

Equity in Action:
Estimating the Association Between Funding, Expenditures, Tuition, and Affirmative
Action Case Law on Enrollment and Completion Rates at Selective Colleges

by
Tiffany Marie Okolo

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Approved November 2020 by the
Graduate Supervisory Committee:

Jeanne Powers, Co-Chair
Gustavo Fischman, Co-Chair
Margarita Pivovarova

ARIZONA STATE UNIVERSITY

December 2020

ABSTRACT

I conduct a series of analyses aimed at assessing equity in selective American colleges over a 20+ year time frame. My main measures of equity are enrollment and completion in selective colleges, which I disaggregate by race/ethnicity. After creating an institutional-level panel data set with variables on college revenues and expenses, tuition, institutional control, and affirmative action case law decisions, I estimate a Generalized Least Squares (GLS) model with institutional level random fixed effects to identify factors associated with enrollment and degree completion for white and non-white students at selective United States colleges. My results suggest that affirmative action case law is associated with changes in enrollment and degree completion rates of white and non-white student alike. Increasing equity for non-white students does not compromise equity for white students. There was a statistically significant relationship between federal spending, enrollment, and degree completion for non-white students. When selective colleges increased tuition, instructional costs, academic support services expenditures, and student support services, Asian American/Pacific Islander students were likely to see enrollment and degree completion declines. Degree completion and enrollment differences were observed for Asian American/Pacific Islander, Hispanic, and white students at public, private and for-profit colleges. In the years after the *Adams* and *Hopwood* court decisions, equity for non-white students declined at selective colleges. Enrollment and degree completion for non-white students increased following *Grutter*, *Gratz*, *Coalition*, and *Fisher* decisions. Enrollment of white students increased following *Fordice* and *Hopwood*. Degree completion for white students increased post *Coalition* and decreased post *Fisher*.

DEDICATION

To my kids and all the generations who come after me. My dissertation is part of the puzzle when it comes to dismantling power, oppression and discrimination in America. My dissertation alone will not change the world. It is the youth of America who are crucial for the advancement of social change. America needs you to pick up the torch and carry it high. When you do, I want you to remember the words of Winnie the Pooh, “you are braver than you believe, stronger than you seem, smarter than you think, and loved more than you know.” I finished this dissertation for you, all your friends, and everyone who you love.

ACKNOWLEDGMENTS

My path to degree completion has been extended, long and arduous and tenuous at times because of work commitments, family issues, and mental health crisis. My supporters never left my side.

To my mom and dad, I am able to submit my dissertation with confidence because of the foundation you gave me as a child. To my Dad, I believe you when you say it is better to work with your mind than your body. Mom it was through you that I learned it was always okay to be a book worm because you always had a book in hand. Thank you to both you always celebrated my academic achievements and encouraged me to keep learning.

To Timothy, my life became richer the day we met. All of sudden my dissertation was given purpose and value. Now, our kids can understand the mechanisms that effect college enrollment and degree completion for people like them. I will be forever grateful for the permission you gave me to stop working when life was too much and the encouragement I got when I started to meet milestones. This unwavering support made it possible for me to submit my dissertation to my committee time and again until final approval was given.

To Drs. Mellen and Ferrick, thank you for encouraging me to complete my degree in spite of the challenges I was facing in my divorce. It was through our relationships that I learned the importance of resilience and perseverance.

To Dr. Patricia Cardenas-Adame, AmeriCorps VISTA, St. Mary's Food Bank, and the Alliance of Arizona Nonprofits, thank you for allowing me to use work time for

the completion of my comprehensive exams and dissertation. Without the accommodations to my work demands, I would have never finished.

To Dr. Amy Topper and Dr. Joy Anderson, thank you for writing with me at Hob Nobs on the weekends. I needed this weekly connection to maintain my progress and connection to the program.

To Dr. Jeanne Powers, my committee co-chair, thank you for taking me in as the program was being reorganized and perfecting my thinking and writing skills. I have learned how to conduct academic research because of your conscientious feedback and keen analytical skills.

To Dr. Gustavo Fischman, my committee co-chair, thank you for the grace that was extended when I was not proficient in asking you to join my committee. I am so glad you joined my committee, I am not sure I would be where I am today without your acceptance. It was from you that I learned how to talk about power, politics, and policy. I hope you can see the effects your teaching had on my choice for a dissertation topic. They are inextricably linked for me.

To Dr. Margarita Pivovarova, my methodologist, assembling my data set was one of the hardest parts of my dissertation because in school we were always given pre-assembled data sets. Thank you for helping me learn Stata. My dissertation would not be complete without your help.

To Robin Boyle, the phone call you made in July 2020 made all the difference. I was considering enrolling in law school in Fall 2021 so I could have a terminal degree because I knew my time was out for my Ph.D. Then you called, I knew I had to finish.

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CHAPTER 1

Introduction

In the period after World War II, enrollment in higher education grew exponentially in the United States. The return of veterans introduced 1.1 million new college students (Geiger, 2010, p. 59) into a rapidly expanding higher education system. In 1947, 2.3 million students were enrolled in approximately 1,800 colleges and universities (Goodchild, 2007). By 2016 approximately 16.9 million students were enrolled in 3,895 four-year colleges and universities (U.S. Department of Education, 2016).

During this period of growth, access to selective higher education institutions has been limited for Blacks, Hispanics, Asian American/Pacific Islander/Pacific Islander, and American Indian students. This exclusion can be traced back to the implementation of the G.I. Bill following WWII¹ (Olson, 1973; Onkst, 1998; Serow, 2004; Wynn, 1993). Twenty years later the passage of the 1964 Civil Rights Act banned discrimination based upon race for U.S. colleges. The act stated that “no person in the United States, on the

¹ Onkst (1998) reports “when black World War II veterans in Georgia, Alabama, and Mississippi tried to use the G.I. Bill to improve their socio-economic conditions, they could not do so because of a combination of racial discrimination and poor administration” (p. 518). When Black students were denied entry to colleges, many sought enrollment in technical schools. The admission standards for four year colleges often excluded Black veterans who did not have access to adequate elementary and secondary education. high schools. “The average educational level of southern black veterans consequently rested somewhere around fifth grade and restricted most of them to vocational schooling” (Onkst, 1998, p. 527). In addition, Black veterans experienced difficulties entering technical schools because southern states did not expand the number of technical colleges to meet the enrollment demand (Onkst, 1998). Even if a Black veteran gained admission to a college, the Black students were restricted to programs that lead to “traditional ‘Black’ jobs” (Onkst, 1998).

grounds of race, color, or national origin be excluded from participation in, or the benefits of, or be subjected to discrimination under any program or activity receiving federal funding” (Malaney, 1987, p. 17). Colleges responded to Civil Rights Act by introducing the consideration of race into college admission decisions (*Bakke v. the University of California*, 1978). The utilization of the term affirmative action did not take hold until President Johnson signed executive order 11246 which “required federal contractors to increase the number of minority employees as an ‘affirmative step’ toward remedying years of exclusion for minority workers” (Harper, Patton, & Wooden, 2009). It would take “until the late 1960s and early 1970s for Black students to notice changes in enrollment” in Predominately White Institutions (PWIs) (Harper, Patton & Wooden, 2009). For example, Black enrollments increased from 27% in 1972 to 34% in 1976 (Kelly & Lewis, 2000).

By the 1980s the enrollment growth experienced by Black and Hispanic students in the 1970s reversed course and began to decline. The reduction in enrollment of Black and Hispanic students was exacerbated by changes to the federal financial aid program made in the 1980s (Allen, 1998; Arbeiter, 1987; Hauser, 1992, Orfield & Paul, 1987). Some scholars found that the passage of state-wide bans on affirmative action plans either reduced enrollment for Blacks and Hispanics at selective colleges (Harris, & Tienda, 2010; Long & Tienda, 2008) or redistributed enrollment from selective to less selective colleges (Domina, 2007).

The stratification of higher education has contributed to the unequal access for non-white populations. Most colleges use test scores to define talent and determine eligibility. Alon & Tienda (2007) found a “*shifting meritocracy*” for all students; test

scores required for admission today are higher than what white students scored in earlier years. Since student test scores are commonly viewed as an indicator of institutional quality, Black, Hispanics and American Indian students are excluded at the same rates as prior years.

In the present structure, colleges and universities that are selective are widely viewed as excellent. Astin (1990) contends that elite colleges gather prestige by admitting and graduating students who would be successful with minimal teaching and support. Accessible colleges serving a diverse student population with lower earnings for graduates tend to have lower social value when compared with elite colleges.

Trow (2010) expands upon the correlation between selectivity and stratification. In his typology of collegiate systems, high selectivity correlates with an elite educational system. Whereas a universal system of post-secondary education succeeds when the greatest percentage of the population is educated with little to no measures of selectivity in college admissions. In this typology, elite colleges and universities focus on preparing the “mind and character of the ruling class. . . for broad roles in the government and the learned professions” (Trow, 2010, p. 95). When the American higher education system developed, the initial focus for most colleges and universities was on educating the elite. Today we are living with the legacy that some of the original colleges in the American higher education system gain prestige and maintain power by using high measures of selectivity which produce “homogeneous student populations” and restrict access to curriculum “with high and common standards” (Trow, 2010, pg. 98).

When nation-states expand to a system of mass education, colleges focus on preparing the elite as well as the “leading strata of all the technical and economic

organizations of society” by shifting the curriculum to “focus on transmission of skills for . . . technical elite roles” (Trow, 2010, p. 95). With the introduction of a mass system of education, a society should see an increase in access and a reduction in selectivity because colleges and universities are successful when they provide a comprehensive education with “diverse standards” and focus on the “mobility of students and staff” (Trow, 2010, p. 98). The influx of public support for college education made after WWII fueled the shift from an elite system of higher education system in America to a system of mass education. Of central concern in my dissertation is whether we have truly maximized the “mobility of students and staff” needed to achieve Trow’s vision of a mass system of education.

Because of the historical patterns of exclusion, my dissertation explores the changes in enrollment in a national sample of selective institutions following changes in federal higher education policy and desegregation cases. For my dissertation I seek to identify mechanisms of mobility so we can create a road map into a universal system of higher education. In a universal system of postsecondary education, colleges achieve “great diversity” through the utilization of “no common standards” (Trow, 2010, p. 98). When a nation-state achieves universal education, colleges succeed by enrolling and graduating a student body that reflects the population as a whole in the service of educating a citizenry prepared for democratic and workforce participation. It is in a universal educational system that a true meritocracy can flourish and equity can be achieved.

