed graduation. The likelihood of delayed

graduation or still being enrolled decreased by a factor of 0.77 (Exp(B)) (i.e., indicates the change in odds of graduating), suggesting that the 30-credit hour completion policy initial intent to improve delayed graduation rates may have had a negative impact for low-income students at IUB. The corresponding effect of time on the Year 4 Graduation Status was in the same direction (negative) but not statistically significant.

On the other hand, the significant Time²⁰ effects at IUPUI - positive for the Year 4 Graduation Status ($p < .001$) and the negative for Year 6 Graduation/Enrollment Status ($p < .01$) - indicate that there was a general time-related effect occurring for all these low-income students at IUPUI (see Table 15). Specifically, the likelihood of on-time graduation rate increased by a factor of 1.38 (Exp(B)) but the chances of delayed graduation or still being enrolled decreased by a factor of 0.8 (Exp(B)). Although this does not pertain to how the policy affected TFCS recipients, it does suggest that broader moves to improve on-time graduation rates from the *15 to Finish* initiative appear to have had a positive impact on timely graduation but may also have had a negative impact for those students who are not able to keep that pace and decreased the overall 6 year graduation rate among low income students at IUPUI.

²⁰ The Time variable indicate the change over time for both TFCS and non-TFCS Pell recipients and does not reflect the effect of the 30-credit hour completion policy.

Table 15

Logistic Regression of Binary Variables on College Completion Status at IUB and IUPUI

	IUB (N = 4,265)			IUPUI (N = 3,577)		
	TIME	Group	Time × Group	TIME	Group	Time × Group
Year 4 Graduation Status						
<i>B</i>	0.04	-0.12	0.11	0.32	-0.01	0.24
<i>SE</i>	0.09	0.09	0.12	0.12	0.14	0.17
Wald	0.28	1.87	0.77	6.98	1.53	1.92
<i>p</i>	ns	ns	ns	***	ns	ns
Odds Ratio	1.05	0.89	1.11	1.38	0.99	1.26
Year 6 Graduation/ Enrollment Status						
<i>B</i>	-0.17	-0.26	0.12	-0.22	-0.14	0.03
<i>SE</i>	0.10	0.10	0.13	0.10	0.11	0.14
Wald	3.17	6.89	0.84	4.93	1.53	0.03
<i>p</i>	ns	***	ns	**	ns	ns
Odds Ratio	0.84	0.77	1.13	0.80	0.87	1.03

* $p < .05$, ** $p < .01$, *** $p < .001$

Marginal mean estimates of the interaction effects that are statistically significant at IUB (Year 1 Cumulative Credits, Year 2 Cumulative Credits, Year 1 Cumulative GPA) in the DiD results are displayed in Figure 3, Figure 4, and Figure 5 to show how the interaction changes between groups. This practice is commonly done to report interaction effects as recommended in Brambor, Clark, and Golder (2006). As illustrated in the marginal effects plots, there was positive significant effect of the impact of the 30-credit hour completion policy during the post-

policy period for TFCS recipients at IUB, suggesting that the policy achieved its intended goal of improving credit accumulation and student academic progress. Specifically, the marginal means estimates interaction chart illustrates a 2.05 credit hour increase on Year 1 Cumulative Credits Completed when adding the pre-policy difference total ($36.06 - 34.82 = 1.24$) from the post-policy difference total ($36.56 - 35.75 = 0.81$) (Figure 3). Likewise, there was a 3.52 credit hour increase on Year 2 Cumulative Credits Completed when adding the pre-policy difference total ($61.72 - 59.10 = 2.62$) from the post-policy difference total ($61.59 - 60.69 = 0.90$) (Figure 4). These findings verify the accuracy of Table 14 DiD analysis for the Year 1 Cumulative Credits Completed and Year 2 Cumulative Credits Completed academic progress variables at IUB. The confidence interval and standard error table of these marginal mean can be found in Appendix H.

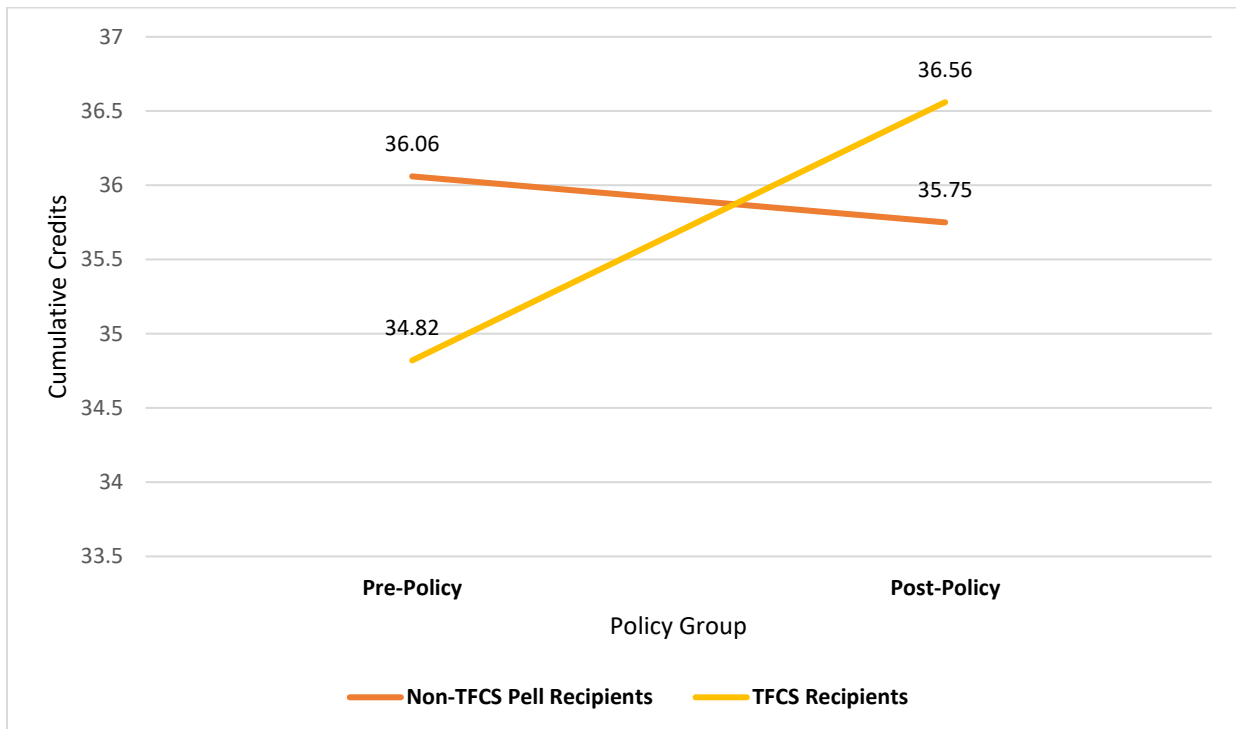


Figure 3. Marginal mean estimates of pre- and post-policy group on Year 1 Cumulative Credits (significant effects) at Indiana University Bloomington, by Award Recipients

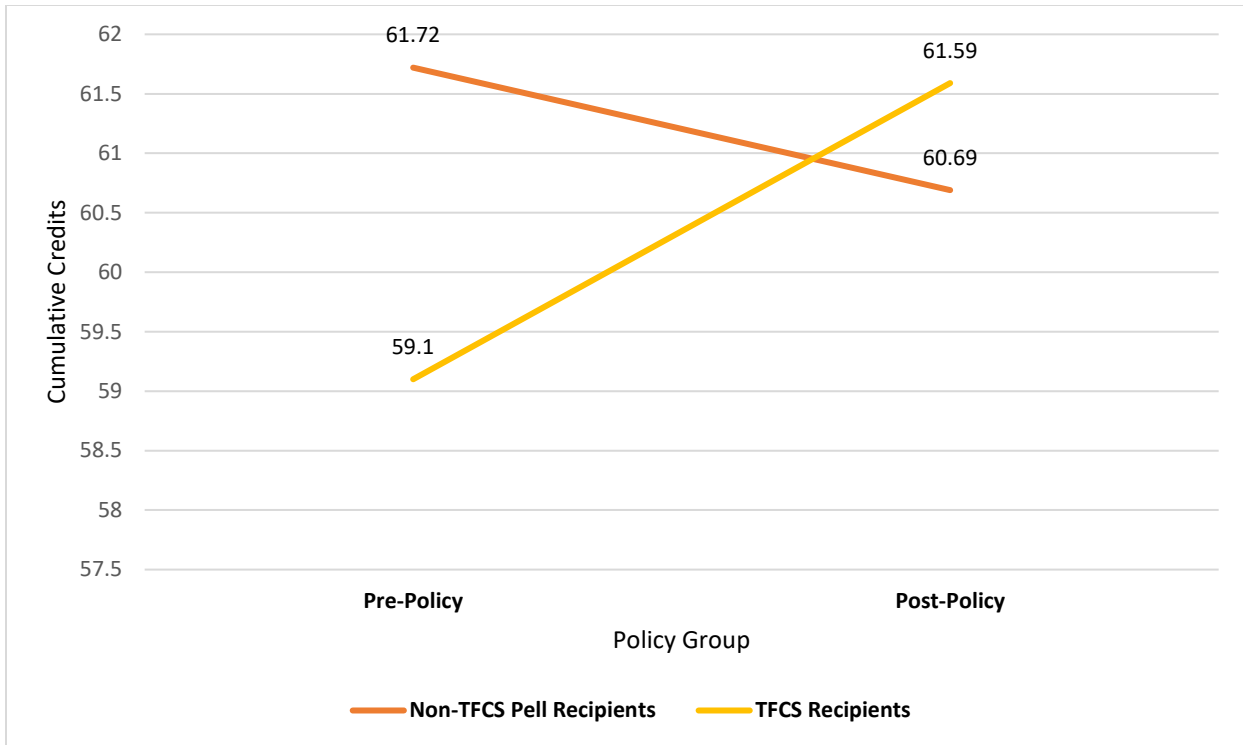


Figure 4. Marginal mean estimates of pre- and post-policy group on Year 2 Cumulative Credits (significant effects) at Indiana University Bloomington, by Award Recipients

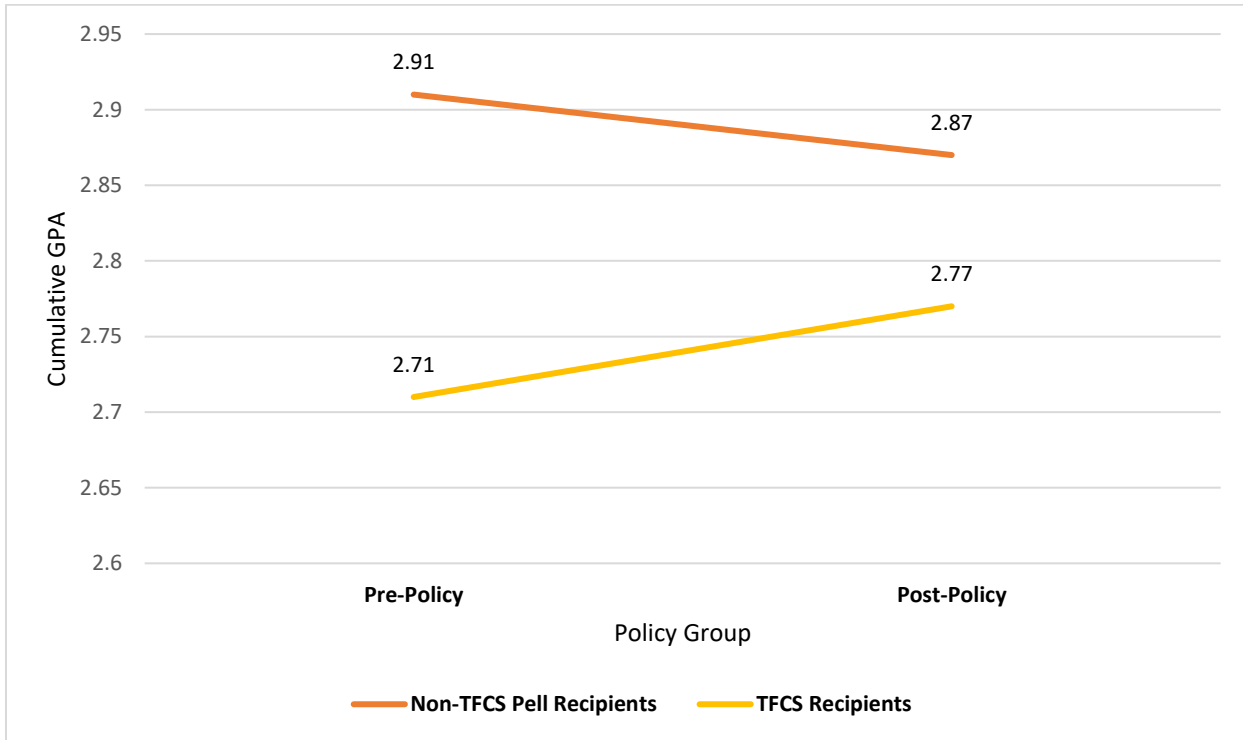


Figure 5. Marginal Mean Estimates of Pre- and Post-Policy Group on Year 1 Cumulative GPA (significant effects) at Indiana University Bloomington, by Award Recipients

In summary, the DiD and logistic regression results showed that the implementation of the 30-credit hour annual completion policy was positively associated with the continuous outcome variables at IUB but not at IUPUI. The results also revealed that the 30-credit hour annual completion policy neither improved on-time graduation nor delayed graduation component at both IUB and IUPUI, suggesting that the *15 to Finish* initiative did not necessarily helped low-income students.

Test of ANOVA Means

Research Question 2: To what extent are any of the identified policy effects moderated by demographic factors (race, gender, generation) and pre-college characteristics (high school GPA, SAT Score), that is, to what extent does the policy appear to have differential effects for various types of students?

Because the DiD analyses reveals policy effects only among IUB students for the Year 1 Cumulative Credits, Year 2 Cumulative Credits, and Year 1 Cumulative GPA outcomes, ANOVA was used to test for interactions between the policy and the covariates noted earlier in Chapter 3. Tables 16 through Table 20 show the results for the three demographic factor variables - Gender, Generation Status, and Race/Ethnicity – and the two pre-college characteristic variables, High School GPA and SAT Score. Marginal mean estimates were drawn for any demographic factor and pre-college characteristic variables with significant interaction effects at IUB (see Figure 6 through Figure 11).

Demographic Factors

For Gender, there were statistically significant main effects as well as time interaction effects for all three of the continuous academic progress facts for which the DiD analyses showed a policy effect (see Table 16). Figure 6 through 9 illustrate these effects and show a

similar pattern. Specifically, female Pre-Policy TFCS recipients averaged higher credits (both year 1 and year 2) and Year 1 GPA than their male counterparts, and this difference grows even larger after the policy went into effect. In fact, it appears that the positive time effect revealed in the DiD analyses is primarily among female students. Male students appear to have been slightly negatively impacted, although this analysis does not reveal if the slight declines among males is statistically significant.