Defining Equity

I focus on college enrollment and completion because Gutmann (1987) defines equity as the responsibility to minimize “inequalities that deprive children of educational attainment adequate to participate in the political processes” (p. 134). Because graduates of selective colleges and universities often experience greater demand in the workforce, I concentrate on understanding the dynamics that foster enrollment and degree completion for Blacks, Hispanic, Asian American/Pacific Islander, and Native American students in the top tier of colleges and universities.

Since diversifying colleges is a crucial step in diversifying the workforce I seek to understand the conditions that foster the enrollment and graduation of diverse student population. Lindahl & Canton (2007) contend equitable treatment for society exists when “the social return to education is larger than the private return” (p. 21). The enrollment and graduation of a diverse student body enhances the social return on post-secondary education by increasing individual self-efficacy (Denson & Chang, 2009); enhancing students’ ability to get along with different races and cultures (Denson & Chang, 2009); amplifying the likelihood of democratic participation (Bowman, 2011 & Gurin, Nagda, & Lopez, 2004); and maximizing academic abilities such as critical thinking, problem solving, writing, listening, and language acquisition (Gurin et. al, 2002). As diversity in the workforce expands, colleges are being called to graduate “ ‘empowered, informed, and responsible’ student[s] capable of negotiating the inevitable differences in a diverse society” (Engberg, 2007, p. 285).

I contend racial equity begins with access, or the enrollment of a diverse student body. Access (i.e. “the capacity for individuals to participate in higher education

organizations”) for non-white students results from financial, geographic, programmatic, academic, cultural, social, and physical accessibility (Dowd, 2003 & Heller, 1999).

Access increases racial equity when barriers to enrollment for non-white groups are reduced. Yet simply granting access to high quality educational experiences does not produce the social value obtained when students graduate with bachelor degrees. An equitable college enrolls and graduates a diverse student body.

In my analysis I focus on three ways of assessing equity in selective American colleges. The dissertation begins by describing the percentage of students enrolled in selective colleges or universities by race/ethnicity over time. I continue by examining how enrollment and completion rates of racially diverse students are associated with the deployment of institutional resources (revenues, expenses, college costs, and federal financial aid). Finally, I explore the association between federal desegregation cases and the enrollment and completion of racially diverse students.

In court opinions on desegregation, the federal judiciary has confirmed the importance of allowing colleges to use race as a factor in the admission process (*Bakke v. the University of California*, 1978; *Grutter v. Bollinger*, 2003; *Fisher v. The University of Texas*, 2013). In a five to four decision, the U.S. Supreme Court upheld affirmative action while striking down the use of quotas to enroll a diverse student body (*Bakke v. the University of California*, 1978). Similarly, the US Supreme Court voted five to four that colleges have a compelling state interest to enroll a diverse student body so as “minority students do not feel isolated or like spokespersons for their race; to provide adequate opportunities for the type of interaction upon which the educational benefits of diversity depend; and to challenge all students to think critically and re-examine stereotypes”

(*Grutter v. Bollinger*, 2003). Finally, *Fisher I* gave colleges and universities permission to use “race as part of a holistic admissions program where it cannot otherwise achieve diversity” (*Fisher v. University of Texas*, 2013).

My interest in the role of federal government law and policy on enrollment and retention emerged because in my reading I noticed that prior research has typically relied upon historical (Geiger, 2011; Thelin, 2011), comparative (Curs, Singell, & Waddell, 2007; Keppel, 1987) and/or socio-political (Bastedo & Gumport, 2010; Bogue & Aper, 2000) arguments to explain the possible effects of law or policy on enrollment patterns and the structure of the higher education system. For example, Curs, Singell and Waddell (2007) conducted an analysis of the “quantifiable outcomes of Pell on the access, choice, and persistence of low income students” (p. 281). Furthermore, the role of the federal government is usually explored in relation to a specific identity group (Allen & Jewell, 2007; MacDonald & Garcia, 2007; Reyhner & Eder, 2007; Wang, 2007), a single policy (Bowman, & Marzouk, 1992; Carbonaro, Ellison, & Covay, 2011; Curs, Singell, & Waddell, 2007; Hannah, 1996; Herbold, 1994), or a significant court case(s) (Johnson, 1993; Long & Tienda, 2008; Olivas, 2013; Olson & Hagy, 1990; Scanlan, 1996). In my dissertation, I analyze panel data to identify the conditions which foster the enrollment and degree completion of four racial groups over multiple changes in federal law and policy.

Significance, Research Questions, & Dissertation Overview

The college choice literature seeks to understand how individuals make decisions about applying to and enrolling in specific colleges and universities (Alon & Tienda, 2007; Hoxby, 2009; Karen, 1991; Mullen, 2010; Perna, 2000). Studies of enrollment

determinants explore the relationship between individuals, organizations, and institutions by seeking to explain factors influencing college student enrollment (Hearn, 1984 & 1988b; Kane, 1994). Still others seek to explain how external stimuli such as state legislature composition or Pell grant funding influence organizational behavior of colleges and individual choice for students (Heck, Lam, & Thomas, 2014; Hicklin & Hawes, 2012; Pennington, McGinty, & Williams, 2010). My dissertation expands our understanding of enrollment determinants and completion rates for Black, Hispanic, Asian American/Pacific Islander, and Native American students.

Research Questions. My dissertation addresses the following research questions:

- 1) Did the distribution of the student body by the race/ethnicity (i.e. white, Black, Hispanic, Asian American/Pacific Islander and Native American) of students change following changes in federal higher education policy and affirmative action case law?
- 2) How do changes in college finance and affirmative action case law change the distribution of degrees awarded to white, Black, Hispanic, Asian American/Pacific Islander and Native American students at selective American colleges?

Significance. The results of my study will provide important insights about the possible factors that may increase equity and student body diversity to the research, policy, and legal communities. Race-based admission decisions continue to be a legally-contested topic. Knowing how race-based cases are associated with national enrollment and completion patterns may give colleges and universities insight on how these cases will affect future enrollment. My dissertation is the first study to evaluate the effects of

changes in affirmative action lawsuits on enrollment and completion rates using a national sample rather than a state-based sample. Finally, knowing how federal policy shapes the college enrollment and completion rates of different racial/ethnic groups may lead to greater equity in policy design and implementation.

Dissertation Overview

In Chapter 2 I review the literature on the factors associated with post-secondary enrollment and completion, the types of enrollment studies, and the history of federal law and policy. I explore the connection between college finance, tuition, selectivity & college type on enrollment and completion rates. The review of the enrollment studies differentiates studies into four categories - college choice, enrollment determinants, enrollment trends, and enrollment forecasting – with the review concentrating on enrollment trends and determinants. The review of federal law and policy includes literature relevant to the laws and policies being evaluated in the study.

In chapter 3 I review the research questions, describe the data sources, define variables, and describe the method of analysis. I describe how each variable of interest was created from the Integrated Postsecondary Education Data System (IPEDS). I define how a selective college was defined using SAT test scores and admission rates.

In chapter 4 I present descriptive statistics for the selective colleges in my sample. Then I present trends in enrollment from 1990 to 2012. I concluded the data analysis by testing hypothesis regarding the relationship between the enrollment and completion rates of non-white students and college finance, changes in affirmative action case law, and college control.

My dissertation ends with a discussion the implications of my data analysis for the policy, legal, and research communities. Limitations of the study are presented along with recommendations for future research. I present recommendations for increasing the enrollment of non-white student populations in selective American colleges.

CHAPTER 2

Literature Review

Variables Affecting Equity for Non-White Students

In my analysis I examine the relationship between federal and state funding, tuition, and key court cases related to affirmative action on the enrollment and completion rates of non-white students in selective colleges and universities. I decided to limit my study participants by selectivity because attending a selective college or university increased the earnings of students from low-income families (Dale & Krueger, 2002). I selected the variables including in the analysis based upon the research presented in this chapter. First I explain how federal funding (Title III and Title IV) has previously been linked to enrollment and completion rates. Following the review of research on federal funding, I do the same for state-level funding. Once we understand the association between revenues and enrollment and completion rates, I explain how prior research has linked different types of expenditures on enrollment and completion. Next, I describe what is known about the effect of affirmative action lawsuits on college enrollment and completion. I conclude the chapter by explaining the different methodologies used to explain enrollment determinants and trends.

Federal Funding, College Access and Completion

The federal government relies heavily on the infusion of capital into the higher education system to gain regulatory influence over postsecondary institutions. The most prominent funding mechanisms for selective colleges and universities are the federal financial aid program, Title III, and Title V.

Title IV Funding – Federal Financial Aid

For the past 53 years, the federal financial aid program allocated federal funding in the form of grants, loans, and work-study funding based upon financial need of each individual college student. Keppel (1987) asserts the goal of the 1965 Higher Education Act was to “further a social cause-providing equal opportunity-through higher education” (p. 50; see also Mumper et. al, 2011). The 1972 Higher Education Amendments reconstituted the individual grants provided by the federal government and started the Pell Grant program, the largest single source of need-based aid (Curs, Singell, & Waddell, 2007).

The Pell Grant is a specific financial award given to increase the enrollment of low-income students. Since its inception, the Pell Grant has been a staple of the student financial aid program. A few modifications have increased the number of students using the program and the federal contribution rate. Just four short years after implementation, the Pell grant was expanded to serve middle-class students in the 1978 Middle Income Student Assistance Act (Curs, Singell, & Waddell, 2007). Subsequent changes eliminated of the half-cost requirement (1992 Higher Education Act) and increased in the maximum award provision (1980 Higher Education Opportunity Act).

The expense of and the number of students served by the Pell Grant program has increased steadily since program creation. Slaughter & Rhoades (2011) contend the value of a Pell Grant has steadily declined since program inception. Over a 30 year period (1977-2007), the number of students receiving a Pell Grant has increased by 3.5 million students; the cost of the program has increased by 9.8 billion; and the percent of tuition covered decreased by 30% (Mumper et. al, 2011, p. 122). In 2010, 87% of Pell

Grant recipients graduated with debt, the average debt equaling \$24,800 (Slaughter & Rhoades, 2011, p. 440).

The research on the relationship between Pell Grant funding on enrollment rates has yielded mixed results. Increasing federal financial aid, incrementally increased enrollment probabilities although the results varied considerably by the amount of expected aid (DesJardins, Ahlburg, and McCall, 2006). A difference-in-difference study found a small positive relationship (1.5 percentage points for men and 1.3 percentage points for women) on enrollment rates for returning adult students (Seftor & Turner, 2002). In another study, an increase of \$1,000 in grant aid increased enrollment by three to four percentage points (Deming & Dynarski, 2009). The inconsistency in the findings may be because the percentage of college costs covered by a Pell grant is low (Rubin, 2011), enrollment rates between low-income students was similar to all students (Hansen, 1983), and the current cross-sectional data on individual college choice decisions is insufficient to measure the relationship between Pell Grants and enrollment and persistence trends (Bettinger, 2004).

Additionally, researchers have determined that Pell Grant influences students' initial enrollment decisions, persistence (Bettinger, 2004), and completion. If a selective college wants to increase the enrollment of low-income students, increasing grant aid by \$1,000 increases the probability of enrollment by 8.6% (van der Klaauw, 2002), and decreases the chances a student would withdraw between the first and second year of enrollment by 9.2 percentage points (Bettinger, 2004). Other researchers have documented marginal increases in completion rates associated with an increase in grant funding (Denning, 2019).

The relationship between financial aid on college enrollment and completion varies by race. Black students are more dependent on financial aid awards when compared to white students (St. John, Paulsen, and Carter, 2005). In another study, Kim (2004) noticed that Asian American/Pacific Islander students were more likely to attend a first choice college if a financial aid award included grants and loans (32% higher) and loans only (38% higher) when compared to Asian American/Pacific Islander students with no financial aid. Because differences in parental income and academic ability exist, Black and Hispanic students become sensitive to financial aid offers at second and third choice colleges and universities (Kim, 2004).

Title III, Title IV, and ARRA Funding

The federal government directly subsidizes specific types of colleges through Title III and Title V funding. Title III financing became available to “developing institutions” to meet the demands of Black college students during the long journey of desegregation of predominately white institutions (PWI’s) with the passage of the 1965 Higher Education Act (Keppel, 1987). The sheer increase in the number of Black students attending college (1.033 million in 1976 to 1.5 million in 1994) could have contributed to the on-going need for HBCU’s (Allen & Jewell, 2007). The demand of HBCU’s has been influenced by the “increase in community colleges and the *Adams* court decisions desegregating higher education in the south” (Sissoko & Shiau, 2000).

The use of “developing institutions” in the policy allowed community college and small church-related colleges to also access funding under Title III (Keppel, 1987). The nuance in language largely expanded enrollment growth at PWI’s while enrollment at “traditionally black institutions” remained steady (Keppel, 1987). The Higher Education

Act of 1986 ushered in changes to the type of institution eligible for Title III funding to “traditionally black institutions” and restricted the amount of funding a “community college and/or a small, faith based college” could receive. The change in policy corresponds to a national concern over the decline in the college attendance of Black and Latino/a students (Baker & Velez, 1996).

Concerns over access to higher education for Latino/a students did not become a federal issue until the 1980s and 1990s (MacDonald & Garcia, 2007). A failed attempt to alter the Higher Education Act in 1984 recommended changes to Title III funding requirements and created an institutional designation of “Hispanic Serving Institution” and sought to increase funding for federal high-school to college programs serving Latino/a students (MacDonald & Garcia, 2007). The policy measures recommended in 1984 later became policy with the Higher Education Act of 1992 and 1998 (MacDonald & Garcia, 2007).

The trajectory of federal support to Native American students for post-secondary education differs from both Black and Latino/a students. The ability of the U.S. federal government to provide funding to tribally controlled colleges did not occur until the passage of the Tribally Controlled Community College Assistance Act of 1978. This act allowed the federal government to provide federal financial assistance while giving tribal governments the chartering authority, control over governing board composition, and the ability to enroll a majority of Native Americans (Reyhner & Eder, 2007). Glazer (2004) reports the federal government has been authorized through legislation to “give the tribe the amount that the government would have spent to plan, conduct, and administer the program itself” (p. 1637).

The majority of institutional funding has been targeted at institutions serving a special student population. The one exception to institutional-based aid occurred with the passage of the American Recovery and Reinvestment Act of 2009. The economic collapse of 2008 could have resulted in a significant reduction in higher education access. The American Recovery and Reinvestment Act of 2009 “offered billions of dollars’ worth of provisions for higher education, ranging from tuition tax credits to state fiscal stabilization financing intended to provide for facility upgrades and compensate for state-level budget cuts” (Gilbert & Heller, 2013, p. 427). In order to receive the federal funding, states had demonstrate a “maintenance of effort,” which “required states to continue to the ARRA dollars to fund higher education at the same level as each state had in previous years” (Mumper et. al, 2011, p. 117). McGuinness (2011) claims the ARRA served as the states’ signal for more federal involvement in financing post-secondary education. The connection between the ARRA funding and access to higher education has remained relatively untested. We know from demographic trends ARRA may have contributed to an increase in enrollment among Hispanic (15%), Black (8%), and Asian American/Pacific Islander (6%) students (Taylor et. al, 2010).

State Funding

State funding levels and aid programs influence enrollment by altering net cost, reducing opportunity costs, and increasing return on investment for individual students. A fixed-effects regression with panel data from four-year and community colleges found that a \$100 increase in state-level grant funding increased the probability of enrollment, on average, by 1.26% with slight variations by racial groups (Heller, 1999). Additionally, a hierarchical generalized linear model using cross-sectional data for the

1995 academic year revealed that completion increases when state need-based and merit-based grant programs exist (Titus, 2006a). While the same study found that degree attainment in the state, unemployment rates, or state appropriations other than grants does not influence college completion rates for individuals this may be attributable to a misalignment of state appropriations and graduation cohort (Titus, 2006a). Using fixed-effects and OLS regression, Chuang (2010) found a statistically significant relationship between state appropriations and public college enrollment from 1987-2007 in Virginia. The mixed results about the influence of state appropriations, student aid, and economic conditions suggests the field may benefit from further exploration to understand the influence of these factors on equity and access in higher education.

College Revenues and Expenses

Chen (2012) found a significant positive relationship between student support expenditures and a reduced probability that students will drop out of college. Including expenditures for instruction, academic support services, student services, and administration in regression equations to predict completion accounted for approximately 72% of the variation (Gansemer-Topf & Schuh, 2006). Instructional and academic support expenditures produce a significant positive effect on completion, while administrative and student services expenditures had a non-significant negative effect on completion (Ryan, 2004). The value of increasing instructional expenditures varies from a 0.25% increase in graduation rates for a 1% per student increase in expenditures to as low as a 0.08 percentage point increase for a \$100 increase per student (Ryan, 2004; Webber & Ehrenberg, 2010). Investing \$100 in student support services and academic support services may produce a 0.02 and 0.08 percentage point increase in graduation

rates respectively (Webber & Ehrenberg, 2010). Increasing research expenditures by \$100 actually reduced graduation rates by 0.09 percentage points. Titus (2006a, 2006b) contends that tuition and fees are more accurate variables for predicting persistence and completion because of the collinearity between the different types of expenditures (i.e. administration, instruction, student services, grants/scholarships, and research) produced a non-significant relationship between expenditures and completion rates (Titus, 2006b).

Tuition

Mumper & Freeman (2010) note tuition and fees began to steadily increase by 5% a year between 1980-1994, 2% a year from 1995-2000, and then sharply increase by 28% percent between 2001 to 2004. Even with the increasing cost of higher education, the demand for post-secondary education has continued to increase (Mumper & Freeman, 2010). Tuition, net cost, and financial aid, have a direct relationship on the application, enrollment and completion of individual students (Berger & Kostal, 2002; Curs & Singell, 2002; DesJardins, Ahlburg, & McCall, 2002; Dynarski, 2003; Hight, 1975). Location is also associated with students' enrollment decisions (Epple, Romano, & Seig, 2006; Hill & Winston, 2006; Jackson, 1990; Kane, 1994b; Kim, 2004; Moore, Studenmund, & Slobko, 1991).

High cost, high financial aid models were seen as a way to maximize access for low-income students. The high cost, high financial aid model, which was advanced by colleges and universities and implemented from 1976 to 2005, may not have produced the anticipated gains in applications, enrollment, and completion (Terry Long & Riley, 2007). When the cost of private colleges increases by 1%, public, four-year colleges may see a decrease of 2.31% and 5.16% of in-state and out-of-state student applications,

respectively (Curs & Singell, 2002). In a study of single four-year university, a 1% increase in tuition for a public, four-year college yielded a 0.23% and 0.62% increase in enrollment for in-state and out-of-state students, respectively (Curs & Singell, 2002). Discrepancies exist in predicting relationship between a \$100 increase in tuition at multiple public colleges and universities and enrollment; the increase may decrease enrollment by 0.63 percentage points (Berger & Kostal, 2002) to just under 0.23%, or 25 students, (Hemelt & Marcotte, 2011) with a third study predicting a enrollment loss equivalent to 0.5% (Kane 1994a). Increasing tuition to raise faculty salaries by \$1,000 only resulted in a 0.2 percentage point increase in enrollment (Berger & Kostal, 2002). Kane (1994b) found that a tuition reduction of \$1,000 produced a 3.7 percentage point increase in enrollment.

The value of high cost, high financial aid models changes based upon the type of award, family income, student ability, and organizational context. At one college, a \$100 increase in merit aid increased the chance of graduation by 10%; whereas, a \$100 increase in loans led to a 2.7% increase in stopping out (DesJardins, Ahlburg, & McCall, 2002). To maximize financial aid support and increase the probability of completion, a low income, high ability student should attend a high quality college or university. In this case the student will gain \$1,710 for every \$10,000 decrease in household income and \$4,278 for every 100 point increase in SAT points at a high quality college or university (Epple, Romano, & Seig, 2006). Despite an overall lower net cost, low income students (i.e., family income less than \$21,544) attending a high cost, highly selective college ended up dedicating 45% of family income to higher education expenses whereas

students from high income families (above \$81,670) paid 21% of family income (Hill & Winston, 2006).

Enrollment, persistence, and completion are associated with financial aid, race, debt, and college type. The differential effect of financial aid on college attendance may occur because a \$10,000 increase in family income reduces the chances of receiving a scholarship by five, eleven, and seven percentage points for Black, Hispanic, and white students, respectively (Jackson, 1990). A 10 point increase in test scores increases the probability Black students (10.8 percentage points), followed by Hispanic students (6.8 percentage points), and white students (6.6 percentage points) will earn a scholarship (Jackson, 1990).