For Generation Status, Table 17 shows that there was a significant interaction effect only for Year 1 Cumulative GPA. This effect is illustrated in Figure 9 showing that the time appears to have had a positive effect for first-generation college students but a slight negative effect for continuing generation students. The difference in Year 1 Cumulative GPA between first generation and continuing-generation students is reduced by more than half from a marginal estimate of 0.16 (2.88 vs. 2.72) for the pre-policy cohorts, to a difference of 0.07 (2.85 vs. 2.78) for the post-policy cohorts.

Table 16

*Test of Gender as Moderator of Policy Effect on TFCS Students at Indiana University
Bloomington*

Source	Sum of Squares	df	Mean Square	F	p
Year 1 Cumulative Credits					
Time	405.462	1	405.462	3.781	0.055
Gender	5298.724	1	5298.724	49.410	0.001***
Time × Gender	541.480	1	541.480	5.049	0.025**
Residual	456947.735	4261	107.240		
Year 2 Cumulative Credits					
Time	332.599	1	332.599	0.898	0.343
Gender	18047.265	1	18047.265	48.712	0.001***
Time × Gender	1731.981	1	1731.981	4.675	0.031*
Residual	1.579e +6	4261	370.492		
Year 1 Cumulative GPA					
Time	0.007	1	0.007	0.013	0.910
Gender	40.298	1	40.298	69.916	0.001***
Time × Gender	4.132	1	4.132	7.174	0.007**
Residual	2454.380	4261	0.576		

* $p < .05$, ** $p < .01$, *** $p < .001$

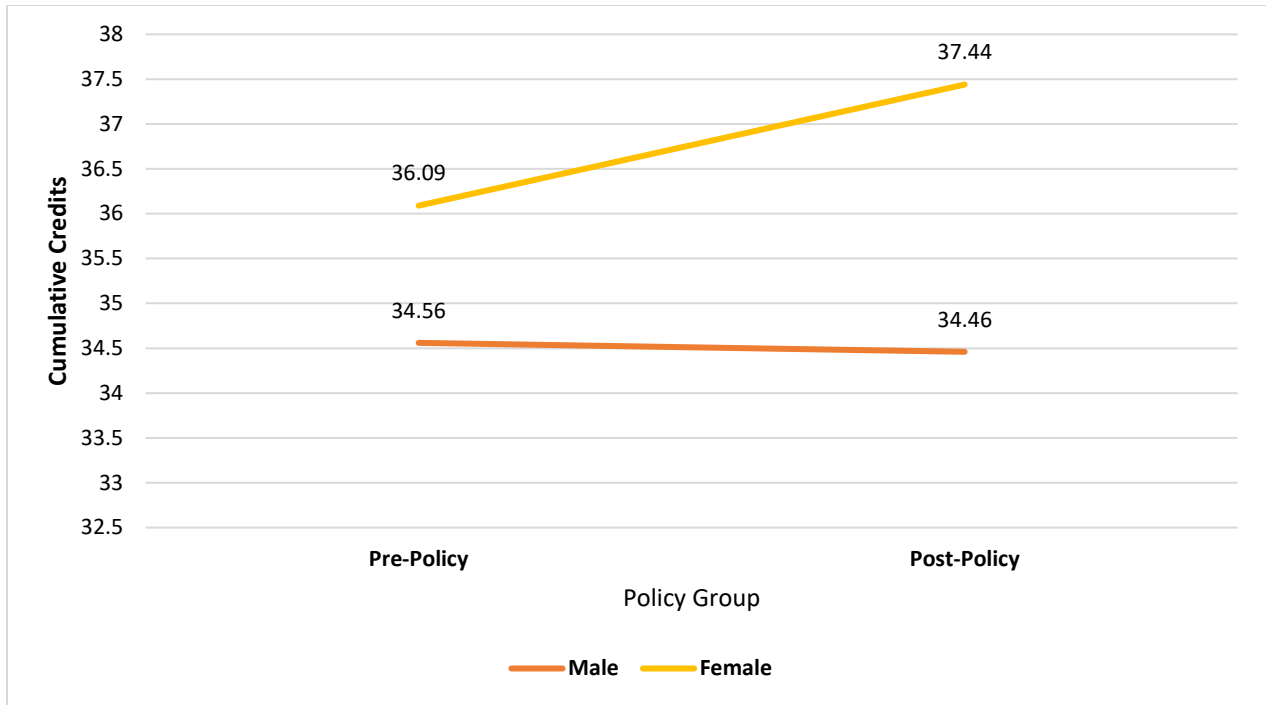


Figure 6. Marginal mean estimates of pre- and post-policy group on Year 1 Cumulative Credits (significant effects) at Indiana University Bloomington, by Gender

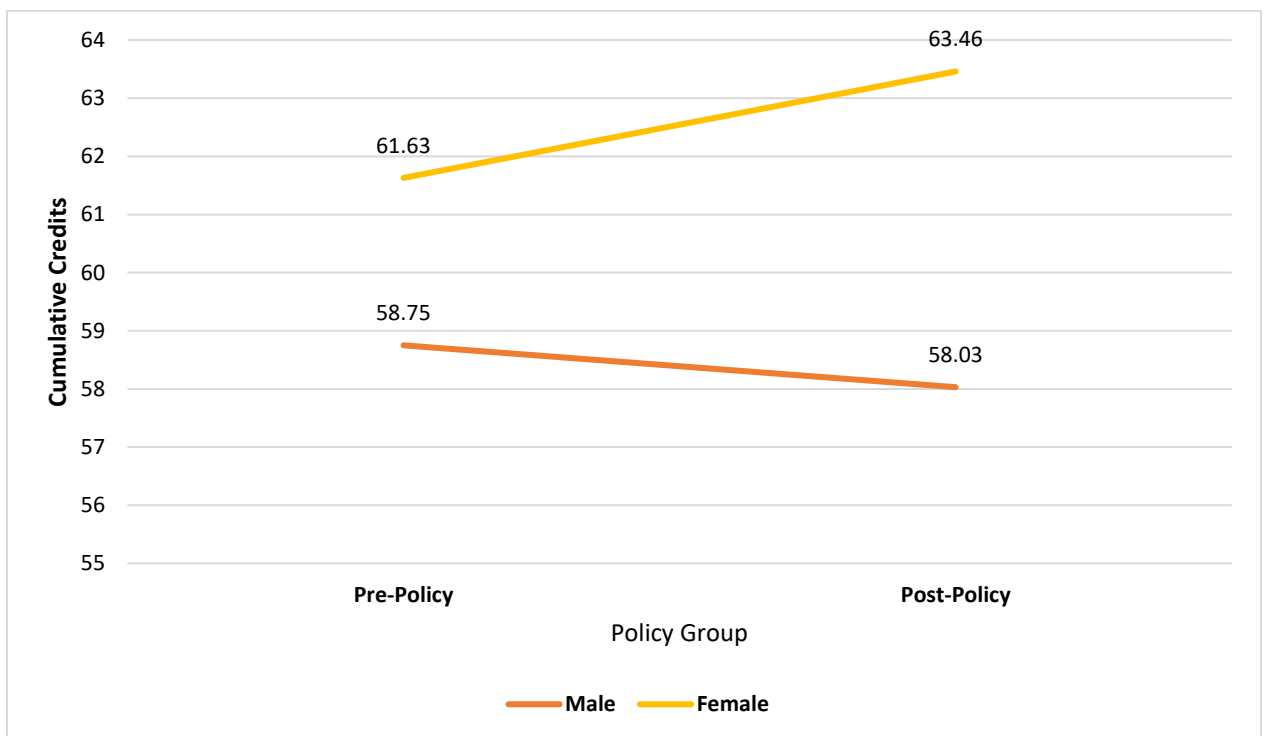


Figure 7. Marginal mean estimates of pre- and post-policy group on Year 2 Cumulative Credits (significant effects) at Indiana University Bloomington, by Gender

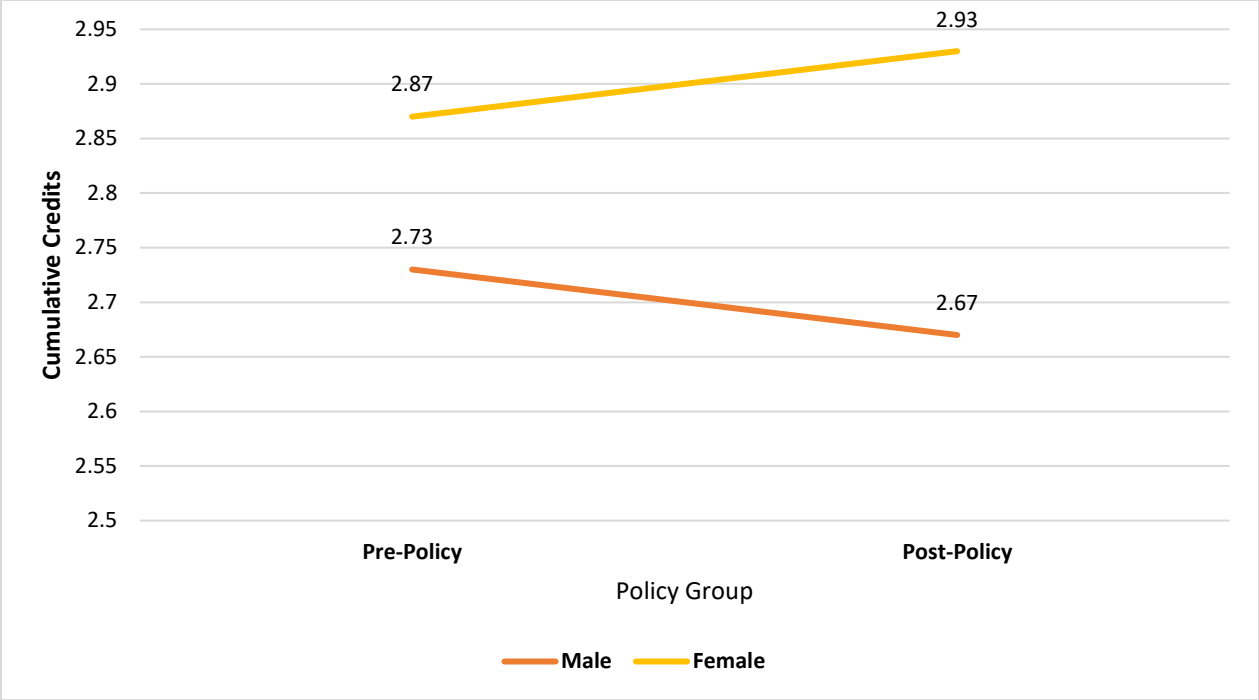


Figure 8. Marginal mean estimates of pre- and post-policy group on Year 1 Cumulative GPA (significant effects) at Indiana University Bloomington, by Gender

Table 17

Test of Generation Status as Moderator of Policy Effect on TFCS Students at Indiana University Bloomington

Source	Sum of Squares	df	Mean Square	F	p
Year 1 Cumulative Credits					
Time	633.557	1	633.557	5.840	0.016**
Generation	547.021	1	547.021	5.043	0.025**
Time× Generation	309.321	1	309.321	2.851	0.091
Residual	462226.455	4261	108.478		
Year 2 Cumulative Credits					
Time	741.578	1	741.578	1.982	0.159
Generation	4178.084	1	4178.084	11.168	0.001***
Time× Generation	1199.007	1	1199.007	3.205	0.073
Residual	1.594e +6	4261	374.124		
Year 1 Cumulative GPA					
Time	0.241	1	0.241	0.413	0.521
Generation	14.186	1	14.186	24.326	0.001***
Time× Generation	2.230	1	2.230	3.824	0.050*
Residual	2484.909	4261	0.583		

* $p < .05$, ** $p < .01$, *** $p < .001$

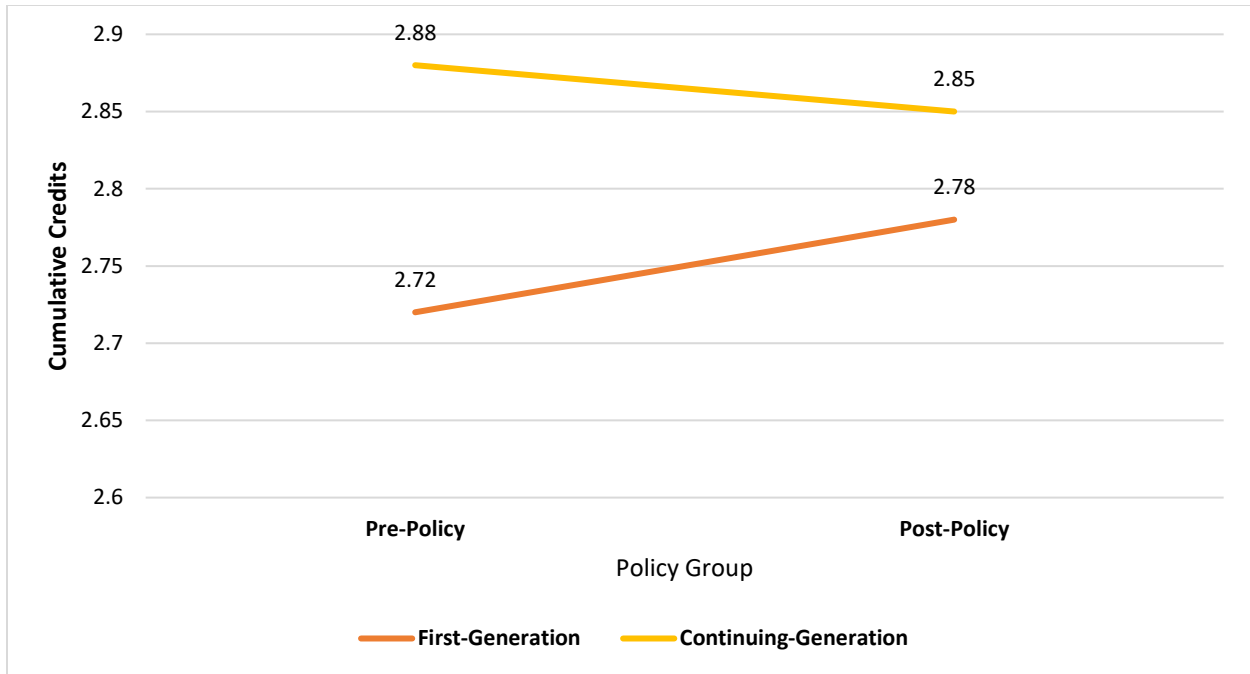


Figure 9. Marginal mean estimates of pre- and post-policy group on Year 1 Cumulative GPA (significant effects) at Indiana University Bloomington, by Generation Status

Table 18 shows that there were no significant interactions between race/ethnicity and the time effects of the IUB TFCS recipients.

Table 18

Test of Race as Moderator of Policy Effect on TFCS Students at Indiana University Bloomington

Source	Sum of Squares	df	Mean Square	F	p
Year 1 Cumulative Credits					
Time	107.085	1	107.085	1.003	0.317
Race	8189.961	6	1364.994	12.788	0.001***
Time× Race	991.193	5	198.239	1.857	0.098
Residual	453852.705	4252	106.739		
Year 2 Cumulative Credits					
Time	70.235	1	70.235	0.191	0.662
Race	28848.213	5	5769.643	15.686	0.001***
Time× Race	2479.026	4	619.756	1.685	0.151
Residual	1545947.294	4203	367.820		
Year 1 Cumulative GPA					
Time	0.051	1	0.051	0.091	0.763
Race	101.691	5	20.338	36.354	0.001***
Time× Race	2.427	4	0.607	1.084	0.362
Residual	2351.376	4203	0.559		

* $p < .05$, ** $p < .01$, *** $p < .001$

In summary, there was a positive significant effect for certain student groups at IUB. Specifically, Female students consistently benefited from the 30-credit hour completion policy during the post-policy period for all three academic progress variables at IUB (36.09 credits to 37.44 credits; 61.63 credits to 63.46 credits; 2.87 GPA to 2.93 GPA), suggesting that the *15 to Finish* initiative helped women achieve its intended goal of increasing cumulative credit hour accumulation (nearly 2-3 credits) and improving student grades (0.05 GPA increase). In addition, first-generation students slightly improved their academic performance (2.72 GPA to 2.78 GPA)

during the post-policy period at IUB, compared to continuing-generation students (2.88 GPA to 2.85 GPA).

The confidence interval and standard error table of these marginal mean can be found in Appendix I and Appendix J.

Pre-College Characteristics

Because ANOVA cannot be used to test for an interaction between a factor (Time) and a continuous covariate, a simple linear regression was used to predict the academic progress variables based on the continuous variables. Interaction variables were created (High School GPA \times Time, and SAT Score \times Time) to explore whether these factors moderated the impact of the policy on the three academic outcome variables. The coefficient of the interaction reveals whether High School GPA and SAT Score affects the impact of the policy on these outcomes among the IUB TFCS recipients

Table 19 shows that the interaction effect (High School GPA \times Time) was significant for Year 1 Cumulative Credits Completed and Year 1 Cumulative GPA, but not for Year 2 Cumulative Credits. Figures 10 and 11 illustrate this interaction by showing the predicted Year 1 Cumulative Credits and Year 1 Cumulative GPA for different levels of High School GPA. For both outcome variables, it appears that the Policy had a less favorable effect for students with very low High School GPAs. For the Year 1 Cumulative GPA outcome, there also appears to be a less favorable effect for the highest High School GPA students who are TFCS recipients at IU Bloomington. The standardized residuals for Year 1 Cumulative Credits and Year 1 Cumulative GPA on High School GPA are provided in Appendix K.

Table 19

*Test of High School GPA as Moderator of Policy Effect on TFCS Students at Indiana University
Bloomington*

Source	<i>Unstandardized</i>	<i>Standard Error</i>	<i>Standardized</i>	<i>t</i>	<i>p</i>
Year 1 Cumulative Credits					
Time	-6.345	2.879	-0.304	-2.204	0.028*
High School GPA	10.281	0.572	0.362	17.984	0.001***
Time× High School GPA	1.834	0.805	0.318	2.279	0.023*
Year 2 Cumulative Credits					
Time	-5.845	5.364	-0.151	-1.090	0.276
High School GPA	19.969	1.065	0.378	18.747	0.001***
Policy × High School GPA	1.571	1.499	0.147	1.048	0.295
Year 1 Cumulative GPA					
Time	-0.593	0.196	-0.386	-3.021	0.003**
High School GPA	1.017	0.039	0.488	26.112	0.001***
Time× High School GPA	0.155	0.055	0.366	2.824	0.005**

* $p < .05$, ** $p < .01$, *** $p < .001$

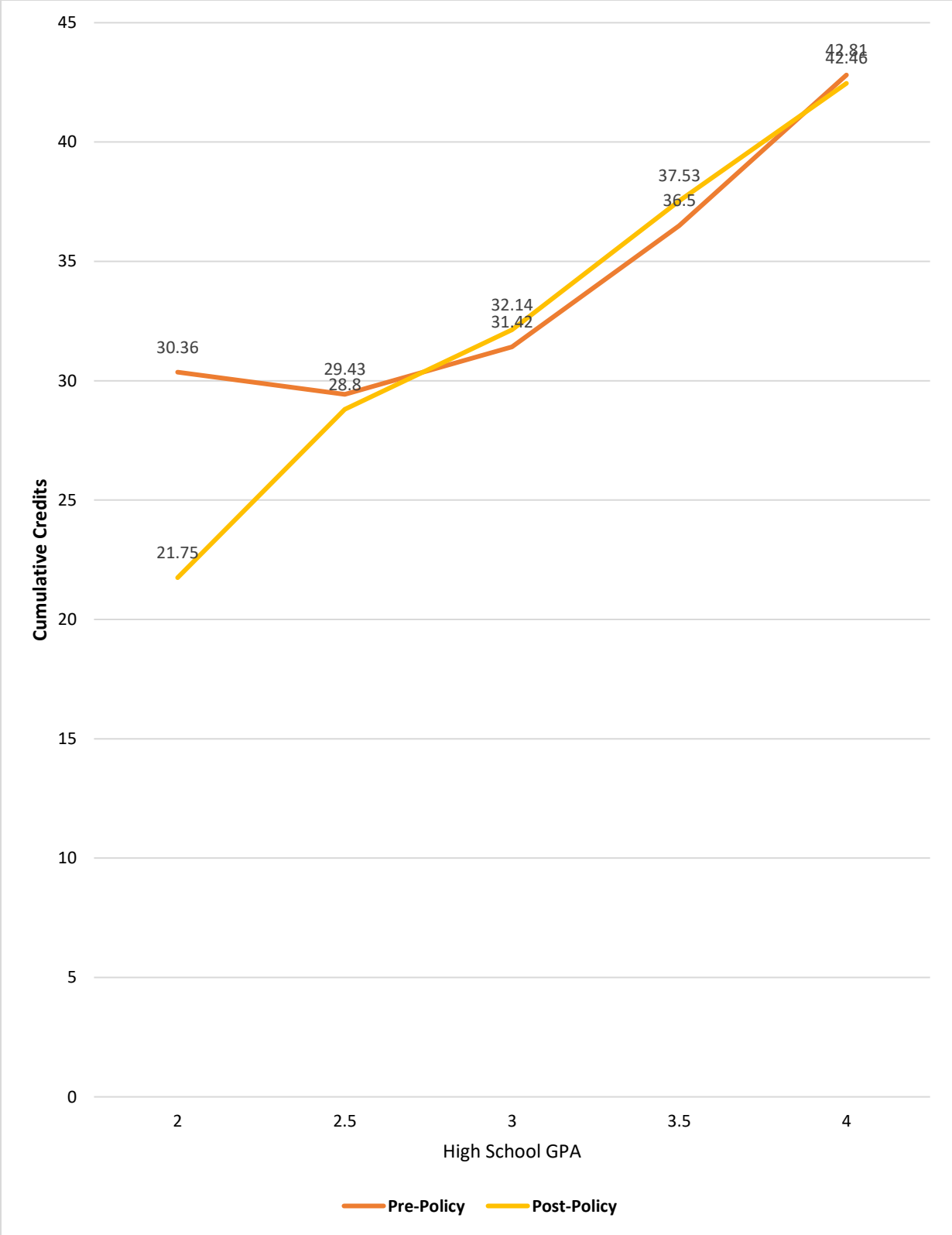


Figure 10. Marginal mean estimates of pre- and post-policy group on Year 1 Cumulative Credits (significant effects) at Indiana University Bloomington, by High School GPA

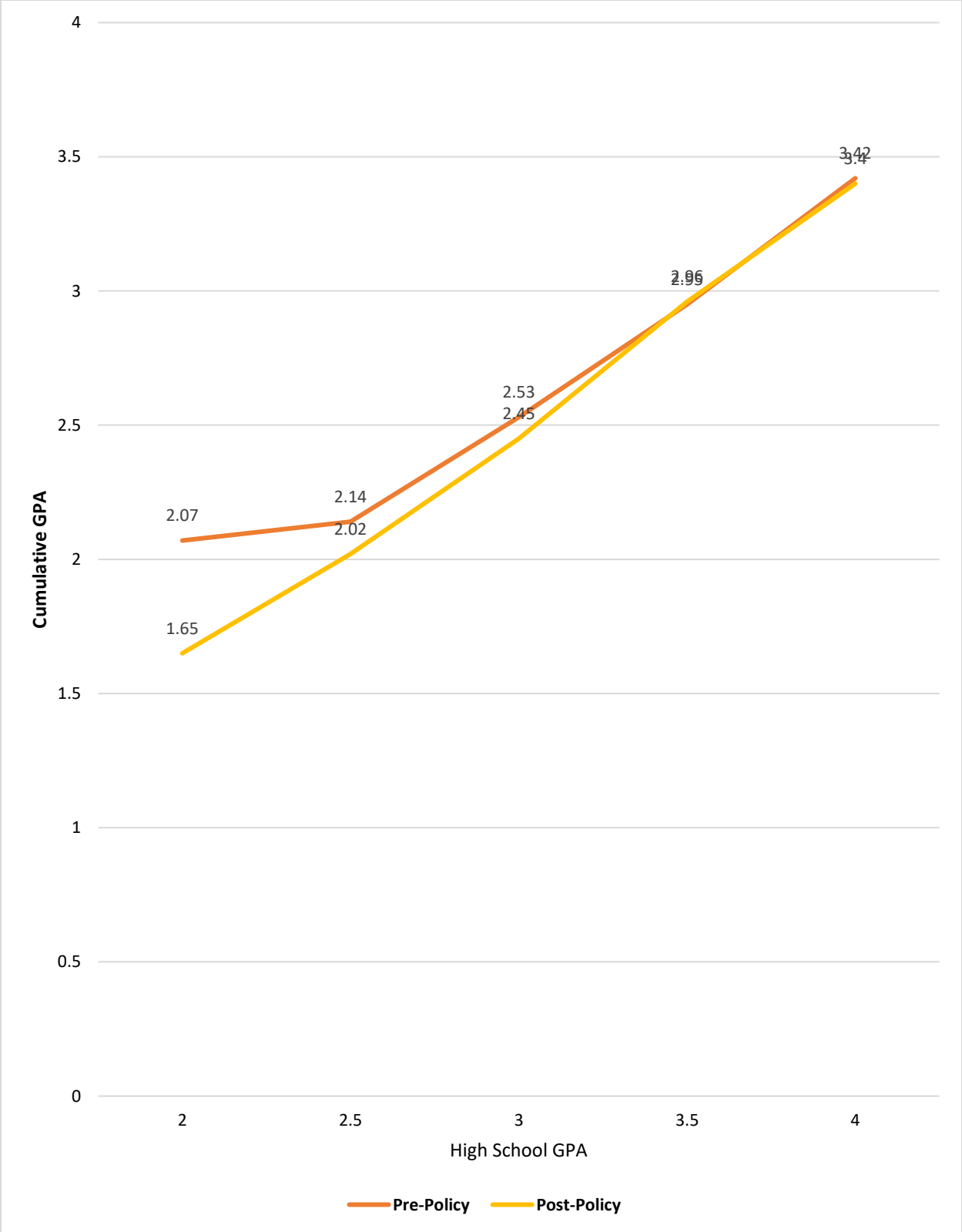


Figure 11. Marginal mean estimates of pre- and post-policy group on Year 1 Cumulative GPA (significant effects) at Indiana University Bloomington, by High School GPA

As illustrated, low-income students with higher grades benefited more from the 30-credit hour annual policy at IUB in terms of Year 1 Cumulative Credits Completed and Year 1 Cumulative GPA. Specifically, students with higher High School GPA appears to have been positively impacted with the policy implementation, whereas students with lower High School GPA appears to have been negatively impacted on this outcome. Students with at least an above average high school grades (3.00 or higher) are more likely to complete higher number of college coursework and earn better grades, compared to those with lower high school grades (2.99 or below). That is, High School GPA appear to be associated with the cumulative academic progress variables when accounting for Time groups. The standardized residuals for Year 1 Cumulative Credits and Year 1 Cumulative GPA on High School GPA are visually displayed in Appendix K.

The tests for interaction effects related to SAT (or ACT equivalent) score revealed no significant interaction effects as shown in Table 20.

Table 20

*Test of SAT Score as Moderator of Policy Effect on TFCS Students at Indiana University
Bloomington*

Source	<i>Unstandardized</i>	<i>Standard Error</i>	<i>Standardized</i>	<i>t</i>	<i>p</i>
Year 1 Cumulative Credits					
Time	2.857	2.827	0.137	1.011	0.312
SAT Score	0.018	0.002	0.229	10.695	0.001***
Policy × SAT Score	-0.002	0.002	-0.116	-0.846	0.398
Year 2 Cumulative Credits					
Time	9.179	5.290	0.237	1.735	0.083
SAT Score	0.031	0.003	0.208	9.659	0.001***
Time× SAT Score	-0.007	0.004	-0.231	-1.671	0.095
Year 1 Cumulative GPA					
Time	0.127	0.205	0.082	0.616	0.538
SAT Score	0.002	1.233	0.272	12.834	0.001***
Time× SAT Score	-1.137	1.727	-0.089	-0.659	0.510

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 21 provides the overall summary of findings as discussed throughout Chapter 4.

Table 21

Overall Summary of Findings with Covariates at Indiana University Bloomington

Interaction Effects Variable	Year 1 Cumulative Credits Completed	Year 2 Cumulative Credits Completed	Year 1 Cumulative GPA	Year 4 Graduation Status	Year 6 Graduation /Enrollment Status
	<i>p</i>	<i>p</i>	<i>p</i>	<i>p</i>	<i>p</i>
Time × Group	***	**	*	ns	ns
Time × Gender	**	*	**	-	-
Time × Generation	ns	ns	*	-	-
Time × Race	ns	ns	ns	-	-
Time × High School GPA	*	ns	**	-	-
Time × SAT Score	ns	ns	ns	-	-

Summary

Colleges and universities are facing increased pressure from policymakers to improve college progression and completion of low-income, first-generation students. This study evaluated one approach of using credit hour completion requirements to encourage students for timely graduation. The analyses illustrated that the 30-credit hour annual completion policy, implemented by the State of Indiana and supported by the Complete College America (CCA), appear to have a positive impact for certain academic progress variables at IUB, and for more so for certain types of students, but not at IUPUI. This study also finds evidence that the 30-credit hour annual completion policy, regardless of institutional type, did not significantly impact timely graduation and delayed graduation within this college promise program.

Chapter 5 discusses emerging themes from the research questions and offer policy implications for policymakers and higher education leaders.

CHAPTER 5: DISCUSSION AND CONCLUSION

This final chapter summarizes the main findings for the two research questions and discusses the study's contributions to the scholarly literature and the findings for higher education practice. The chapter concludes with some implications of the results and future research opportunities to enhance college progression and completion of low-income, first-generation students.