Another study suggests low completion rates may be influenced by high rates of dependence on loans for low-income and Black students (Kim, 2007). Findings from an earlier study attribute the loss of enrollment for black students during the 1970s and 1980s to a 45% increase in tuition rates and a 13% decline in value of Pell Grants (Kane, 1994). For every \$1,000 increase in direct costs to students, a five percentage point decline in enrollment was observed with students in the lowest income quartile experiencing an nine percentage point decline in enrollment (Kane, 1994).

Affirmative Action in American Colleges

The years long effort to make colleges accessible to previously excluded racial groups began following the signing of the Civil Rights Act of 1964 (Tyack & Cuban, 1995). The implementation of affirmative action in American colleges did not proceed without tension (Harper, Patton, Wooden, 2009). White students have challenged the affirmative action in admissions (*Bakke v. University of California*, 1978, *Hopwood v.*

University of Texas, 1998, *Grutter v. Bollinger*, 2003, *Gratz v. Bollinger*, 2003, *Fisher v. University of Texas*, 2013). Black students grieved unfair testing practices and the actions of the U.S. Department of Health, Education, and Welfare (*United States v. Fordice*, 1991). Eventually, federal courts defined standards for the appropriate use of race in college admissions. Conflicts over the use of race in college admissions decisions continue today.

In 1972, The National Association for the Advancement of Colored People (NAACP) filed a lawsuit against the U.S. Department of Health, Education and Welfare for not sufficiently enforcing the tenets of the Civil Rights Act of 1964 in ten states (*Adams v. Richardson*, 1973). The lawsuit was filed two years after HEW determined that the states of Louisiana, Mississippi, Oklahoma, North Carolina, Florida, Arkansas, Pennsylvania, Georgia, Maryland, and Virginia had either refused to submit a desegregation plan or had inadequate desegregation plans submitted. During the legal proceedings, HEW said negotiations were ongoing with the states so no administrative sanctions or legal action was taken (*Adams v. Richardson*, 1973).

In February 1973, U.S Federal judge John H Pratt ruled in favor of the NAACP. The court ordered HEW to monitor the efforts of desegregation in the 10 states for a three-year period. *Adams v. Richardson* (1973) ended by describing enforcement expectations for the HEW department. The value, legacy, and impact of Adams on organizational behavior, access, and equity remains uncertain. Olivas (2013) contends the *Adams consent decrees* sought to end segregation by encouraging cross-racial enrollment at both primarily white institutions (PWI) and Historically Black Colleges and Universities (HBCUs) even though implementation was slow. Conrad and Weertz

(2004) make the claim that states largely ignored the federal mandate. Within four years of the initial ruling, Judge Pratt ruled the desegregation plans were ineffective (Conrad & Weertz, 2004). In spite of the judicial findings, HEW continued to use the desegregation plans for states and in 1985 the federal government decided only 14 states had achieved desegregation in higher education (Conrad & Weertz, 2004).

The first legal challenge to affirmative action by a white plaintiff emerged when Allen Bakke was denied admission to medical school at the University of California – Davis for two consecutive academic years in 1973 and 1974. In 1976, The United States Supreme Court accepted the case on appeal from the Supreme Court of California. Four years after the initial rejection, the United States Supreme Court determined the admission practices used by the University of California – Davis for entry into the medical school violated the equal protection clause. The court rejected the admission plan used by the medical school because “it cannot be said that the government has any greater interest in helping one individual than in refraining from harming another.” (*Bakke v. the University of California*, 1978)

The significance of the *Bakke* case is undisputed. Colleges and universities across the nation are not and could not use enrollment quotas or special admission procedures to enroll a diverse student body. The majority opinion in *Bakke* stopped short of denying colleges and universities the ability to consider race as a “plus factor” in college admission decisions (Olivas, 2013). Additionally, *Bakke* limited the analysis of future reverse discrimination lawsuits to how race was used in selective admission decisions. The court determined future cases of illegal college admissions processes needed to be evaluated using “strict scrutiny” because “there is no principled basis for deciding which

groups would merit ‘heightened judicial solitude’; if anything less were selected, “Courts would be asked to evaluate the extent of prejudice and consequent harm suffered by various minority groups.” (*Bakke v. the University of California*, 1978). *Bakke* set the stage for future lawsuits contesting the use of race in college admission decisions (Olivas, 2013).

In 1975, 12 years after the implementation of a prejudicial testing policy, a group of Mississippi students gained the support of the federal government in an effort to challenge the standardized test scores required for admission to the three flagship colleges. When the lawsuit was filed, Mississippi colleges remained segregated because the average black student scored a seven on the ACT and the minimum score required for admission at the flagship colleges was a 15 (*United States v. Fordice*, 1992). In the course of the 17-year lawsuit, Mississippi attempted to maintain de jure segregation by offering “separate but equal” programs and classes at the HBCUs and Predominately White Institutions (PWI) and classifying a college as “comprehensive, urban, or regional” (*United States v. Fordice*, 1992). For the initial twelve years of the lawsuit, both sides sought “to achieve a consensual resolution of their differences through voluntary dismantlement by the State of its prior separated system” (*United States v. Fordice*, 1992). By 1987, consensus about whether or not a desegregated system existed had not been reached so a trial in a United States District court began. While the federal district and appellate courts found that the state had fulfilled its obligations to desegregate the higher education system, in an eight to one decision, the United States Supreme Court determined Mississippi had not effectively taken steps to dismantle a segregated higher education system (*United States v. Fordice*, 1992)

The social value and relative degree of social change following *Fordice* on desegregation initiatives appears limited. Olivas (2013) contends the length of adjudication in *Fordice* coupled with the system's resistance suggests that the success of "minority groups to bring systemic, large-scale lawsuits seeking equity" is limited (p. 53). Johnson (1993) criticizes the Supreme Court's positions in *Fordice* because the case sought to force integration without providing "a transitional stage in which racial differences are truly respected" (p. 1401). Similarly, Jones (1993) argues the *Fordice* decision positions the courts in direct challenge to the operation of publicly funded HBCU's. Sum, Light, and King (2004) indicate a balance between closing HBCU's and integration may have been reached when the *Fordice* decision required a \$500 million settlement for Mississippi HBCU's to integrate non-black students.

The *Fordice* ruling teaches us the criteria for evaluating if a dual system of higher education exists in a state. The justices concluded the cumulative effect of admission practices, program duplication, and mission assignments impeded desegregation in Mississippi public colleges. In the majority opinion we learn that admission criteria that disproportionately qualify one racial group (72% of white high school graduates) at the expense of another racial group (30% of black high school graduates) fails to satisfy the states obligation to desegregate an educational setting (*United States v. Fordice*, 1992).

Two scholars demonstrate that there was modest if any progress toward integration following *Fordice*. Minor (2008) compared Mississippi and North Carolina enrollment patterns and found that while both states remain highly segregated, white enrollment at HBCU's remains relatively flat, and black enrollment has increased at a higher rate in Mississippi. Sum, Light, and King (2004) contend white students avoid

HBCU's because of "perceived poor academic quality, social discomfort, anticipated discrimination, and parental approval" (p. 403).

Hopwood v. The University of Texas (1996) was filed because four white students with higher test scores and undergraduate GPAs were denied admission to the University of Texas law school in 1992. The US District Court found the admission practices used by the university violated the 14th amendment because the use of race was not "narrowly tailored." The students appealed to the Fifth Circuit appellate court because the use of race was still allowed in admission decisions. In 1996 the appellate court ruled that race could not be used in admission decisions for the states of Texas, Louisiana, and Mississippi. The United States Supreme Court refused to hear an appeal filed by the university in 1996.

Two lawsuits involving the University of Michigan made their way to the U.S. Supreme Court in 2003 (*Gratz v. Bollinger & Grutter v. Bollinger*). In 1994, *Gratz* (2003) was denied admission to an undergraduate program in the College of Literature, Arts, and Sciences. Two years later, *Grutter* (2003) was denied admission after being waitlisted for the University of Michigan School of Law. The two lawsuits were filed in 1997 against the University of Michigan by The Center for Individual Rights. In the process of the lawsuits, the programs started using a points system to make admissions decisions. The district court hearing the *Gratz* (2003) case ruled in favor of the new points system used by the College of Literature, Arts, and Sciences and banned the prior admissions program because it violated the 14th Amendment. The District court hearing the *Grutter* (2003) case ruled against the new admission program because using race in admissions violated the 14th Amendment. The Sixth Circuit court of appeals reversed the

district court finding in the *Grutter* (2003). On appeal the United States Supreme Court, the points system was struck down but the use of race in admission decisions was upheld (*Gratz*, 2003). In 2003, all colleges in America became able to use race as factor in a narrowly tailored admission decisions for the purpose of enrolling a diverse student body.

Following the *Grutter* (2003) and *Gratz* (2003) rulings a plethora of research on the benefits of enrolling a diverse student body was published. In a meta-analysis of the research, Bowman (2010) found that “several types of diversity experiences are positively related to several cognitive outcomes, but the magnitude of the effect varies substantially depending on the type of diversity experience, the type of cognitive outcome, and the study design” (p. 4). For example, Antonio et al. (2004) report that enrolling a diverse student body improves critical thinking skills for individual students. Enrolling a diverse student body is found to increase feelings of belonging for Black students (Strayhorn, 2008). Denson & Chang (2009) saw an increase in self efficacy when students attended a college with higher numbers of “underrepresented students” (p. 21).

We have learned through *Bakke*, *Hopwood*, and *Gratz* that quotas, separate evaluation, and points based models do not meet the legal standards for the use of race in college admissions articulated by the Supreme Court. Instead, admission plans must “consider race or ethnicity as a “plus’ in a particular applicant’s file,” without “insulating the individual from comparison with all other candidates for the available seats” (*Grutter v. Bollinger*, 2003). Designing a wholistic review process for undergraduate program has proven a challenge. Following the Hopwood decision, the state of Texas implemented a program that based admission decisions on high school

performance. Any student graduating in the top 10% of their high school class was guaranteed admission to any public college within the state of Texas, this included Texas A&M and the University of Texas at Austin. Research on the new admission model in Texas demonstrates mixed results on the effectiveness. Harris & Tienda (2010) examined enrollment patterns at the two flagship colleges in the state, only to find that Hispanic and Black representation had not recovered to the pre-*Hopwood* levels after the Top 10% plan had been implemented for four years. Long and Tienda (2008) supplement this finding by evaluating the shift in enrollment at three institutions and reporting the change in policy did not maintain enrollment for Black and Hispanic students. Niu & Tienda (2010) contend the differential results may be due the different data sources used by researchers. In an effort to minimize the effect of data sources and analysis, Niu & Tienda (2010) use survey data and regression to find the policy has the potential to reach the goal of “restoring ethno-racial diversity and broadening access to Texas’s public flagships” (p. 85).

The cause of the decrease in Black and Hispanic student enrollment is up for debate. Following an examination of California’s Proposition 209 and the Hopwood decision in Texas, Hicklin (2007) contends that institutional selectivity interferes with enrolling a diverse student body at a higher rate than the lack of Affirmative Action plans. Long, Saenz, and Tienda (2010) document an enrollment increase for students from small towns, rural areas, and midsize cities. Long and Tienda (2010) note an increase in the average the test score of applicants to less selective Texas colleges and universities. What we do know is the Top 10% plan does not allocate all of the

admission slots available to public institutions in Texas (*Fischer v. the University of Texas*, 2013).

In response to the *Grutter* and *Gratz* decision, Michigan voters passed Proposition 2 to ban the use of race in college admission decisions (Bernstein, 2013). A federal lawsuit was filed by a concerned group of citizens following the passage of a 2006 constitutional ban in Michigan against using race and gender in public education, employment and contracting (*Schuette v. Coalition to Defend Affirmation Action*, 2013). The case was heard on appeal from the Sixth Circuit Court of Appeals following a 2012 ruling that the state-wide constitutional ban violated the equal protection clause in the US Constitution. The final ruling by the US Supreme Court held that the state-wide ban on race in college admissions was legal and non-discriminatory. The relative social effect of *Schuette* has yet to be studied by higher education researchers. Instead, a single legal analysis analyzes the arguments used in the *Schuette* decision (Bernstein, 2013).

The fight for admission policies that support diversity did not end with the passage of constitutional bans. Abigail Fisher was denied admission in 2008 to the University of Texas at Austin under the 10% plan (*Fisher v. The University of Texas*, 2013). The US district court found that the admission plan at UT-Austin satisfied the legal criteria established by *Grutter* (2003). On appeal to the Fifth Circuit court, the admission plan was found legal and constitutional in 2010. In 2013, the US Supreme Court referred the case back to the Fifth Circuit appellate court to evaluate the admission plan using “strict scrutiny.” In 2016, the case made it back to the US Supreme Court after a second ruling by the Fifth Circuit Court of Appeals found the admission plan constitutional. In a four to three opinion, the Supreme Court found that the University of

Texas top 10% admission policy was narrowly tailored and in compliance with the legal mandates.

In *Hopwood*, *Grutter*, *Gratz* and *Fisher*, the assumption that qualified white students are being rejected to increase the number of Black, Hispanic, Asian American/Pacific Islander, and Native American students drives the filing of lawsuits. Hughes, Thompson Dorsey, and Carrillo (2015) elected to test the “causation fallacy” (i.e. white and Asian American/Pacific Islander students are being rejected so Black and Hispanic students can be admitted) at four selective institutions (Harvard, University of Michigan, University of North Carolina, and University of Texas). The findings suggest that the numbers of accepted Blacks and Hispanic students do not “cause” the rejection of white applicants or reduce the probability of admission for white or Asian American/Pacific Islander students (Hughes, Thompson Dorsey, and Carrillo, 2015).

Researching Enrollment Trends and Patterns

Enrollment studies may be categorized into four different types – studies of enrollment trends (Astin 1985; Astin & Oseguera, 2004; Bowen, Kurzweil, & Tobin, 2005), studies of enrollment determinants (Golden, 2007; Massey et. al, 2003), studies of individual enrollment decisions (Manski & Wise, 1983; Mullen, 2010), and enrollment forecasting (Bowen & Bok, 1998). Studies on enrollment trends focus on enrollment patterns over time and/or macro influences on college-going behavior. Ahlburg, McPherson, and Schapiro (1994) differentiate between studies that identify the “determinants of enrollment” through hypothesis testing and studies seeking to engage in enrollment forecasting – “the search for a universal model that is best for all groups at all

times” - through the use of trend and simulation models (p. 15). College choice research explains why or how individuals decide to enroll in post-secondary education.

Enrollment Trends

In an effort to link excellence and equity, Astin (1985) reports descriptive statistics from cross-sectional and panel data on educational opportunity at different types of higher education institutions; enrollment is compared for the individuals coming from the lowest quintile of socioeconomic status in 1966 and 1983. Astin (1985) concludes “minority students and students from poor families tend to enroll at institutions with fewer resources than do white students and students from well-to-do families” (p. 89).

There is also a gap in enrollment gap by race (Bowen, Kurzweil & Tobin, 2005). “In 2001, around 65% of white 16-to 24-year olds had enrolled in college compared to about 55% of Black students and just under 50% of Hispanics of the same age” (Bowen, Kurzweil, & Tobin, 2005, p 75-76). The explanations for the enrollment gap vary. Bowen, Kurzweil & Tobin (2005) attribute differences in family income as the basis for the enrollment gap. Massey et. al (2003) attribute the enrollment differences to parental educational attainment, segregation, parenting styles, and academic preparation. Bowen & Bok (1998) attribute the enrollment gap to “continuing disparities in pre-collegiate academic achievement . . . coupled with the extraordinary quality of the applicant pools available to most selective colleges and universities” (p. 51).

This and other descriptive studies using time-series data help identify changes over time (see, for example, Astin & Oseguera, 2004). Without the use of regression analysis or econometric modeling, the reader must infer why the changes occurred or factors influencing enrollment behavior. On the other hand, the findings on the

frequency distribution of application, admission, and enrollment in elite colleges and universities of the 1995 cohort focused on by Bowen, Tobin & Kurwell (2005) cannot be generalized beyond that specific cohort. Again, the reader may be left to infer how the behavior of the 1995 cohort is similar or different from other entering classes. For example, the data presented in Bowen & Bok (1998) and Massey et. al (2003) could have been useful in determining the similarities and differences between the 1989, 1995, 1998 C&B cohort of college but the three studies used different colleges in the sample. Bowen & Bok (1998) reported data on five colleges in the C&B sample and Massey et. al (2003) added a college to the sample.

Similar to the seminal works on higher education enrollment, research on enrollment trends utilize different units of analysis, study different segments of the American higher education system, and use a wide spectrum of data types and methodologies. The majority of enrollment trend research utilizes either panel or time-series data sets with descriptive, quantitative data analysis (Astin, 1998; Bastedo & Gumport, 2010; Goldhaber & Peri, 2007; Harris & Tienda, 2010; Haveman & Wilson, 2007), OLS or multiple regression (Bastedo & Jaquette, 2011; Chitiyo, 2008; Engberg, 2012), or econometric modeling (Aadland, Godby, & Weichman, 2007; Alon, 2009; Bahr, 2009; Dynarksi, 2003; Epple, Romano, Seig, 2006; Ewing, Beckert, and Ewing, 2010; Heller, 1999; Hicklin, 2007). Scholars have studied enrollment trends in community colleges (Frentzos, 2005; Goldhaber & Peri, 2007; Bahr, 2009; Taylor et. al, 2009; Pennington, McGinty, & Williams, 2010), elite colleges (Golden, 2007; Karen, 1991b; Posselt et. al, 2012), metro areas (Paul, 1990), public colleges (Harris & Tienda, 2010; Heller, 1999; Hicklin, 2007), private colleges (Epple, Romano, & Seig, 2006), and

the U.S. higher education system (Alon, 2009; Anderson, 2003; Bastedo & Jaquette, 2011; Dellas & Sakellaris, 2003; Engberg, 2012; Hearn, 1988a; Kane, 1994).

Enrollment Determinants

Studies of enrollment determinants have some similarities and differences from studies on enrollment trends. Scholars researching enrollment determinants have included a more balanced portfolio of data types – cross-sectional (Bishop & Van Dyk, 1977; Hearn, 1984, 1988, & 1991), panel data (Carbonaro, Ellison, & Covay, 2011; Y. Chen, 2012; Hicklin & Hawes, 2012), and time-series (Berger & Kostal, 2002; Galper & Dunn, 1969) – when compared with studies on enrollment trends. Yet, studies on enrollment determinants are much more likely to rely on OLS or multiple regression to test their hypotheses (Berger & Kostal, 2002; Bishop & Van Dyk, 1977; Carbonaro, Ellison, & Covay, 2011; Y. Chen, 2012; Galper & Dunn, 1969; Hearn, 1984, 1988, & 1991).

Attewell & Lavin (2007) introduce a new data source and methodology while examining the value of education across generations. Rather than using data on entering freshmen class to predict enrollment, Attewell & Lavin (2007) examine the relationship between parental education and college enrollment by following a cohort of women who enrolled in the City University of New York during the 1970s (CUNY dataset) or completed the National Panel Study of Youth (NLSY79) for a 30 year time period. The data from CUNY allowed Attewell & Lavin (2007) to examine the role of partial college completion on the enrollment of children. Adding the NLSY79 data reduced the sample bias and introduced a control group because the sample included individuals who did not pursue post-secondary education in the 1970s.

To minimize the selection bias inherent with OLS and multiple regression, Attewell & Lavin (2007) built a “counterfactual model of causal inference” by using enrollment forecasting, propensity scoring, and sample selection followed by OLS or logistic regression on both the control and treatment group. Counterfactual models “assure that both groups are identical on all background characteristics, so that any difference subsequently observed between the control and treatment groups on an outcome is attributable to the treatment alone” (Attewell & Lavin, 2007, p. 210). At the same time, the counterfactual model does not reduce the possibility of violating the assumptions required for OLS and multiple regression. Counterfactual models of causal inference using OLS and multiple regression could still leave out relevant independent variables and/or select an independent variable correlated with an error term in the propensity score-matched OLS and logistic regressions.

The use of fixed effects regression on enrollment determinants is emerging. Using “a GLS random-effects model with robust standard errors clustered by state,” Hicklin and Hawes (2012) find minor support for the volume of high school graduates and the amount of financial support on college enrollment with conditional influences between the political environment (i.e. Affirmative Action policy, legislative representation), bureaucratic structure (selectivity, faculty/staff composition, and governance) and enrollment.