Discussion of Findings by Research Question

The purpose of this study was to evaluate the effectiveness of the 30-credit hour annual completion policy (*15 to Finish*) in achieving its intended objective, namely, improved progression and degree completion rates of low-income, first-generation students at two 4-year public research universities in Indiana. To that end, the study asked the following two research questions:

Research Question 1: To what extent did the 30-credit hour annual completion policy (*15 to Finish*) achieve its intended effects: increasing credit accumulation, improving student progress and increasing graduation rates?

Research Question 2: To what extent are any of the identified policy effects moderated by demographic factors (race, gender, generation) and pre-college characteristics (high school GPA, SAT Score), that is, to what extent does the policy appear to have differential effects for various types of students?

The first research question explored whether there are significant differences in the cumulative credits completed, cumulative GPA, and Year 4 and Year 6 Graduation/Enrollment status between TFCS recipients in the pre-policy cohort and TFCS recipients in the post-policy cohort, both compared to non-TFCS Pell recipients. The results of the difference-in-differences (DiD)

analysis suggests that the 30-credit hour annual completion policy produced modest, positive, statistically significant impact estimates – the estimated change in outcomes caused by the policy, measured by the difference between the treatment and control group outcomes – on credit hour accumulation and cumulative GPA for IUB TFCS recipients but did not for IUPUI TFCS recipients. Specifically, the analyses pool four academic years from the Indiana TFCS at IUB and IUPUI, and found that IUB TFCS recipients who were subject to the policy were more likely to complete a higher number of college credits (about 2-3 credit hour benefit), compared to IUB TFCS recipients who entered before the policy went into effect. TFCS recipients who entered IUB in Fall 2013 and Fall 2014 were accumulating credits more quickly than their counterparts who entered Fall 2011 and Fall 2012. In addition, TFCS recipients who entered IUB in the Fall 2013 and Fall 2014 were performing slightly better in their academic coursework than their peers who entered Fall 2011 and Fall 2012.

On the other hand, although there was no differential effect within the TFCS recipients group at IUPUI, changes were happening that affected their year-to-year credit hour accumulation over time (time difference), suggesting that the policy may have improved students' academic progress in Year 1 and Year 2. The lack of an interaction effect may be due to the broader efforts to decrease time to graduation at IUPUI, as discussed earlier in Chapter 1 (page 7). With this broader effort, the results at IUPUI suggest that such *15 to finish* efforts may well improve the rate of four-year degree completion but at the expense of longer-term completion. That is, cumulatively, more students graduate by year 4 but fewer, overall, by year 6.

The results of the logistic regression analysis also showed that the policy did not affect the graduation/enrollment outcomes for TFCS recipients at either campus, indicating that the *15 to*

Finish initiative neither improved timely graduation nor delayed graduation. There are many potential reasons for the non-significant interaction effect in the logistic regression analysis, including the lack of scholarship funds available for low-income students after their fourth year, in which the Indiana TFCS runs out. Furthermore, TFCS recipients who decide to delay graduation are often left out from the targeted communication and/or student support services programming provided by the IU 21st Century Scholars Program. To overcome such challenge, the IU Office of Scholarships may need to provide unrestricted emergency funds for delayed TFCS recipients who want to obtain their degrees and stay enrolled at either IUB or IUPUI. An example worth emulating is the Georgia State University's (GSU) Panther Retention Grant Program which provides micro grants to students each semester to help cover modest financial shortfalls affecting students' ability to pay tuition and fee (Renick, 2019). As a result of the GSU micro-grant program, sixty-one percent of seniors graduated within two semesters, and 82 percent were either still enrolled after one year or graduated (Higher Learning Advocates, 2019). Given the success of the program, campus leaders may want to emulate such program at IUB or IUPUI to improve college completion and time to degree rates for low-income, first-generation students. Policymakers and practitioners could look to existing programs such as Title III, Part A, or the Supplemental Educational Opportunity Grant (SEOG) program for existing resources that may be allocated toward micro-grants.

The second research question focused on how the policy change affected different types of students. This was explored only for the outcomes that the policy affected (cumulative credit hours completed and cumulative GPA) and the campus affected, IU Bloomington. Specifically, the analysis compares TFCS recipients in the pre-policy cohort to TFCS recipients in the post-policy cohort. The study used ANOVA to test for moderating effects of categorical correlates

(gender, race/ethnicity, generation status), and regression for moderating effects of continuous correlates (high school GPA, SAT/ACT score) on the academic progress outcomes. The ANOVA models showed a significant interaction effect for Gender and Generation Status when accounting for Policy groups. Specifically, the Gender effect suggest that TFCS female recipients responded positively to the *15 to Finish* policy change for all three outcome variables, whereas males did not. A relatively weak significant interaction effect was found for Generation Status on Year 1 Cumulative GPA, suggesting IUB TFCS first-generation recipients responded positively on these outcomes to the 30-credit hour annual policy change, whereas their continuing-generation TFCS peers responded negatively. In other words, the 30-credit hour completion policy worked for a variety of low-income students, including first-generation students that traditionally perform poorly.

The Race/Ethnicity variable for which there were no significant interaction effects for the three academic outcome variables indicates that the 30-credit hour completion policy did not affect students differently by race/ethnicity at IUB (i.e., the effects were similar across racial groups). This finding is not all surprising given the fact that the number of students of color attending colleges and universities continues to rise nationwide from about 30 percent to approximately 45 percent (Espinosa, Turk, Taylor, & Chassman, 2019). Specifically, the total completion rate among those who started at a public four-year college in fall 2011 was at an all-time high for the majority of Hispanic (81.9%) and Black (72.5%) students who completed within six years (Espinosa, Turk, Taylor, & Chassman, 2019). As more students of color continue to enroll and persist on our nation's college and university campuses (Rutherford & Meier, 2020), IUB and IUPUI has implemented several initiatives since 2013 to build a

culturally engaging campus environment for all students which may explain the non-significant interaction effects for the Race/Ethnicity variable (Museus, Yi, & Saelua, 2017).

The regression analyses revealed that one of the two prior academic ability measures, high school GPA, moderated the effects of the policy, but the other, average college entry exam score (SAT or ACT) did not. The policy appears to have had an adverse effect on both the Year 1 Cumulative Credits and Year 1 Cumulative GPA of TFCS recipients high school GPAs at the low end of the distribution among the group. The 30-credit hour completion policy did not have a differential effect by college entry exam score. These findings are not all surprising given the fact that past studies have consistently shown that high school GPAs are stronger predictors than test scores of college outcomes (Bowen, Chingos, & McPherson, 2009; Hiss & Franks, 2014). Most notably, Bowen, Chingos, and McPherson (2009) found the relationship of SAT scores with college outcomes was small and sometimes not significant (depending on institution type) after controlling for high school GPAs. In contrast, high school GPAs had a strong relationship with college outcomes controlling for students' test scores. Hence, the interaction effects for high school GPA but not for SAT score as shown in Table 19 and Table 20 is consistent with past research that claim that high school GPA is a better predictor of college graduation rates than SAT/ACT score (Bowen, Chingos, & McPherson, 2009).

In summary, this dissertation found that TFCS recipient appears to have somewhat benefited from the *15 to Finish* initiative at IUB but not at IUPUI. Specifically, this empirical research does provide some evidence that the Indiana Code 21-12-6-7 has a differential policy effect for certain student groups and for certain types of institution within an early commitment, first-dollar college promise program. Consistent with earlier research by Attewell and Monaghan (2016), this study provides some evidence that tying credit hour requirements to performance-

based scholarship programs may improve persistence in the first and second-year of college at the small town, primarily residential, more selective, flagship research university (IUB) than at an urban, primarily nonresidential, moderately selective research university (IUPUI). However, this finding should be taken lightly given the broad differences of the two campuses as emphasized in Table 5 and at the beginning of Chapter 3.

Study Contributions to the Higher Education Policy and Practice

This research contributes to the empirical literature on state policies aimed at increasing student progression and completion. Only two studies to date has explored how a statewide financial aid program (or college promise program) with specific academic performance metric requirement affects the academic outcomes of low-income, first-generation students at 4-year public research institutions (Anderson et al., 2020; Scott-Clayton, 2011). Because the proliferation of college promise program is a relatively recent phenomenon (along with the *15 to Finish* initiative), this study cannot make any direct comparisons to previous research that links both constructs to the academic outcomes of low-income, first-generation students. However, the findings of this study provide support for two primary themes that would improve higher education practice regarding student progression and academic success through graduation. The first theme focuses on the role of college promise programs with required academic performance metric in shaping students' academic progress and completion. The second theme addresses the differential effect of tuition-free degree programs on different types of students. Because the findings of this study are correlational, not causal, the themes and policy implications summarized in the following section are based on suggestive evidence.

The Role of College Promise Programs on Completion Agendas

Increased demands for accountability of colleges and universities initiated various

national efforts to increase the proportion of Americans with a high-quality credential by the year 2025 (Lumina Foundation, 2018). Rising tuition costs, however, pose a considerable challenge to these goals, particularly for low-income, first-generation students who enroll in and complete college at lower rates than their more affluent peers. The Federal Pell Grant can help, but often does not cover the full cost of higher education.

To overcome such challenge, several democratic presidential candidates - Bernie Sanders, Elizabeth Warren, and Joe Biden - have all endorsed making community college tuition-free during the 2020 U.S. presidential election to support students in completing a college education relevant to the needs of a twenty first century workforce. As the focus on college completion intensifies, the results of this study are somewhat promising: scholarship renewal requirements aimed at encouraging academic progress can help students advance toward their degrees at some types of institution. Many states and institutions have some form of a *15 to Finish* initiative supported by the Complete College America (CCA) (along with other policies, such as performance-based funding, tuition incentives) to improve the academic outcomes of postsecondary institutions, with the goal of increasing on-time graduation and completion rates. While this study found modest, positive, statistically significant estimates at IUB, this study also found that the implementation of credit hour completion policies directed at low-income, first-generation students does not appear to have attained the primary intended effect of increasing graduation outcomes or on-time completion rates. Additionally, this study showed that the policy had very modest effects on some of the academic progress variables (credits, GPA) at only one campus (IUB) and for some types of students (women, first-generation).

Consistent with earlier research, the 30-credit hour annual completion policy was found to be significant with first year progression, second year progression and first year cumulative

GPA at IUB but not at IUPUI. However, the non-significant interaction effect at IUPUI may be viewed as compensatory guided by the assumption that the *15 to Finish* policy initiative may shape academic progress and college completion status along different dimensions in different ways (Downey & Condron, 2016). For example, the 30-credit hour annual completion policy might indeed encourage some IUPUI TFCS recipients to study longer hours or to participate in group tutoring and thus improve on-time degree completion, but they also might compensate for others – increasing delayed graduation rate as a result of higher levels of financial stress to fulfill scholarship renewal requirements. That is, holistically, the *15 to Finish* policy initiative may have been effective at IUPUI in ways that are beyond the scope of this study impacting both TFCS recipients and non-TFCS Pell recipients. Ultimately, the question is not whether it is possible the *15 to Finish* policy initiative can improve college completion gaps of low-income, first-generation students; the question is whether the *15 to Finish* policy initiative is the best strategy for doing so.

Policy Implications

This study is exploratory in the realm of analyzing the effect of academic performance metric requirements on low-income, first-generation students' academic progress and completion outcomes. It employed a quasi-experimental, difference-in-differences (DiD) analysis on the academic progress variables at IUB and IUPUI, followed by a logistic regression of the binary variables on the college completion status. Afterwards, ANOVA test were conducted to test for interactions between the policy and the covariates for those with significant interaction effects. Based on the results of this study, new question arise that suggest future research (see page 116).

Using secondary administrative data to leverage a natural policy adoption experiment, this study makes additional contributions regarding the usefulness of DiD approach for assessing

such policy changes (Kelchen, Rosinger, & Ortagus, 2019). Specifically, this study builds upon Kelchen, Rosinger, and Ortagus (2019) who urge scholars of education policy to use continuous treatment variables in DiD approach to assess the effectiveness of a policy implementation in higher education. Given the rise of college promise programs across the United States, there is a need for additional research to expand upon how college promise program with credit hour completion requirements affects the equity of disadvantaged groups. The findings of this study provide Indiana policymakers useful information to consider regarding the usefulness of the 30-credit hour annual completion policy of which may penalize some types of TFCS recipients.

To prevent such negative outcomes, it is critical that college promise programs as well as institution's that create their own scholarship programs establish scholarship renewal requirements or policies to ensure that funding is distributed equitably across all groups as opposed to limiting a certain type of student. Knowing which type of students are more likely to complete 15 credit hours per semester (or 30-credit hours per academic year) and their total amount of Federal Pell Grant will allow administrators and practitioners to redirect their completion efforts to each student. Although this study did not examine the policy diffusion of the *15 to Finish* (Gandara, Rippner, & Ness, 2017), the use of annual academic performance requirements in college completion agendas is an increasingly popular, and perhaps, political strategy for state policymakers based on the general beliefs that doing so will increase the proportion of Americans with "high-quality degrees, certificates and other credentials" (Lumina Foundation, 2018). These policies or initiatives may serve a symbolic purpose by giving the appearance that the legislature and higher education commission are pursuing an aggressive strategy that people believe will work despite any clear evidence (Bell, 2020). Nonetheless, findings from this research provide some tangible, if limited in context, evidence as to whether

required academic performance progress requirements affect students' academic outcomes, or if there are other unintended consequences that impact all or some types of students.

Recommendations

This study provides insights into the effectiveness associated with the implementation of a *15 to Finish* policy initiative on college promise programs. The Complete College America (CCA) has a variety of interests regarding student success, but the implementation of the *15 to Finish* initiative across the United States is one of, if not their most visible key strategies. The study suggests that the likelihood of positive outcomes associated with Indiana's TFCS *15 to Finish* policy initiative depend on both institutional and student characteristics.

The insights from this study extend beyond *15 to Finish* initiatives and highlight the broader effects of required academic progress policies on student progression and completion. Since on-time completion rate is part of the State of Indiana's performance-based funding metrics (Favero & Rutherford, 2019), it is wise for state colleges and universities to closely monitor the academic progress of at-risk students and intervene as early as possible. The findings of this study suggest that policymakers and practitioners at the state and institutional levels reconsider how they embed or enact *15 to Finish* initiatives aimed at ensuring timely completion as well as other attainment goals of the state. This study does not, however, suggest that all colleges and universities should implement credit hour completion requirements to encourage performance. The findings do suggest, however, the possibilities for restructuring college promise programs, and any additional federal aid that might be provided in the future.

Those who craft policy for college promise programs should consider the following questions and influences regarding *15 to Finish* initiatives:

1. What role is the *15 to Finish* policy initiative supposed to play in college promise programs, and more broadly, scholarship eligibility and renewal?
2. When was the last time the *15 to Finish* policy initiative was evaluated?
3. How does the *15 to Finish* policy initiative relate to the institution larger goals for student success?
4. Given the national interest in college retention and completion, especially for underrepresented groups, to what extent is the *15 to Finish* policy initiative advancing those goals, and what can be conducted to improve the *15 to Finish* policy initiative in college promise programs?
5. How can college promise programs reinforce the *15 to Finish* policy initiative around timely graduation?