Panel data-sets open up new opportunities for data analysis – entity fixed-effects and time fixed-effects regression (Stock & Watson, 2007). The advantage of using fixed-effects modeling occurs because assumptions for OLS and multiple regression have been relaxed by eliminating the potential for multicollinearity and auto-correlated errors. Two

new assumptions must be met prior to using fixed effects modeling; “the variables for one entity are distributed identically to, but independently of, the variables of another entity,” and “the errors in the fixed effects regression model are uncorrelated over time, conditional on the regressors” (Stock & Watson, 2007, p. 365).

In some cases, random effects regression produces more accurate results when compared to fixed effects regressions. Fixed effects regression estimands are accurate when “the data exhaust the population” (Kennedy, 1992). Random effects regression should be used when a sample of “observations from a large population” are used because random effects regression “saves many degrees of freedom” (Kennedy, 1992). Bias may occur with random effects regression because random effects regression assumes “that unobserved institution factors are uncorrelated with the explanatory variables” (Hearn & Rosinger, 2014).

The use of random effects regression to understand college enrollment is relatively rare. Hearn & Rosinger (2014) used random effects regression to evaluate the conditions that foster socio-economic diversity at 80 selective colleges and universities. A 1% tuition increase reduced enrollment of Pell eligible students by 0.04 percentage points (Hearn & Rosinger, 2014). A 1% increase in institutional grant aid increased the enrollment of low SES students by 0.03 percentage points (Hearn & Rosinger, 2014). Following a Hausman test, Wetzel, O’Toole, and Peterson (1998) reported random-effects estimands on the effects of price sensitivity on Black and white student enrollment at a large, urban, public university. Black student enrollment increases by 10% while white student enrollment increases by 6% when net costs decreased by \$1,000 Virginia Commonwealth University (Wetzel, O’Toole, & Peterson, 1998).

Summary

Prior research suggests federal funding, state funding, tuition costs, affirmative action case law and the resulting changes in college admission practices influence enrollment and completion rates at American colleges and universities. Scholars have used cross-sectional, time-series and panel data sets to examine and analyze changes in enrollment and completion with different sampling strategies. Ordinary Least Squares regression analyses are the most common way to study enrollment determinants. Fixed effects regression models are becoming more common. We rarely see the utilization of random effects regression to study changes in enrollment determinants.

CHAPTER 3

Research Design

My goal is to understand how changes in federal law and policy influence the enrollment and completion rates of a racially diverse student body in selective four-year colleges. To do so, I assembled a panel data from a select set of US colleges from 1990-2013. I rely upon a set of variables available in IPEDS to estimate the relationship between school finance, federal Affirmative Action lawsuits, tuition, and college control on the enrollment and completion rates for a diverse student body (see Table 6 for a description of each variable).

To identify selective colleges, I determined average SAT test scores and college admission rates using Barron's categories of selectivity. Then I displayed data trends for enrollment rates, completion rates, federal spending, state spending, tuition, control, and affirmative action case law. Finally, I used the panel data set for a GLS model with institutional level random fixed effects to demonstrate the association between enrollment rates and completion rates over time and organizational spending, state and federal funding, affirmative action case law. I conducted the fixed effects regression analysis to help understand the various changes that could be made to increase the enrollment and completion of a diverse student body.

Data Source

The Integrated Post-Secondary Education Data Set (IPEDS) is a detailed dataset that contains variables related to enrollment, tuition and fees, degree completion, and school finance that are collected annually through multiple surveys. IPEDS replaced the

Higher Education General Information Survey in 1986. Data has been collected and publicly reported by the US Department of Education for every year since. All colleges that receive Title IV federal financial aid funding are required to report data annually to maintain program eligibility.

To construct indicator variables for affirmative action court cases I turned to Lexis Nexis Academic to locate the publication date for circuit, appellate, and Supreme Court opinion dates for federal affirmative action cases pertaining to college enrollment.

Constructing a Measure of Selectivity – Defining the Sample

IPEDS contains admission data and test scores for colleges and universities from 2001-2012. Year-to-year variation in admission rates and test scores limited my ability to consistently select a sample of selective colleges based upon IPEDS data only. To create a consistent sample of selective colleges, I calculated their average admission rates and ACT scores (composite, English, and Math), and SAT scores (reading & math) using IPEDS data for colleges classified as “most competitive”², “highly competitive”³, and “very competitive”⁴ by Barron’s⁵ in 2001 & 2012. To get a stable measure of selectivity

² Colleges in the “most competitive” category usually enroll students in the top 10-20% of high school class, high school grades above a B+, SAT test scores between 655-800, or ACT scores above 29.

³ Highly competitive schools accept approximately 25% of applicants and students usually have a B average for high school grades, place into the top 20-35% of a graduating class, SAT scores between 620-654, or ACT scores between 27 or 28.

⁴ Very competitive colleges accept less than 33% of applicants and usually select students who earn a B- or higher, place into the top 35-50% of a high school graduating class, score between 573-619 on SAT tests, or 24 to 26 on the ACT.

⁵ Every year Barron’s uses a proprietary ranking system to categorize the selectivity of approximately 1,600 colleges annually. The ranking system includes six groups (most

over time, I calculated three group averages (most competitive only, most & highly competitive, and most, highly & very competitive) for each selectivity category in 2001 (see table 2) and 2012 (see Table 1). The tables below include the group average and in parenthesis the number of colleges reporting data or included in the Barron's category.

Table 1

Average Admission Rates, SAT and ACT Test Scores for Selective Colleges in 2012

2012						
Barrons Group	Admission Rate	SAT Reading	SAT Math	ACT	ACT Math	ACT Reading
Most Competitive (83)	27.47 (83)	632.76 (76)	647.63 (76)	29 (74)	28 (51)	29 (51)
Highly & Most Competitive (186)	43.47 (186)	589 (163)	609 (163)	27 (156)	26 (116)	26 (116)
Most, highly, Very competitive (452)	56.84 (452)	537 (390)	549 (396)	24 (395)	23 (319)	23 (320)
All Observations (3108)	66.41 (1800)	470 (1219)	479 (1231)	20 (1264)	19 (1085)	19 (1086)

Note. Author's calculations using published data from the Integrated Post-Secondary Education Data System.

Table 2

Average Admission Rates, SAT and ACT Test Scores for Selective Colleges in 2001

2001						
Barron's Group	Admission Rate	SAT Reading	SAT Math	ACT	ACT Math	ACT Reading
Most Competitive (59)	31.86 (56)	626 (52)	644 (52)	28 (22)	27 (14)	27 (14)
Highly & Most Competitive (151)	48.21 (142)	591 (133)	603 (133)	26 (77)	25 (42)	25 (42)
Most, highly, Very competitive (389)	62.66 (366)	546 (310)	553 (310)	23 (233)	22 (151)	22 (151)
All Observations (2524)	72.70 (1600)	482 (937)	482 (938)	20 (816)	18 (594)	19 (596)

Note. Author's calculations using published data from the Integrated Post-Secondary Education Data System.

competitive, highly competitive, very competitive, competitive, less competitive and noncompetitive). Placement into each category varies from year to year.

I also evaluated the consistency of admission rates and test scores for each group in 2001 and 2012 (see table 3).

Table 3

Percent Change in Admission Rates and Test scores by Selectivity, 2000–2012

Variable	Highly & Most, Highly			
	Most	Most	& Very	All
	Percent Change			
Admission Rate	13.78%	9.83%	9.29%	8.65%
SAT Reading	-1.12%	0.34%	1.65%	2.49%
SAT Math	-0.62%	-1.00%	0.72%	0.62%
ACT	-3.57%	-3.85%	-4.35%	0.00%
ACT Math	-3.70%	-4.00%	-5.56%	-5.56%
ACT Reading	-7.41%	-4.00%	-4.55%	0.00%

Note. Author’s calculations using published data from the Integrated Post-Secondary Education Data System.

The average SAT test scores and admission rates for the colleges classified as “highly and most competitive” by Barrons had the least amount of within-group variation between 2001 and 2012. Based upon the 2001 and 2012 average admission rates and SAT test scores, I defined a selective college as a college that accepted less than or equal to 45.8% of applicants or had SAT reading scores greater than or equal to 590 or math scores great than or equal to 606 (see table 4 for a comparison).

Table 4*Average Admission Rates and Test Scores Based upon Barron’s Categories of Selectivity*

	Most	Highly & Most	Most, highly & very	All
Admission Rate	29.7	45.8	59.8	69.6
SAT Reading	629.5	590	541.5	476
SAT Math	646	606	551	480.5
ACT	28.5	26.5	23.5	20
ACT Math	27.5	25.5	22.5	18.5
ACT Reading	28	25.5	22.5	19

Note. Author’s calculations using the Integrated Post-Secondary Education Data System.

Colleges only had to satisfy one of the inclusion criteria mentioned above (i.e. 45.8% admission rate, average SAT reading of 590, or average SAT math of 606) for one year to be included in the sample. The sample includes 897 selective four-year colleges⁶ (see Appendix A). The study includes approximately 25% of four-year colleges⁷. With the exception of Wyoming, every state is represented in the study. The sample includes 173 public, 493 private, and 204 for-profit colleges. Fifty-one colleges are designated as a Historically Black College or University (HBCU). Two colleges are affiliated with a tribal nation.

⁶ Seven hundred and forty-five colleges were included based upon one selection criterion; 33 colleges met two selection criteria, and 90 colleges met all three selection criteria. Of the colleges that satisfied one admission criterion, 737 were included because of admission rate, five were included due to SAT Math scores, and three were included for SAT Reading scores. Of the colleges meeting two inclusion criteria, 19 had the required admission rate, nine had the required SAT Math score, and seven had the required SAT reading score.

⁷ An alternative sampling strategy was explored using the average admission rates and SAT test scores based upon the Barron’s colleges categorized as “most,” “highly,” and “very” selective. Lowering the test score average and raising the admission rate would have expanded the sample by 466 non-selective colleges (see Appendix B).

Missing Data

While there are techniques for estimating missing data⁸, in this analysis I use an unbalanced panel data set. I was unable to impute missing data because of data irregularity from year to year. The imputation methods would have reduced the accuracy of the data analysis. Table 5 describes the total number of colleges with any data, number of colleges with data on enrollment by race, and the number of colleges with completion data by race. The data on enrollment by race is more complete than completions by race. The number of observations for enrollment and completion rates by whites exceeds that available for non-white student groups. As mentioned before, the missing data is random from year to year.