The 30-credit hour annual completion policy requires academic and student support services to work together to prevent any intended or unintended consequences that could delay academic progression. Higher education leaders may want to consider establishing an annual review of the effectiveness of the 30-credit hour completion policy to ensure the overall success of their students. Students in the Frank O'Bannon program, for example can earn an additional \$1,300 in aid if they complete 30 credits annually after an annual review by the Indiana Commission for Higher Education (ICHE, 2020).

A few discussion questions for policymakers and practitioners about the *15 to Finish* initiative is provided Appendix G.

Recommendations for Future Research

Rising tuition costs and decreasing state appropriations will continue to impact the future of college promise programs (and debt free college proposals) across the United States, with

some critics arguing that college promise programs may reduce the number of bachelorette degree recipients over time (Avery et al., 2019). Given that the concept of college promise programs and the *15 to Finish* initiative is still new to the field of higher education and student affairs, future research should be done to expand upon the findings of this study (Perna & Smith, 2020). One clear area of need for future research is to extend this type of study, examining the impact of such policy changes on college promise program participants to different types of institutions (e.g., doctoral institutions vs. community college institutions; minority-serving institution vs. predominately White institution; for-profit vs. non-profit; public vs. private; distance education vs. in-person) (Swanson, Watson, & Ritter, 2020). In addition, future research should explore the impact of the *15 to Finish* policy initiative on other types of students (e.g., adult students, military and public safety-affiliated students, rural students, single parent students, career and technical education students) and other factors (e.g., intensity of employment, percentage of Pell recipients) (Custer & Akaeze, 2019).

While the findings of this study successfully utilized comparison groups to estimate treatment effects for students exposed to some policy change and then subtract these differences from the control group (pre-policy), there are some limitations to the overall study design regarding the use of DiD in higher education research. Specifically, this study did not take into account to the important advances in DiD when reporting interaction effects with the marginal effect chart since the publication of Brambor, Clark, and Golder (2006). Notably, this study did not take into consideration that these models assume a linear interaction effect that changes at a constant rate with the moderator (Hainmueller, Mummolo, & Xu, 2019). Additionally, this dissertation ignored the fact that estimating the conditional effects of the independent variable at all values of the moderator requires sufficient common support (Hainmueller, Mummolo, & Xu,

2019). In other words, the methodological understanding of DiD is continually changing as scholars find additional spaces for bias to be introduced or remain in the estimates. Higher education scholars and policymakers may want to replicate this study by using a combination of both DiD and other quantitative techniques such as, regression discontinuity design (RDD), propensity score matching (PSM), event history analysis, latent class analysis (LCA), or machine learning (ML) techniques to ensure that the interaction effects are at best highly model dependent (Delaney & Leigh, 2020). By doing so, scholars can better assess the validity of these assumptions and offer flexible estimation strategies that allow for nonlinear interaction effects against excessive extrapolation. Additionally, future study can also take into consideration cumulative credits attempted (i.e., students who have completed a class but earned an “F” or “W”) which was not included in this study.

Conclusion

This empirical research took the first step in investigating the impact of 30-credit hour annual completion policy on students’ academic outcomes and demonstrated the modest positive effects of the policy for some in-process measures (credits and GPA) among some types of students (women and first-generation) at IUB but not at IUPUI. However, the study and its limitations discussed earlier raised some questions for future research opportunities. The effect of the 30-credit hour annual completion policy on other types of institution (community college, for-profit college) is still unknown, given that the *15 to Finish* initiative was launched in Fall 2013. In addition, the effect of the 30-credit hour completion policy is somewhat unclear for all types of students, as the study did not provide evidence as to why the policy had no effect for TFCS males. In addition, the study did not account for those who transferred to IUB or IUPUI

during the spring semester. However, the study assumes that the effect is low given the fact that most TFCS recipients typically enroll immediately in the fall semester after high school.

Second, this study did not examine non-traditional students (adult learners), given the recent rise of college promise programs designed for these populations (Bell, 2019; Carlson et al., 2016). Presently, there are ten states that have either created or piloted adult college promise programs: Arizona, Indiana, Maine, Minnesota, Oklahoma, Rhode Island, Tennessee, Texas, Washington, and Wyoming (Carlson & Laderman, 2018). In Indiana, for example, 19,000 adults have enrolled in the You Can. Go Back. Program²¹. Adult students are becoming more diverse in backgrounds than traditional students. They are older, more likely to be enrolled part-time, and more likely a member of a racial minority group. Many are employed full-time and have family responsibilities outside of higher education that prevents them from graduating when compared to traditional students. To make matters worse, adult students also are more likely to delay graduation and take additional credits that do not lead to a degree or credential. For these reasons, future research is necessary to examine how the 30-credit hour annual completion policy for adult students impacts their academic progression and completion rates. A follow-up study should explore whether such completion requirements for adult students who receives a promise program will have increased college completion and time-to-degree rate.

The Indiana legislature implemented the 30-credit hour annual completion policy for TFCS recipients in Fall 2013 to improve the efficiency of degree production (ICHE, 2020). Although 6 academic years have passed since the introduction, the effectiveness of the policy is still in its infancy. It was the author's concern that the 30-credit hour annual completion policy

²¹ Enacted by the 2015 Indiana General Assembly, You Can. Go Back. is a statewide campaign that aims to help the 750,000+ Hoosier adults with some college but no degree finish what they started. The ICHE offers the Adult Student Grant to assist starting or completing an associate's degree, bachelor's degree, or certificates by providing a \$2,000 grant.

among TFCS recipients either increases the academic pressure and on-time completion for low-income, first-generation students or merely decreases timely graduation rates. This dissertation served as a much-needed policy evaluation and found that the *15 to Finish* initiative show modest positive effects on initial progress (credits and GPA) for some types of students at IUB but, most importantly, that the policy did not improve on-time or delayed graduation rates at either IUB or IUPUI.

Although several persistence and completion strategies utilizing need-based, first-dollar scholarships exist at postsecondary institutions, empirical evidence on the effectiveness of such strategies is scarce (Anderson et al., 2020). The results from this research contribute to filling the gap in the higher education policy literature and provide future research studies to advance the understanding of the *15 to Finish* initiative. It is not an easy task to set credit hour completion requirements in college promise programs that is equitable for all types of students. In addition, the increased diversity in student population across the United States makes the *15 to Finish* initiative more challenging, as there's no one size fit all solution. To ensure that students attain their degrees, policymakers and practitioners must make student success the number one goal in college promise programs. They must advocate for the evaluation of policies and practices impacting students and their outcomes after adoption of any significant new policy. The success of policy development and implementation is highly dependent upon the intersection of policies, people, and places (Chan, 2019; Honig, 2006). New regulations and statutes being created at the federal and state levels must be designed to help all students reach their academic and career goals, regardless of their background (gender, age, race, generation, religion, disability, socioeconomic status).

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APPENDICES

Appendix A

**ALL INDIANA COLLEGES AND UNVIERSITIES: 2017-2018 ACADEMIC YEAR
INDIANA TWENTY-FIRST CENTURY SCHOLARS (TFCS) PROGRAM, BY UNIQUE
COUNT AND TOTAL DOLLARS**

Institution	By Count	By Dollars
American National University -- South Bend	-	\$0
Ancilla College	12	\$89,911
Anderson University	53	\$409,000
Ball State University	2,209	\$20,303,903
Bethel College	49	\$372,190
Brown Mackie College – Fort Wayne	-	\$0
Brown Mackie College – Indianapolis	2	\$4,496
Brown Mackie College – Merrillville	-	\$0
Brown Mackie College – South Bend	-	\$0
Butler University	59	\$462,170
Calumet College of St. Joseph	4	\$32,720
Chamberlain University -- Indianapolis	3	\$8,512
Crossroads Bible College	5	\$31,832
DePauw University	31	\$241,311
DeVry University -- Merrillville	1	\$1,582
Earlham College	20	\$151,470
Fortis College	5	\$10,357
Franklin College	75	\$584,940
Goshen College	42	\$323,110
Grace College	68	\$533,816
Hanover College	52	\$409,000
Harrison College -- Anderson	3	\$5,310
Harrison College -- Columbus	2	\$6,384
Harrison College -- Evansville	6	\$18,089
Harrison College -- Fort Wayne	2	\$3,760
Harrison College -- Indianapolis	3	\$7,216
Harrison College -- Indianapolis East	6	\$17,293
Harrison College -- Indianapolis Northwest	9	\$23,617
Harrison College -- Lafayette	1	\$1,064
Harrison College -- Terre Haute	1	\$4,256
Holy Cross College	13	\$98,160
Huntington University	38	\$302,660
Indiana Institute of Technology	52	\$338,550
Indiana State University	1,832	\$14,992,099
Indiana University Bloomington	3,101	\$30,560,138
Indiana University East	324	\$2,021,682
Indiana University Kokomo	394	\$2,567,333

Indiana University Northwest	292	\$1,891,926
Indiana University South Bend	619	\$3,958,478
Indiana University Southeast	419	\$2,727,320
Indiana University--Purdue University Columbus	238	\$1,848,538
Indiana University--Purdue University Indianapolis	2,702	\$23,068,267
Indiana Wesleyan University	200	\$1,400,412
International Business College	26	\$132,383
International Business College -- Indianapolis	49	\$192,221
Ivy Tech Community College	2,569	\$7,148,019
Lincoln College of Technology	15	\$53,200
Manchester University	75	\$589,311
Marian University	78	\$609,411
Martin University	1	\$8,180
National American University -- Indianapolis	-	\$0
Northern Kentucky University	-	\$0
Oakland City University	10	\$69,669
Purdue University Fort Wayne	963	\$6,934,205
Purdue University Northwest	553	\$3,442,864
Purdue University Northwest – Westville Campus	75	\$230,833
Purdue University West Lafayette	2,160	\$20,253,292
Rose-Hulman Institute of Technology	49	\$294,590
Saint Elizabeth School of Nursing	4	\$27,502
Saint Mary-Of-The-Woods College	41	\$306,953
Saint Mary's College	29	\$214,320
Taylor University	40	\$291,895
The Art Institute of Indianapolis	31	\$94,156
Trine University	80	\$598,028
University of Cincinnati	-	\$0
University of Evansville	47	\$364,010
University of Indianapolis	208	\$1,617,998
University of Notre Dame	15	\$122,700
University of Saint Francis	80	\$596,345
University of Southern Indiana	881	\$5,804,790
Valparaiso University	81	\$610,689
Vincennes University	518	\$2,537,755
Wabash College	34	\$268,055
WGU Indiana	47	\$186,528

SOURCE: ICHE (2019a)

Appendix B

**ALL 4-YEAR INDIANA PUBLIC COLLEGES AND UNVIERSITIES: ALL INDIANA
TWENTY-FIRST CENTURY SCHOLARS (TFCS) PROGRAM**

University	Graduation Rate (within 4 years)	Graduation Rate (within 6 years)	Scholars Who Return After their First Year (Fall 2014)	Percentage of Scholars Earning at least 30 or More Credits Per Year (Fall 2014)	Percentage of Scholars who Lost the Scholarship for Not Completing 30 or More Credits Per Year (Fall 2014)
Ball State University	35%	68%	86%	54%	46%
Indiana State University	19%	45%	78%	46%	54%
Indiana University Bloomington	49%	70%	91%	43%	57%
Indiana University East	22%	34%	66%	36%	64%
Indiana University Kokomo	7%	48%	71%	39%	41%
Indiana University Northwest	7%	35%	77%	38%	62%
Indiana University-Purdue University, Indianapolis	19%	42%	80%	45%	55%
Indiana University-Purdue	16%	28%	62%	28%	72%

University, Fort Wayne					
Indiana University South Bend	11%	40%	74%	44%	56%
Indiana University Southeast	19%	39%	73%	35%	65%
Purdue University West Lafayette	51%	75%	96%	59%	41%
Purdue University Calumet	11%	43%	79%	28%	72%
Purdue University North Central	21%	33%	85%	26%	74%
University of Southern Indiana	21%	44%	79%	34%	66%
Vincennes University	19%	33%	58%	35%	65%
<i>AVERAGE FOR ALL INDIANA 21st CENTURY SCHOLARS AT PUBLIC UNIVERSITIES</i>	22%	39%	70%	39%	59%

NOTE: Losing the Indiana TFCS does not equate to dropout. Students can still enroll at their institution but would need to take out gift aid (e.g., Federal Pell Grant, Frank O’Bannon Grant) or self-help aid (e.g., loans, work study) to cover their cost of attendance.

SOURCE: U.S. Department of Education - College Scorecard (2017); Indiana Commissioner for Higher Education (ICHE) (2017)

Appendix C

**ALL 4-YEAR INDIANA PUBLIC COLLEGES AND UNIVERSITIES: COLLEGE
COMPLETION AND COST OF ATTENDANCE**

University	Graduation Rate (within 4 years)	Graduation Rate (within 6 years)	Students Who Return After their First Year	Annual Cost of Attendance (in- state)
Ball State University	35%	60%	82%	\$15,201
Indiana State University	22%	41%	64%	\$12,143
Indiana University Bloomington	58%	77%	89%	\$15,349
Indiana University East	9%	28%	64%	\$9,263
Indiana University Kokomo	7%	29%	65%	\$9,889
Indiana University Northwest	8%	26%	66%	\$8,549
Indiana University-Purdue University, Indianapolis	15%	44%	74%	\$12,861
Indiana University-Purdue University, Fort Wayne	6%	26%	64%	\$14,961
Indiana University South Bend	5%	25%	66%	\$10,035
Indiana University Southeast	9%	28%	64%	\$9,263

Purdue University West Lafayette	42%	74%	92%	\$13,516
Purdue University Calumet	9%	32%	70%	\$11,207
Purdue University North Central	8%	25%	62%	\$9,625
University of Southern Indiana	14%	41%	71%	\$11,990
Vincennes University	25%	23%	52%	\$11,245
<i>INDIANA AVERAGE</i>	33%	55%	70%	\$11,673
<i>U.S. NATIONAL AVERAGE</i>	40%	59%	68%	\$16,300

SOURCE: U.S. Department of Education - College Scorecard (2017); The Chronicle of Higher Education College Completion (2017); U.S. Department of Education NCES IPEDS (2017)

Appendix D

LIST OF MAJOR U.S. PLACE-BASED COLLEGE PROMISE PROGRAMS

Place-Based College Promise Programs	Year	Geographic Area (Statewide, County, City, Institution)	Type of Educational Institutional Institutions (2- year colleges, 4-year colleges)
Arkadelphia Promise Program	2010	City	4-year university (any institution across the U.S.)
Buchanan Promise Program	2016	City	2-year or 4-year institution
Boston Tuition Free Plan	2016	City	2-year community college
California College Promise Program	2016	Statewide	2-year community college
Denver Scholarship Foundation	2006	City	2-year or 4-year institution
Detroit College Promise	2009	City	2-year or 4-year institution
Early College for Maine	2003	Statewide	2-year community college
El Dorado Promise Program	2007	City	4-year university (any institution across the U.S.)
Florida Bright Futures Scholarship Program	1997	County	2-year or 4-year institution
Grand Rapids Challenge Scholars	2017	City	2-year or 4-year institution
Georgia HOPE Scholarship Program	1993	Statewide	2-year or 4-year institution
Hawaii Promise	2017	Statewide	2-year community college
Hartford Promise	2015	City	2-year or 4-year institution
Illinois' Promise Program	2005	Statewide	4-year university
Kalamazoo Promise Scholarship Program	2005	City	2-year or 4-year institution
Kentucky Work Ready Scholarship Program	2016	Statewide	2-year community college
La Crosse Promise Program	2012	City	2-year or 4-year institution
Lone Star College Promise	2016	Statewide	2-year community college

Long Beach College Promise Program	2008	City	2-year community college
Minnesota College Occupational Scholarship	2015	Statewide	2-year community college
New Haven Promise Program	2010	City	2-year or 4-year institution
Oakland Promise Program	2016	City	2-year or 4-year institution
Oregon Promise	2015	Statewide	2-year community college
Peoria Promise Program	2008	City	2-year community college
Pittsburgh Promise	2007	City	2-year or 4-year institution
Richmond Promise Program	2014	City	2-year or 4-year institution
Rhode Island Promise	2015	Statewide	2-year or 4-year institution
Tennessee Promise Scholarship	2014	Statewide	2-year community college
Ventura College Promise	2006	City	2-year community college
West Virginia Promise	1999	Statewide	2-year or 4-year institution

SOURCE: University of Pennsylvania Alliance for Higher Education and Democracy (2017)
<http://www.whimsymaps.com/view/collegepromise>

Appendix E

LIST OF COLLEGE PROMISE PROGRAMS: AWARD TYPE BY STATE

State	Program	Award Type
Alabama	Alabama Student Assistance Program	Merit; Need
	Alabama Student Grant Program	Merit; Other
Alaska	Alaska Performance Scholarship	Merit
	Alaska Advantage Education Grant	Need
Arizona	Arizona Financial Aid Trust (AFAT)	Need
	Arizona LEAP/SLEAP Program	Need
Arkansas	Academic Challenge Scholarship	Merit
	Governor's Distinguished Scholars Program	Merit
California	Cal Grant A	Merit; Need
	Cal Grant B	Merit; Need
Colorado	Colorado Graduate Grant	Need
	Colorado Student Grant	Need
Connecticut	Roberta B. Willis Scholarship Program (Merit/Need)	Need
	Roberta B. Willis Scholarship Program (Need)	Need
Delaware	Delaware SEED (Student Excellence Equals Degree) Program	Merit
	University of Delaware Other State Funded Scholarships	Need
	DC Tuition Assistance Grant	Other
District of Columbia	Mayors Scholars Undergraduate Program	Need
	Florida Bright Futures Scholarship Program-FMS Awards (Florida Medallion Scholars)	Merit
Georgia	Florida Student Assistance Grant- Public	Need
	HOPE Scholarship	Merit
	Zell Miller Scholarship	Merit
Hawaii	Hawaii B Plus Scholarship	Merit; Need
	Hawaii State Student Incentive Program	Need
Idaho	Idaho Promise Category A Scholarship	Merit; Need
	Opportunity Scholarship	Merit; Need
Illinois	Minority Teacher Scholarship MTI	Merit
	Monetary Award Program	Need
Indiana	Indiana Higher Education Award & Freedom of Choice Grants (Frank O'Bannon Grant)	Need
	Twenty-First Century Scholars Program	Merit; Need
Iowa	Iowa Tuition Grant Program	Need

	Skilled Workforce Shortage Tuition Grant	Need
Kansas	Kansas Comprehensive Grant	Need
	National Guard Tuition Assistance Program	Other
Kentucky	College Access Program (CAP) Grant	Need
	Kentucky Educational Excellence Scholarship	Merit
Louisiana	Louisiana Go Grants	Need
	Taylor Opportunity Program for Students	
Maine	Doctors for Maine's Future	Other
	Maine State Grant Program	Need
	Howard P. Rawlings Educational Assistance Grant	Need
	Howard P. Rawlings Guaranteed Access Grant	Merit; Need
Massachusetts	Massachusetts Access (Cash) Grant	Need
	MASSGrant	Need
Michigan	Michigan Tuition Grant	Need
	Tuition Incentive Program	Need
Minnesota	Minnesota State Grant	Need
	Post-Secondary Child Care Grant	Need; Other
Mississippi	Mississippi Higher Education Legislative Plan (HELP)	Merit; Need
Missouri	A+ Schools Program	Merit
	Access Missouri Financial Assistance Program	Need
Montana	Governor's Postsecondary Scholarship - Merit	Merit
	Montana Tuition Assistance Program	Merit
Nebraska	Access College Early Scholarship Program	Need
Nevada	Nebraska Opportunity Grant	Need
	Governor Guinn Millennium Scholarship Program	Merit
	Nevada Student Access Grants/Scholarships	Need
New Jersey	Educational Opportunity Fund (EOF) Article III Undergraduate	Need
	Tuition Aid Grant	Need
New Mexico	Legislative Lottery Scholarship	Merit
	New Mexico Competitive Scholarship	Merit
New York	New York State World Trade Center Memorial Scholarship	Other
	Tuition Assistance Program	Need

North Carolina	Need Based Scholarship	Need
	UNC Need Based Grant	Need
North Dakota	North Dakota Academic Scholarship	Merit; Other
	North Dakota State Student Incentive Grant Program	Need
Ohio	Ohio College Opportunity Grant Program	Need
	Ohio National Guard Scholarship Program	Other
Oklahoma	Oklahoma Tuition Aid Grant	Need
	Oklahoma's Promise	Merit; Need; Other
Oregon	Oregon Opportunity Grant	Need
	Student Child Care Grant	Need; Other
Pennsylvania	Institutional Assistance Grants	Need
	Pennsylvania State Grant Program	Need
Rhode Island	Rhode Island State Grant Program	Need
South Carolina	Rhode Island State Grant Program	Need
	Legislative Incentives for Future Excellence (LIFE) Scholarship	Merit
South Dakota	Palmetto Fellows Scholarship	Merit
	South Dakota Need Based Grant Program	Need
Tennessee	South Dakota Opportunity Scholarship	Merit
	HOPE Scholarship	Merit
Texas	Tennessee Student Assistance Award	Need
	Designated Tuition- Grants	Need
Utah	Toward Excellence, Access, and Success (TEXAS) Grant Program	Merit; Need
	Regents' Scholarship	Merit; Other
Vermont	Utah Higher Education Success Stipend Program (HESSP)	Need
	Non-Degree Grant	Need; Other
Virginia	Vermont Incentive Grant	Need
	VSFAP - Virginia Commonwealth Award	Merit; Need
Washington	Need	Need
	College Bound Scholarship	Need
West Virginia	Washington State Need Grant Program	Need
	PROMISE Scholarship	Merit
Wisconsin	West Virginia Higher Education Grant Program	Merit; Need
	Wisconsin Grant- Private Nonprofit	Need
Wyoming	Wisconsin Higher Education Grant - University of Wisconsin	Need
	Hathaway Scholarship	Merit; Need

SOURCE: Education Commission of the States (2017). Retrieved 24 October 2017 at <http://statefinancialaidredesign.org/state-financial-aid-database/>

Appendix F

INDIANA UNIVERSITY: TWENTY-FIRST CENTURY SCHOLARS PROGRAM

Indiana University Bloomington (IUB)

The Indiana University Bloomington's (IUB) Twenty-First Century Scholars Program is a student support services department founded in 1993 that provides academic and career resources to enrolled full-time students who are the recipient of the Indiana TFCS at Indiana University Bloomington (IUB). The IUB Twenty-First Century Scholars Program mission is to provide high-quality student support services and experiences to help all Scholars succeed both academically and personally at IUB. IUB Twenty-First Century Scholars Program provides students with a wide array of support activities and services on-campus, including academic tutoring, peer mentoring, housing, and professional workshops such as financial aid and overseas study. All IUB TFCS recipients are paired with an IUB Twenty-First Century Scholar academic advisor. The IUB Twenty-First Century Scholars Program focuses on five key areas: a) academic performance and persistence, b) student engagement and enrichment, c) financial literacy and debt management, d) career exploration and preparation, and e) holistic student development and success. The IUB Twenty-First Century Scholars Program is administered and funded by the IUB Office of the Vice President for Diversity, Equity, and Multicultural Affairs (OVPDEMA). The IUB Twenty-First Century Scholars Program is the largest student support services department in terms of student enrollment and is ranked #1 in Indiana for the number of students receiving the Indiana TFCS award at any 4-year public or private university.

The IU Twenty-First Century Scholars Covenant, funded and administered by the IUB Office of Scholarships since 2007, is a full financial award to supplement the scholarship component of a baccalaureate degree. Specifically, the Covenant helps low-income Indiana TFCS recipients who have been admitted to and enter IUB after high school and have unmet

indirect financial need (i.e., total aid packaged for the student from all sources minus the total need) to receive additional funding while on-campus by providing grant aid to cover expenses such as room and board, meal plans, and books. The IU Twenty-First Century Scholars Covenant is calculated by the total estimated direct cost (e.g., tuition and mandatory fees) minus the Estimated Financial Contribution (EFC) and Gift Aid (e.g., Federal Pell Grant, Federal Supplemental Educational Opportunity Grant). The maximum Twenty-First Century Scholars Covenant amount is around \$7,000 per semester. IUB is the only institution in the state of Indiana to provide unmet grant aid to all incoming low-income Scholars.

Indiana University-Purdue University, Indianapolis (IUPUI)

The Indiana University-Purdue University, Indianapolis (IUPUI) Twenty-First Century Scholars Program is a student support services program for IUPUI students who accept their Twenty-First Century Scholarship (TFCS) pledge from the state of Indiana. The program strives to empower Scholars to articulate and achieve their personal, educational, and career goals by providing services, resources and support systems that promote academic success and timely graduation. The program focuses on developing key skills in a nurturing environment that increases student confidence and effort that contributes to the student success. The IUPUI Twenty-First Century Scholars Success Center offers Scholars a comfortable study space, a computer lab, and available printing. Each IUPUI Scholar is paired with an academic success coach. Programming for IUPUI Twenty-First Century Scholars recipients includes valuable experiential and co-curricular learning opportunities, such as academic and tutorial support, peer mentoring program, financial literacy workshops, job search assistance, as well as scholarship maintenance through ScholarKaleidoscope and ScholarCents. The IUPUI Twenty-First Century

Scholars Program is independently administered and funded by the University and the Indiana Commission for Higher Education (ICHE).

The IUPUI Twenty-First Century Scholars Pledge Grant, funded and administered by the IUPUI Twenty-First Century Scholars Program, is a partial grant aid provided for all Scholars who receive the Indiana TFCS. The maximum IUPUI Twenty-First Century Scholars Grant amount is around \$2,000 annually. Awards vary and are based on financial need as determined from the student's FAFSA. The partial grant aid can be used to cover direct or indirect costs for Scholars at IUPUI, such as room and board, books, transportation, or personal expenses.

Below summarizes the difference between IUB and IUPUI TFCS Program.

	IUB	IUPUI
TFCS On-Campus Support Services Office	X	X
TFCS Mentoring and Tutoring Services	X	X
TFCS Women Mentoring Program	X	
TFCS Study Tables and Computer Labs	X	X
TFCS Academic Advisors	X	
TFCS Student Success Coach		X
TFCS Summer Bridge Program	X	
TFCS In-House Study Abroad Scholarship	X	
TFCS Grant Aid	X*	X**
TFCS Alumni Association	X	
Active TRIO Student Support Services (SSS) program on-campus		X

* Full; **Partial

Appendix G

***15 TO FINISH* INITIATIVE: DISCUSSION QUESTIONS FOR POLICYMAKERS AND PRACTITIONERS**

- 1) Is the *15 to Finish* initiative a sound approach to the problem?
- 2) Could sufficient resources be identified to implement the *15 to Finish* initiative? What would be the source of those funds – federal, state, institutional?
- 3) What obstacles might block implementation of the *15 to Finish* initiative? Does the answer vary depending on the type of institution (e.g., public vs. private, 2-year vs. 4-year)?
- 4) Are there possible unintended consequences of implementing the *15 to Finish* initiative?
- 5) What is the group's decision regarding the *15 to Finish* initiative?

Appendix H

CONFIDENCE INTERVAL AND STANDARD ERRORS TABLE OF MARGINAL MEAN ESTIMATES WITH SIGNIFICANT INTERACTION EFFECTS: AWARD STATUS GROUP

Year 1 Cumulative Credits: Award Status Group

Marginal Means - Policy × Group

Policy	Group	Marginal Mean	SE	95% CI	
				Lower	Upper
0	0	36.064	0.330	35.416	36.711
	1	34.820	0.329	34.175	35.465
1	0	35.754	0.312	35.143	36.365
	1	36.558	0.306	35.957	37.159

Year 2 Cumulative Credits: Award Status Group

Marginal Means - Policy × Group

Policy	Group	Marginal Mean	SE	95% CI	
				Lower	Upper
0	0	61.715	0.614	60.512	62.919
	1	59.101	0.612	57.902	60.300
1	0	60.686	0.579	59.551	61.822
	1	61.588	0.570	60.472	62.705

Year 1 Cumulative GPA: Award Status Group

Marginal Means - Policy × Group

Policy	Group	Marginal Mean	SE	95% CI	
				Lower	Upper
0	0	2.910	0.024	2.862	2.957
	1	2.708	0.024	2.661	2.755
1	0	2.868	0.023	2.823	2.913
	1	2.773	0.022	2.729	2.817

Appendix I

CONFIDENCE INTERVAL AND STANDARD ERRORS TABLE OF MARGINAL MEAN ESTIMATES WITH SIGNIFICANT INTERACTION EFFECTS: GENDER

Year 1 Cumulative Credits: Gender

Marginal Means - Policy × Gender

Policy	Gender	Marginal Mean	SE	95% CI	
				Lower	Upper
0	1	34.557	0.355	33.860	35.254
	2	36.093	0.306	35.494	36.693
1	1	34.460	0.332	33.809	35.111
	2	37.440	0.288	36.876	38.004

Year 2 Cumulative Credits: Gender

Marginal Means - Policy × Gender

Policy	Gender	Marginal Mean	SE	95% CI	
				Lower	Upper
0	1	58.751	0.661	57.456	60.047
	2	61.628	0.569	60.513	62.743
1	1	58.026	0.617	56.816	59.236
	2	63.485	0.534	62.437	64.532

Year 1 Cumulative GPA: Gender

Marginal Means - Policy × Gender

Policy	Gender	Marginal Mean	SE	95% CI	
				Lower	Upper
0	1	2.731	0.026	2.680	2.782
	2	2.865	0.022	2.821	2.909
1	1	2.671	0.024	2.623	2.719
	2	2.931	0.021	2.890	2.972

Appendix J

CONFIDENCE INTERVAL AND STANDARD ERRORS TABLE OF MARGINAL MEAN ESTIMATES WITH SIGNIFICANT INTERACTION EFFECTS: GENERATION