⁸ Imputation relies upon prior trends within the observed units and trends within similar organizations to create an estimated value. However, during the time period of the analysis, higher education as an industry experienced significant stratified growth. For some institutions, comparable units may be difficult to find which reduces the accuracy of imputation for missing data.

Table 5*Number of Observations Per Year*

Observations by variable and year (1990-2013)											
Year	Colleges	Enrollment					Completion				
		White	Black	Hispanic	Asian	Native American	White	Black	Hispanic	Asian	Native American
1990	885	683	618	618	618	618	556	520	455	452	257
1991	885	692	623	623	623	523	573	545	479	463	277
1992	886	705	479	479	479	479	589	390	345	340	177
1993	886	717	645	645	645	645	587	552	492	495	308
1994	886	720	644	644	644	644	598	562	518	504	314
1995	886	727	640	640	640	640	602	569	510	508	330
1996	886	716	641	641	641	641	611	578	525	507	325
1997	887	731	675	675	675	675	620	583	545	521	346
1998	889	742	674	674	674	674	635	677	662	646	577
1999	889	748	633	633	633	633	642	564	531	506	354
2000	891	759	714	714	714	714	655	701	701	701	701
2001	891	765	728	728	728	728	663	633	593	562	375
2002	891	772	740	740	740	740	673	639	607	567	394
2003	893	781	760	760	773	760	680	657	609	576	422
2004	890	789	773	773	785	773	692	671	632	601	429
2005	891	794	785	785	797	785	716	692	651	606	450
2006	890	808	797	797	810	797	724	694	657	617	446
2007	889	821	810	810	825	810	737	626	635	596	434
2008	887	837	825	825	831	825	746	NA	NA	NA	NA
2009	885	843	831	831	873	831	843	733	697	630	481
2010	883	862	868	873	870	868	770	758	731	675	472
2011	877	NA	866	870	869	866	797	780	741	670	469
2012	874	864	867	869	867	867	812	780	762	671	486

Note. Based upon author’s calculations using the Integrated Post-Secondary Education Data System.

Dependent Variables (i.e., Measures of Equity)

My dissertation assesses the conditions that foster the enrollment and completion of non-white students in selective colleges as measures of equity. The following sections describe how I calculated the enrollment and completion rate for white, Black, Hispanic,

Asian American/Pacific Islander and Native American students enrolled in selective colleges from 1990-2012. This period encompassed several changes in federal policy and affirmative action case law.

Student Body Diversity. Colleges report total undergraduate, fall enrollment along with the number of students considered to be of white, Black, Hispanic, Asian American/Pacific Islander & Pacific Islander, and Native American descent. Fall enrollment numbers include both full- and part-time students. I calculated the percentage of enrollment for each racial group by dividing the number of students per racial group by the total undergraduate fall enrollment. I created another dependent variable for fall enrollment by aggregating the percent of students from non-white students by adding the percent of Black, Hispanic, Asian American/Pacific Islander & Pacific Islander, and Native American students enrolled at each selective college.

Degree Completion. Any college participating in the federal financial aid program reports the total number of degrees awarded per calendar year and in accordance with a student's reported race. I calculated the percent of bachelor degrees for each racial group by dividing the number of bachelor degrees awarded per group by the total number of bachelor degrees awarded by the college. I added another dependent variable by aggregating the percent of bachelor degrees awarded to any student belonging to a non-white racial/ethnic group by adding the percentage of bachelor degrees awarded to Black, Hispanic, Asian American/Pacific Islander & Pacific Islander, and Native American students.

Independent Variables

While the implementation of legal mandates for admission is the primary focus area of my dissertation, the considering the effect of college finance, tuition and institutional control are equally important. My dissertation includes 15 independent variables (see Table 6). While most of this data is specific to a particular college in some instances, systems of colleges report data for all colleges. In these instances, I disaggregated the data by calculating a system total for the variables described below before dividing the system total by the percent of enrollment for a specific campus.

For school finance data, I aggregated survey responses to the GASB and FASB survey questions collected through the IPEDS annual survey (see Appendix C for procedures and survey components). To estimate tuition, I used a combination of IPEDS variables. For tuition costs from 1999 to 2012, I selected in-state average tuition for full-time undergraduate students. For tuition costs from 1990 to 1998, I used the IPEDS variable called tuition and fees, full-time undergraduate, in-state.

Finally, for the IPEDS financial data and tuition costs, I adjusted for inflation using the Consumer Price Index – all urban consumers (CPI-U), seasonally adjusted, 12-month net change published by the Bureau of Labor Statistics. All financial data reported is adjusted to 2012 dollars.

Table 6*Variable Descriptions*

Variable	Description
Dependent variables:	
Student body diversity	Percent of fall enrollment classified as White, Black, Hispanic, Asian or Pacific Islander, or Native American students
Degree completion	Percent of bachelor degrees award to White, Black, Hispanic, Asian or Pacific Islander or Native American students each calendar year
Independent variables:	
College revenues	2012 inflation adjusted dollars received by a college from public and private sources
Total revenues	Total revenues and other additions per enrolled student received during the fiscal year ending before October
Federal funding	Federal appropriations, operating grants and contracts, and non-operating grants and contracts per student received during the fiscal year ending before October
State funding	State appropriations, operating grants and contracts, and non-operating grants and contracts per student received during the fiscal year ending before October
College expenses	Per student dollars spent on college or university operations in 2012 inflation adjusted dollars
Total expenses	Total expenses and deductions spent per student during the fiscal year ending before October
Instructional costs	Per student compensation spent on academic instruction, occupational and vocational instruction, community education, preparatory and adult basic education, and remedial and tutorial instruction provided by teaching faculty in 2012 inflation adjusted dollars
Academic and student support services fees	Per student operating expenses associated with admissions; registration; emotional and physical wellbeing of students; intellectual, cultural, and social development outside of the classroom environment; and activities and services affiliated with instruction, research, and public service in 2012 inflation adjusted dollars.
Affirmative Action lawsuits	
Quantity of cases heard in federal courts	A continuous variable counting the number of circuit, appellate, and Supreme Court Affirmative Action decisions for a given academic year
Fordice	For the years before any court decision the variable was coded as 0. For the years following the appellate decision and before the Supreme Court ruling, the variable was coded as 2. For the years following the Supreme Court decision the variable was coded as 3.
Hopwood	Years prior to the court decision were coded as 0. For the years following the circuit decision the variable was coded as 1. For the years following the appellate decision the variable was coded as 2.
Adams	Years prior to the court decision were coded as 0. For the years following the circuit court decision the variable was coded as 1.
Grutter	Years prior to the court decision were coded as 0. For the years after the circuit decision and before the appellate ruling, they were coded as 1. For the years after the appellate ruling and before the Supreme Court ruling a code of 2 was entered. All years bound by the Supreme Court ruling were coded as 3.
Coalition	Years prior to the court decision were coded as 0. For the years after the circuit decision and before the appellate ruling, they were coded as 1. For the years after the appellate ruling a code of 2 was entered.
Fisher	Years prior to the court decision were coded as 0. For the years following the circuit decision the variable was coded as 1. For the years following the appellate decision the variable was coded as 2.
Tuition and fees	Current year tuition and fees charged to in-state students in 2012 inflation adjusted dollars
College control	A dummy variable classifying a college as public (1), non-profit private (2), or for-profit private (3)

Analysis

The goal of my analysis is to describe the changes in the key measures of equity (i.e. enrollment and graduation of non-white students at selective colleges) over time. To do this, I elected to use panel data because according to Stock & Watson (2007) panel data improves the reliability of findings by reducing sample bias and introducing controls

for “unobserved factors that differ from one state to the next but do not change over time within the state” (p. 354).

The model that describes the relationship between the state of equity in a particular college and factors that are potentially associated with it, presented below,

$$Y_{it} = \alpha + \beta X + \gamma Z + \delta W + \zeta C + \mu_{it} + \varepsilon_{it}$$

Here Y_{it} represents a state of equity in college i at time t , then, $\beta, \gamma, \delta, \zeta$ represent the conditional correlations of the state of equity with factors potentially associated with the outcome. For some of the analyses, Y_{it} measures the percent of fall enrollment by race or the percent of bachelor degrees awarded by race at college i in year t . α is the intercept, X is a set of variables measuring revenues and expenditures per student, Z is a set of dummy variables measuring changes in federal affirmative action case law, W represents academic year tuition and fees for in-state students, C is a set of dummy variables for college control, μ_{it} is a set of college fixed effects, and ε_{it} is the random error term. For this model X is a set of variables that includes total expenditures, instructional expenditures, academic support expenditures, student services expenditures and total revenue, federal revenue, and state revenue. Finally, dummy variables were included to account for the influence of college control (i.e. public, private, or for-profit) on the dependent variables.

For each regression model on enrollment and completion, natural logs were used in place of absolute dollars when estimating the effect of school finance data on enrollment rates and degree completion. For the enrollment regressions, school finance data was lagged one year from the IPEDS reporting data so the expenses and revenues aligned with enrollment trends. Since most college fiscal years end in October, a one

year lead for college expenditures and revenues were used for the degree completion regression analysis.

CHAPTER 4

Patterns and Trends in Higher Education

Over the 22 years under study, the total average enrollment per college was 3,422 students. The average enrollment for white students was 2,046 students per year. On average, a single college enrolled 489 Black, 337 Hispanic, 300 Asian American/Pacific Islander, and 20 Native American students. On average a college would award 634 degrees per academic year. On average 575 degrees were awarded to white students. The average college would award 64 degrees to Black students, 53 degrees to Hispanic students, 60 degrees to Asian American/Pacific Islander students, and three degrees to Native American students per year. The average college would take in about \$192 million per fiscal year. The average college would spend approximately \$163 million dollars per fiscal year. For more descriptive statistics please refer to Figure 1.

Enrollment Trends

The total number of students enrolled each academic year in selective, American colleges has increased by 870,463 students from 1990 to 2013. The average Fall class size ranged from a low of 3,234 students in 1995 to a high of 3,721 in 2013 (see Figure 2). In 1995 the year with the smallest average class size, the range of total student enrollment for the fall semester at a single selective college ranged between 2,862 students to 3,600 students. By 2013 the year with the largest class size average, colleges had increased fall enrollment to somewhere between 3,286 students and 4,156 students.