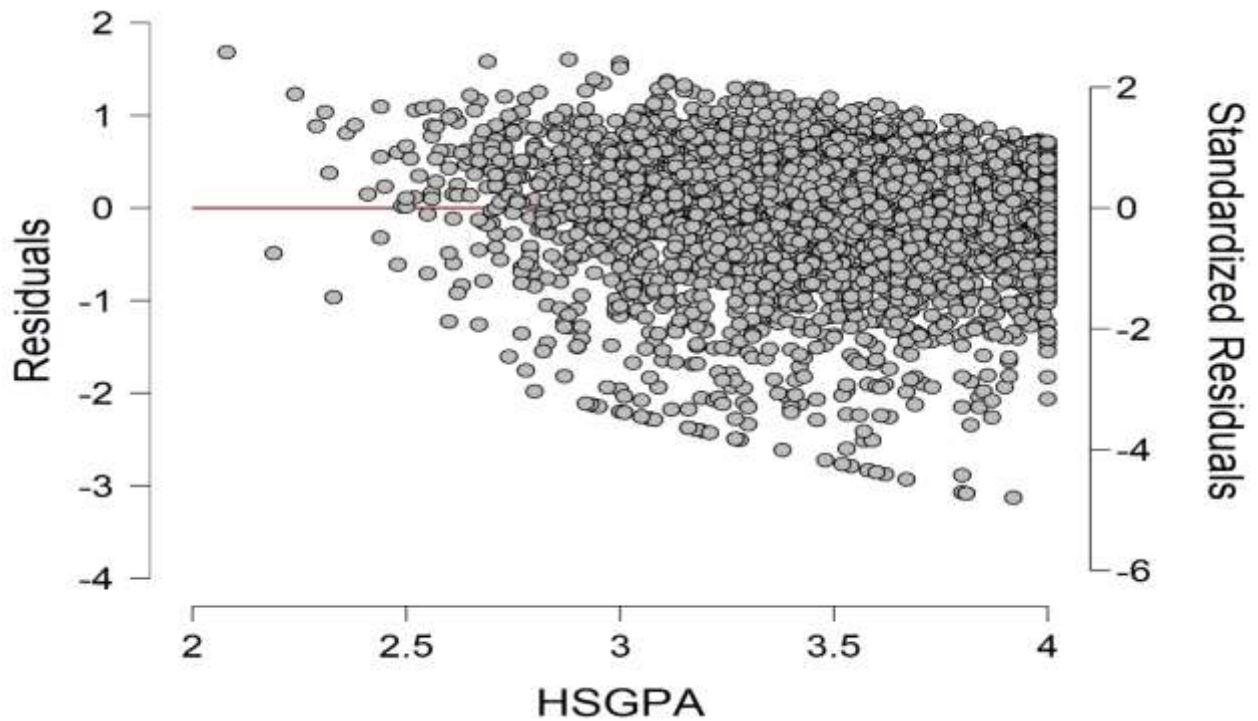
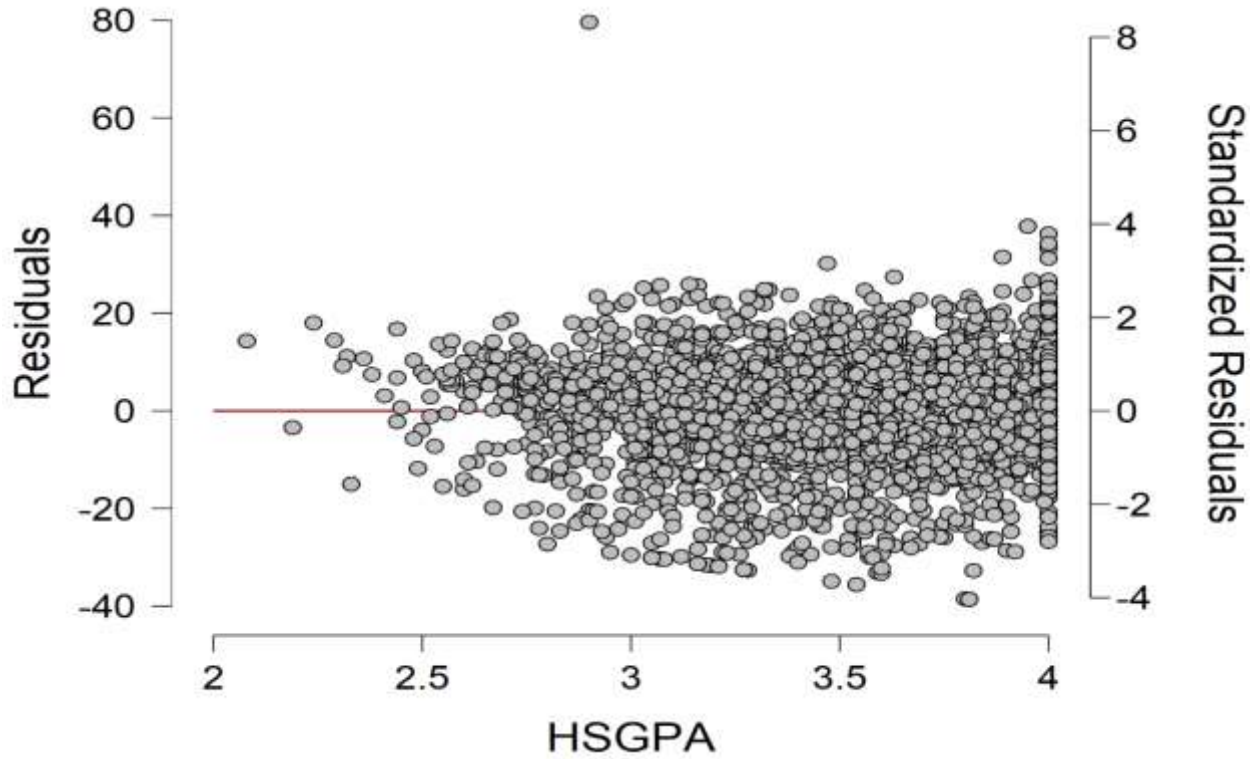
Year 1 Cumulative GPA: Generation

Marginal Means - Policy × FirstGen

Policy	FirstGen	Marginal Mean	SE	95% CI	
				Lower	Upper
0	0	2.881	0.023	2.836	2.926
	1	2.718	0.026	2.668	2.769
1	0	2.850	0.021	2.808	2.892
	1	2.780	0.024	2.732	2.827

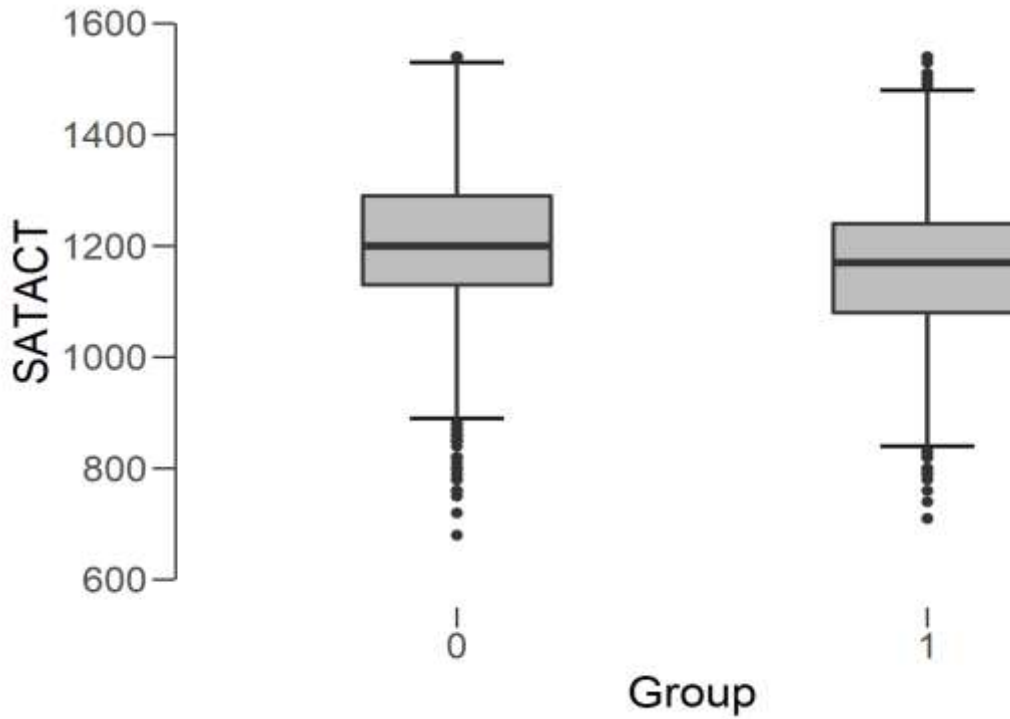
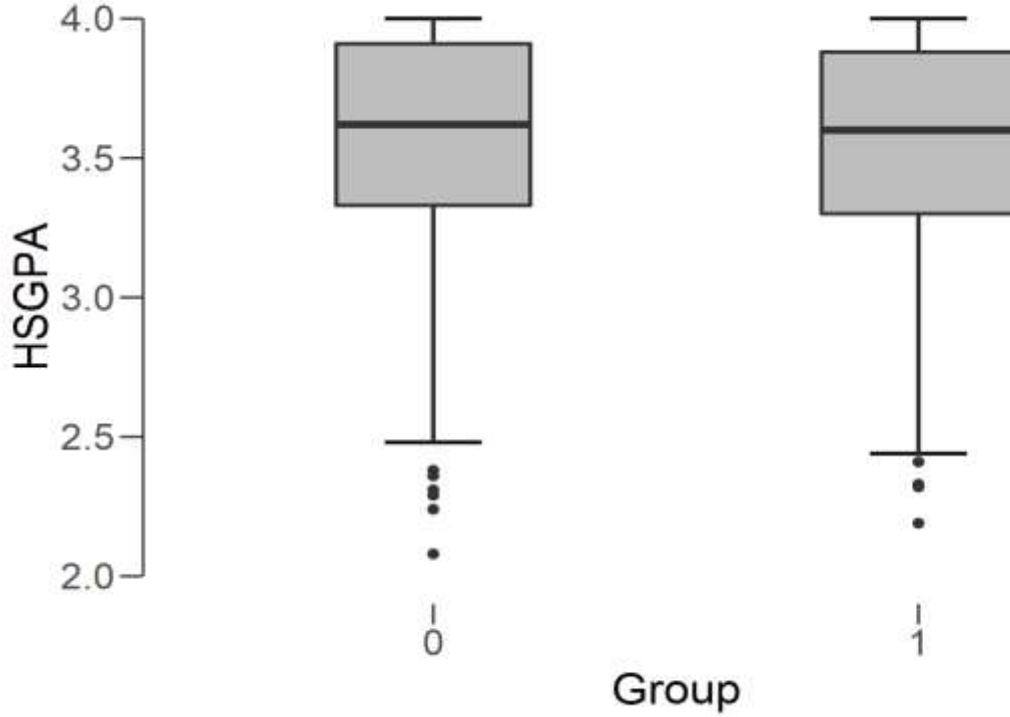
Appendix K

STANDARDIZED RESIDUALS FOR YEAR 1 CUMULATIVE CREDITS AND YEAR 1 CUMULATIVE GPA ON HIGH SCHOOL GPA AT IUB



Appendix L

BOX PLOT OF PRE-COLLEGE CHARACTERISTICS AT INDIANA UNIVERSITY BLOOMINGTON (IUB), BY AWARD STATUS GROUP



Appendix M

DESCRIPTIVE STATISTICS OF INDEPENDENT VARIABLES AND PRE-COLLEGE CHARACTERISTICS AT INDIANA UNIVERSITY BLOOMINGTON (IUB), BY AWARD STATUS GROUP

Independent Variables

	TFCS RECIPIENTS		NON-TFCS PELL RECIPIENTS	
	<i>N</i>	%	<i>N</i>	%
Gender				
Female	1,271	58.9%	1,172	55.5%
Male	884	41.1%	938	44.5%
Generation Status				
First-Generation	1,060	49.2%	816	38.7%
Continuing-Generation	1,095	50.8%	1,294	61.3%
Race/Ethnicity				
White/Caucasian	1,186	55.0%	1,428	67.7%
African American/Black	580	26.9%	326	15.5%
Hispanic/Latinx	240	11.1%	157	7.4%
Asian American	108	5.0%	147	7.0%
American Indian	17	0.7%	23	1.1%
Non-Resident/Alien	1	0.0%	1	0.0%
Other/Unknown	23	1.1%	28	1.3%

Pre-College Characteristics

	TFCS RECIPIENTS		NON-TFCS PELL RECIPIENTS	
	<i>N</i>	Mean	<i>N</i>	Mean
Academic Performance Group				
High School GPA	2144	3.55	2073	3.57
SAT Score	2155	1163	2103	1202

Appendix N

DESCRIPTIVE STATISTICS OF INDEPENDENT VARIABLES AT INDIANA UNIVERSITY-PURDUE UNIVERSITY INDIANAPOLIS (IUPUI), BY AWARD STATUS GROUP

Independent Variables

	TFCS RECIPIENTS		NON-TFCS PELL RECIPIENTS	
	<i>N</i>	%	<i>N</i>	%
Gender				
Female	1,197	66.8%	1,104	61.8%
Male	594	33.2%	682	38.2%
Generation Status				
First-Generation	983	54.8%	903	50.5%
Continuing-Generation	808	45.2%	883	49.5%
Race/Ethnicity				
White/Caucasian	1,006	56.2%	1,146	64.2%
African American/Black	458	25.6%	311	17.4%
Hispanic/Latinx	198	11.1%	154	8.6%
Asian American	87	4.9%	134	7.5%
American Indian	18	1.0%	14	0.8%
Non-Resident/Alien	1	0.0%	2	0.1%
Other/Unknown	23	1.1%	25	1.4%

Pre-College Characteristics

	TFCS RECIPIENTS		NON-TFCS PELL RECIPIENTS	
	<i>N</i>	Mean	<i>N</i>	Mean
Academic Performance Group				
High School GPA	1774	3.30	1710	3.30
SAT Score	1781	1041	1707	1073

Appendix O

DESCRIPTIVE STATISTICS OF ACADEMIC OUTCOME VARIABLES AT INDIANA UNIVERSIT BLOOMINGTON (IUB), BY AWARD STATUS GROUP

Academic Progress Variables

	TFCS RECIPIENTS		NON-TFCS PELL RECIPIENTS	
	Mean	SD	Mean	SD
Year 1 Cum. Credits Completed	35.8	10.83	35.9	10.00
Year 2 Cum. Credits Completed	60.4	20.02	61.2	18.68
Year 1 Cumulative GPA	2.74	0.79	2.89	0.73

College Completion Status Variables

	TFCS RECIPIENTS		NON-TFCS PELL RECIPIENTS	
	<i>N</i>	%	<i>N</i>	%
Year 4 Graduation Status				
Graduated	1,095	49.1%	1,106	52.4%
Not Graduated	1,060	50.8%	1,004	47.6%
Year 6 Graduation/Enrollment Status				
Graduated or still enrolled	1,434	66.5%	1,491	70.7%
Neither graduated nor enrolled	721	33.5%	619	29.3%

Appendix P

DESCRIPTIVE STATISTICS OF INDEPENDENT VARIABLES AT INDIANA UNIVERSIT-PURDUE UNIVERSITY INDIANAPOLIS (IUPUI), BY AWARD STATUS GROUP

Academic Progress Variables

	TFCS RECIPIENTS		NON-TFCS PELL RECIPIENTS	
	Mean	SD	Mean	SD
Year 1 Cum. Credits Completed	28.3	11.69	27.7	11.57
Year 2 Cum. Credits Completed	47.0	23.21	46.1	22.58
Year 1 Cumulative GPA	2.49	0.99	2.59	0.99

College Completion Status Variables

	TFCS RECIPIENTS		NON-TFCS PELL RECIPIENTS	
	<i>N</i>	%	<i>N</i>	%
Year 4 Graduation Status				
Graduated	453	25.3%	402	22.5%
Not Graduated	1,338	74.7%	1,384	77.5%
Year 6 Graduation/Enrollment Status				
Graduated or still enrolled	824	46.1%	875	48.9%
Neither graduated nor enrolled	967	53.9%	911	51.1%

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Higher education policy; the effects of financial aid on college retention and completion; philanthropy and fundraising in university advancement; stratification and inequality; organizational theory; policy evaluation; experimental and quasi-experimental methods

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Ph.D., History, Philosophy, & Policy in Education 2020

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Front Desk Office Assistant, Office of International Programs	2013
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Vice President for International Programs & Board Member China California Heart Watch	2011-2018
Research Assistant I, Faculty of Education The University of Hong Kong	2010-2011
Volunteer Teacher (China) WorldTeach	2009-2010
University Discussion Leader, Division of Undergraduate Education University of California, Irvine	2009

PEER-REVIEWED PUBLICATIONS

Ph.D. Dissertation

Chan, R. Y. (2020). *How does the 15 to Finish initiative affect academic outcomes of low-income, first-generation students? Evidence from a college promise program in Indiana* (Doctoral dissertation). Bloomington, IN: School of Education, Indiana University Bloomington. Retrieved from SSRN at <http://papers.ssrn.com/abstract=3319082>

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Journals

Chan, R. Y. (2019). [Review of the book *Taking it to the streets: The role of scholarship in advocacy and advocacy in scholarship*, by L. W. Perna]. *Journal of Higher Education Outreach and Engagement (JHEOE)*, 23(3), 130-134.

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RESEARCH AND SCHOLARY PRESENTATIONS

“How Does the 15 to Finish Initiative Affect Academic Outcomes of Low-Income, First-Generation Students? Evidence from a College Promise Program in Indiana”
American Educational Research Association (AERA) Annual Meeting
San Francisco, CA April 2020

“The Impact of 15 to Finish on Progression and Completion of Low-income Students: Evidence from a College Promise Program”
NASPA Annual Conference
Austin, TX April 2020

“Exploring International Joint and Dual Degree Programs: A Case Study between Indiana University-Purdue University, Indianapolis (IUPUI) and Sun Yat-set University (SYSU)”
Comparative & International Education (CIES) Annual Conference
Miami, FL March 2020

“How Does the 15 to Finish Initiative Affect Academic Outcomes of Low-Income, First-Generation Students? Evidence from a College Promise Program in Indiana”
Association for Education Finance and Policy (AEFP) Annual Conference
Fort Worth, TX March 2020

“The Impact of 15 to Finish Initiative on Progression and Completion of Low-Income, First-Generation Students in Indiana”
American College Personnel Association (ACPA) 2020 Annual Convention
Nashville, TN March 2020

“The Impact of 15 to Finish Initiative on Completion of Low-Income, First-Generation Students in Indiana”
National Symposium on Student Retention (NSSR)
New Orleans, LA October 2019

“How Does the *15 to Finish* Initiative Affect Academic Outcomes of Low-Income, First-Generation Students? Evidence from a College Promise Program in Indiana”
National College Access Network (NCAN) National Conference
Indianapolis, IN September 2019

“The Professionalization of Fundraising: A Transcript Analysis of CASE President Emeritus Peter McEachin Buchanan (1935-1991) on U.S. Higher Education Philanthropy”
European Research Network on Philanthropy (ERNOP)
Basel, Switzerland July 2019

“Higher Education as a Field of Study: An Analysis of 495 Academic Programs, Research Centers, and Institutes across 48 Countries Worldwide”
Bulgarian Comparative Education Society (BCES) Annual Conference
Sofia, Bulgaria June 2019

“The Future of Study Abroad in the United States: Opportunities and Challenges”
XVII World Congress of Comparative Education Society (WCCES)
Cancun, Mexico May 2019

“Using Technology and Salesforce CRM to Respond to Academic Probationary and High-Risk Students: Evidence from a Holistic Student Support Services Program for Low-Income, First-Generation Students at Indiana University Bloomington”
Indiana TRIO Annual Professional Conference
Indianapolis, IN April 2019

“Current Study Abroad Trends and Issues for U.S. and International Students: 2018 Results by The Forum on Education Abroad”
Comparative & International Education (CIES) Conference
San Francisco, CA April 2019

Reimaging Higher Education as a Field of Study: An Analysis of 495 Academic Programs, Research Centers, and Institutes across 48 Countries”
World Education Research Association (WERA) Congress
Cape Town, South Africa August 2018

“Results from the 2017 State of the Field Survey”
Forum on Education Abroad
Boston, MA March 2018

“Could Free College Tuition Programs Work in the South? Re-mapping College Persistence and Success for Low-Income Students”
Comparative & International Education (CIES) Conference
Mexico City, Mexico March 2018

“People, Power, and Inequality: Exploring the Emergence and Professionalization

- of Higher Education Studies across 48 Countries”**
Association for the Study of Higher Education (ASHE) Conference
Houston, TX November 2017
- “Higher Education and the Public Good: An Analysis of the Economic and Social Benefits for Completing a College Degree”**
Association for the Study of Higher Education (ASHE) Conference
Columbus, OH November 2016
- “Engaging Young Alumni: Millennials Participation in Homecoming Events at Indiana University, Bloomington”**
NASPA Student Affairs Fundraising Conference
Columbus, Ohio July 2016
- “China’s Gaokao Reform by 2017: Exploring English Teachers Perception of the National College Entrance Examination Reform from Shigatse, Tibet, China”**
Comparative & International Education (CIES) Conference
Vancouver, Canada March 2016
- “Can Philanthropy and Fundraising Fix Our Inequality? Exploring Philanthropy’s Influence on U.S. Higher Education”**
Association for the Study of Higher Education (ASHE) Conference
Denver, CO November 2015
- “Philanthropy in the Social World: Utilizing Organizational and Sociological Theory for Research on Higher Education Philanthropy”**
American Sociological Association (ASA) Annual Meeting
Chicago, IL August 2015
- “The Future of Higher Education: Examining the Goals and Values for Pursuing a College Degree”**
Society for Values in Higher Education (SVHE) Conference
Bowling Green, KY July 2015
- “Considering our Collaboration: Reflecting on our Ecuadorian Experience”**
American College Personnel Association (ACPA) 2015 Annual Convention
Tampa, FL March 2015
- “A Concerning Misalignment? Comparing Institutional and Student Perspectives on the Purposes and Goals of Completing a U.S. Bachelor’s Degree”**
American Educational Research Association (AERA) Annual Meeting
Philadelphia, PA April 2014
- “Assessing Graduate Attributes and Students’ Generic Skills in the Asia-Pacific”**
Association for Institutional Research (AIR) Annual Meeting
Long Beach, CA May 2013

“The Road to Academic Excellence: Developing an Effective College Environment for Students’ at aspiring “World-Class” Research Universities in China”

American Education Research Association (AERA) Annual Meeting

San Francisco, CA

April 2013

“The Effects of College Environment on Students’ Learning and Living Experience at World-Class Universities in China: A Comparative Case Study of The University of Hong Kong (HKU) and Shanghai Jiao Tong University (SJTU)”

Comparative & International Education Society (CIES)

San Juan, Puerto Rico

April 2012

INVITED WORKSHOP PRESENTATIONS

“Higher Education as a Field of Study: An Analysis of 495 Academic Programs, Research Centers, and Institutes across 48 Countries”

Department of Educational Sciences

José Simeón Cañas Central American University

San Salvador, El Salvador

November 2019

RELEVANT HIGHER EDUCATION TRAINING/WORKSHOPS

Doctoral Seminar

National Association of Student Personnel Administrators (NASPA)

March 2020, 2019

Graduate Student Policy Seminar (GSPS)

Association for the Study of Higher Education (ASHE)

November 2018

ASHE Institute on Community Engaged Research (ICER)

Lumina Foundation

October 2018

NextGen

American College Personnel Association (ACPA)

March 2017

New Scholars Dissertation Mentoring Workshop (NSDMW)

Comparative & International Education Society (CIES)

March 2014

UNIVERSITY TEACHING

Indiana University Bloomington

Adjunct Lecturer

AAST-A300: Asian Americans and Social Change, Asian American Studies

Program, Department of American Studies, College of Arts & Sciences

Spring 2019

Adjunct Instructor

EDUC-U212: Global Citizenship and Study Abroad: Contemporary Issues and

Spring 2016

International Perspectives, Department of Educational Leadership & Policy
Studies, School of Education

Peking University

Instructor July 2007; July 2012; August 2014; July 2015; June 2016
University of California, Irvine

University Discussion Leader Spring 2009
UNI STU 1: Freshman Experience, Division of Undergraduate Education

PROFESSIONAL SERVICE

Editorial Boards: *Journal of International Students, Journal of Critical Scholarship on Higher Education and Student Affairs*

Reviewer: *Journal of International Students, Review of Higher Education, Review of Educational Research, Cogent Education Journal*

Chair: Chair Awards Committee, Study Abroad and International Students SIG
Comparative and International Education Society (CIES) 2018-2020

Data Communication Strategies Committee
Forum on Education Abroad 2018-2019

Data Advisory Committee
Forum on Education Abroad 2017-2018

Book Awards Committee, Higher Education SIG
Comparative and International Education Society (CIES) 2017-2019

Chair, Roundtable/Research Paper Session
Association for the Study of Higher Education (ASHE) 2015-2019

Chair, Division J Paper Session
American Education Research Association (AERA) 2014-2019

Chair-Elect candidate, Graduate Student Council (GSC)
American Education Research Association (AERA) 2013

SUMMER STUDY ABROAD AND INTERNATIONAL EXCHANGE

Masaryk University, Brno, Czech Republic July 2019
Course: Quantitative and Mixed Methods Research Designs: From Designing to Publishing
Host: European Educational Research Association (EERA)

Eastern Michigan University , Quito, Ecuador <i>Course:</i> Higher Education Study Tour Instructor: Dr. Raul A. Leon, Associate Professor and Director of My Ecuador Trip	July 2014
Shanghai Jiao Tong University , Shanghai, China <i>Course:</i> Higher Education Policy and Planning Instructor: Dr. Nian Cai Liu, Professor, Director of the Center for World-Class Universities & Dean of Graduate School of Education	July 2013
Sung Kyun Kwan University , Seoul, South Korea <i>Course:</i> Nurturing Economics in Global Education Instructor: Dr. Sunwoong Kim, Professor	July 2012
Loyola University Chicago, John Felice Rome Center , Rome, Italy <i>Course:</i> U.S. Students Abroad: Lessons from Rome in Cultural Immersion Instructor: Dr. Terry E. Williams, Associate Professor & Assistant Dean	July 2011
Nyenrode Business University , Amsterdam, The Netherlands <i>Course:</i> Business Ethics and Sustainability Host: Utrecht Summer School	July 2011
London School of Economics-Peking University , Beijing, China <i>Course:</i> China and the World: Chinese Foreign Policy since 1949 Instructor: Dr. Wang Jisi, Professor & Dean of the School of International Studies	August 2010
Beijing Language and Culture University , Beijing, China <i>Course:</i> Introduction to Mandarin Host: American Institute for Foreign Study (AIFS)	July 2007

NON-DEGREE STUDY PROGRAM/VISITING GRADUATE STUDENT

Harvard University Graduate School of Education	Fall 2014
University of Pennsylvania Graduate School of Education	Spring 2012
University of the Pacific Center for Professional & Continuing Education	Fall 2011

LIST OF RELEVANT GRADUATE-LEVEL COURSES COMPLETED

Indiana University, Bloomington – 1) Comparative Education I, 2) Education Policy Studies Seminar, 3) Issues in Education Policy, 4) Foundations of Institutional Research, 5) Qualitative Inquiry in Education Research, 6) Nonprofit and Voluntary Sector, 7) Grant-Making and the Role of Foundations, 8) Economics of Philanthropy and the Nonprofit Sector, 9)

Principles and Practices of Fundraising, 10) Education Policy Research Seminar (3x), 11) Capstone in Institutional Research, 12) History of Higher Education and Philanthropy, 13) Applied Research for Educational Equity, 14) Political Perspectives of Education, 15) Higher Education and Public Policy, 16) Ph.D. Dissertation Proposal Prep, 17) Ph.D. Qualification Examination, 18) Ph.D. Thesis in the History, Philosophy, and Policy in Education, 19) Advanced Research, 20) Ph.D. Dissertation Defense

Boston College – 1) Higher Education in American Society, 2) Organization and Management of Higher Education, 3) Pro-doctoral Seminar in K-16 Education, 4) Student Development Theory, 5) Sociology of Education, 6) Interpretation and Evaluation of Research, 7) Contemporary Issues in Higher Education - Global Citizenship and Higher Education, 8) Education Law and Public Policy, 9) Qualitative Research Methods, 10) Catholic Higher Education, 11) Institute for Administrators in Catholic Higher Education, 12) Comparative and Global Systems of Higher Education, 13) Organizational Analysis, 14) Intermediate Statistics, 15) General Linear Models

Harvard University – 1) Institutional Advancement in Higher Education

University of Pennsylvania – 1) Introduction to Statistics in Education Research, 2) Education and Social Entrepreneurship, 3) Diversity in Higher Education

The University of Hong Kong – 1) Globalization and Higher Education, 2) Managing Organizational Change in Higher Education, 3) Community College Development, 4) Poverty Development and Education: Challenges for a Global World, 5) Methods of Research & Enquiry, 5) Teaching & Learning in Higher Education, 7) M.Ed. Dissertation

PROFESSIONAL MEMBERSHIPS

American College Personnel Association (ACPA)
Association for Education Finance and Policy (AEFP)
American Education Research Association (AERA)
Association for Institutional Research (AIR)
Association for the Study of Higher Education (ASHE)
Association for Public Policy Analysis and Management (APPAM)
Comparative and International Education Society (CIES)
Educational Opportunity Association (EOA)
Indiana TRIO
NAFSA: Association of International Educators
National Association of Student Personnel Administrators (NASPA)
Southeastern Association of Educational Opportunity Program Personnel (SAEOPP)
Tennessee Association of Special Programs (TASP)
Tennessee Association for Student Success and Retention (TASSR)
World Education Research Association (WERA)