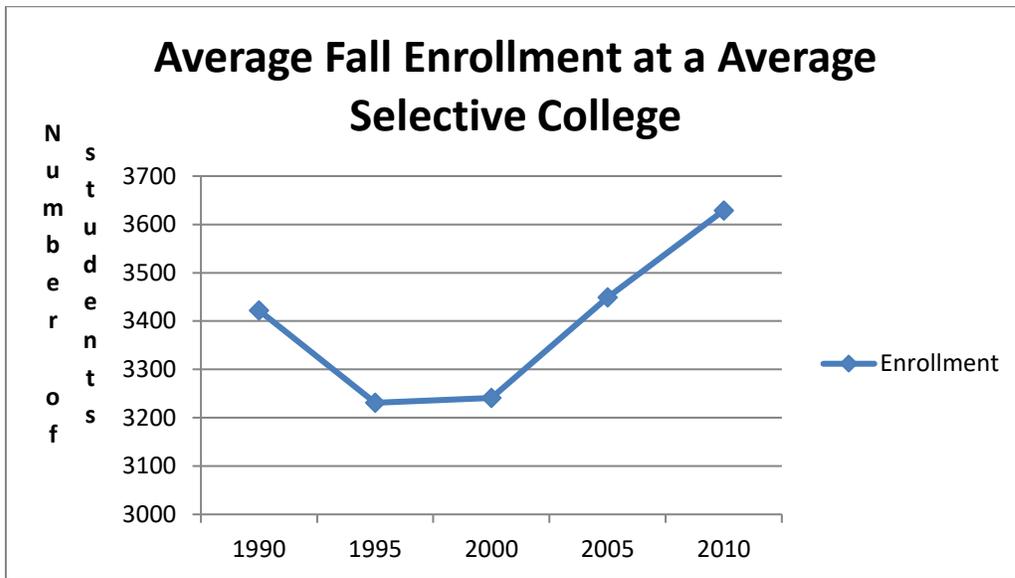
Figure 1*Descriptive Statistics for the Average College*

Descriptive Statistics			
	Mean	Standard Deviation	Range
Enrollment - Whole numbers	3422	5571.73	1 to 51,333
White Students	2,046	3582.02	0 to 40,504
Black Students	489	987.04	0 to 13,298
Hispanic Students	337	1071.63	0 to 31,477
Asian Students	300	988.63	0 to 12,513
Native American	20	58.21	0 to 1,218
Enrollment - percent			
White	62.47	27.1	0 to 100
Black	15.53	23.36	0 to 100
Hispanic	7.26	10.82	0 to 95.79
Asian	4.87	7.26	0 to 100
Native American	0.91	5.04	0 to 100
Completions - Whole numbers	634	1,168.26	0 to 45,371
White Graduates	575	1,634.86	0 to 45,371
Black Graduates	64	131.46	0 to 1,645
Hispanic Graduates	53	183.68	0 to 5,347
Asian Graduates	60	217.74	0 to 3,278
Native American Graduates	3	8.89	0 to 193
Completion - percent			
White	59.77	28.17	0 to 100
Black	13.84	23.44	0 to 100
Hispanic	6.65	10.98	0 to 100
Asian	5	7.85	0 to 100
Native American	0.77	4.88	0 to 100
Revenue - Whole dollars	192 million	601 million	0 to 10.2 billion
Federal	23.1 million	86.6 million	0 to 1.3 billion
State	21 million	70.5 million	0 to 886 million
Revenue - Per Student (2012 Whole Dollars)	67,131	404,121	0 to 24 million
Federal	5,570	23,151	0 to 572,481
State	3,785	17,448	0 to 576,215
Expenses - Whole dollars	163 million	488 million	0 to 6.35 billion
Instruction	48.8 million	136 million	0 to 2.15 billion
Support	21.8 million	56.3 million	0 to 1.05 billion
Expenses - Per Student (2012 Whole Dollars)	57,356	376,544	0 to 22.5 million
Instruction	15,137	37,428	0 to 1.8 million
Support	15,469	8,819	0 to 2.2 million
Tuition - per student (2012 whole dollars)	13,785	9,813.16	0 to 62,550

Note. Based upon author's calculations using IPEDS data.

Figure 2

Average Number of Total Undergraduates Enrolled by a Selective College, 1990-2010



Note. Author's calculations using data reported in IPEDS.

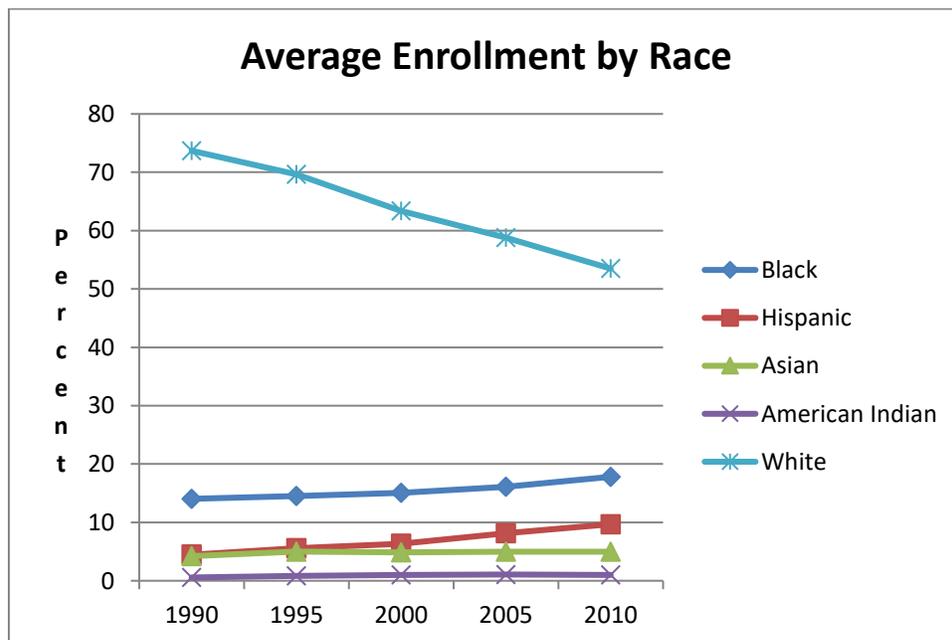
The percent of the student body comprised of white students has steadily declined from an average of 74% in 1990 to 51% in 2013. The decline of white student enrollment in selective colleges does not match demographic trends in the nation during the same time period. From 1990 to 2013, the number of 18-24 year olds living in the US increased from 26.9 million to 31.5 million (Musu-Gillette, et. al, 2016). From 2000 to 2013, the percent of white 18-24 year olds living in America decreased from 62% to 56% (Musu-Gillette, et. al, 2016).

In 1990 the year with the greatest percentage of white students, the white student body at selective colleges in the fall semester ranged from a low of 72% to a high of 76% at specific colleges. By 2013 the year with the lowest percentage of white student enrollment, the percent of student body that was white declined to a minimum of 49% at one college to a maximum of 53% at another. The average percentage of enrolled

students from non-white student populations has fluctuated from a low of 22% in 1992 to a high of 35% in 2013. By 1992, the fall enrollment for Black, Hispanic, Native American and Asian American/Pacific Islander/Pacific Islander students at a specific college ranged from a low of 20% to a high of 24%. By 2013, the enrollment of non-white students at selective college comprised anywhere from 34% to 37%. It is curious that the loss of white enrollment does not account for the relative gain of enrollment of students from non-white student groups during a period of growth (see Figure 3). This gap could be explained because an enrollment decline for all students was observed from 1992 to 2010.

Figure 3

Percent of Enrolled Students by Racial Group, 1990-2010



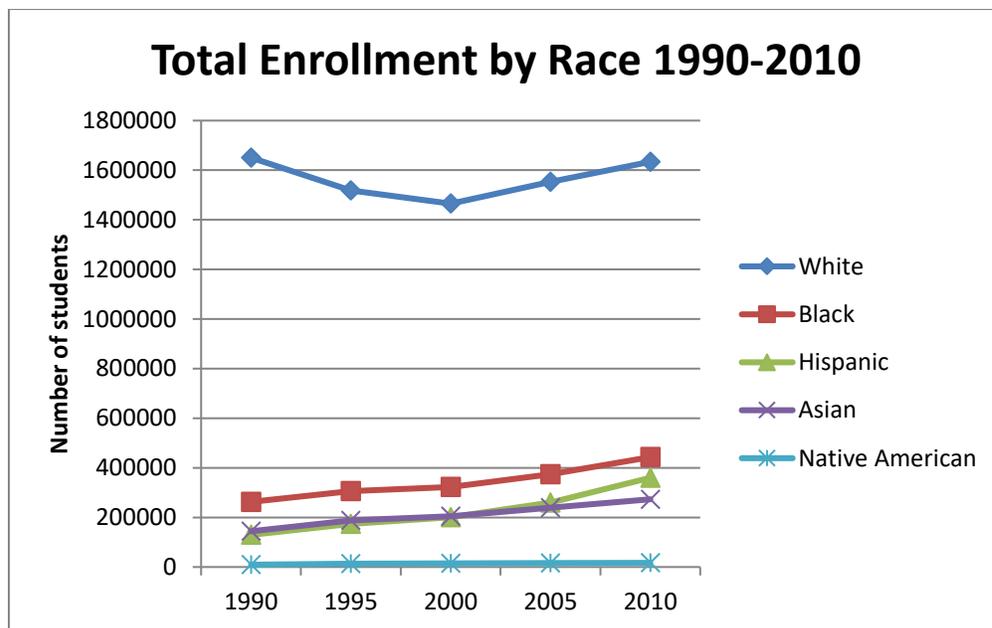
Note. Author's calculations using data reported in IPEDS.

The annual enrollment of white students at selective US colleges steadily declined from 1992 to 2010 (see Figure 4). During this declining enrollment selective colleges

enrolled a total of 40,675,159 white students. By 1999, the year with the lowest White student enrollment, selective colleges enrolled just over 1.4 million white students. During the same time period, selective colleges enrolled 5.5 million Black, 3.7 million Hispanic, 800,000 Asian American/Pacific Islander, and 252,000 Native American students. The enrollment of Black students increased from a low of 95,683 students in Fall 1992 to a high of 541,953 students in Fall 2009. With the exception of Fall 1998, Hispanic student enrollment annually increased from a low of 44,696 in Fall 1992 to a high of 386,621 students in Fall 2009. With the exception of Fall 1998, the enrollment of Native American students increased from 1992 (4,794 students) to 2009 (21,839 students).

Figure 4

Total Number of Students Enrolled in Selective Colleges by Racial Group, 1990-2010



Note. Author's calculations using data reported in IPEDS.

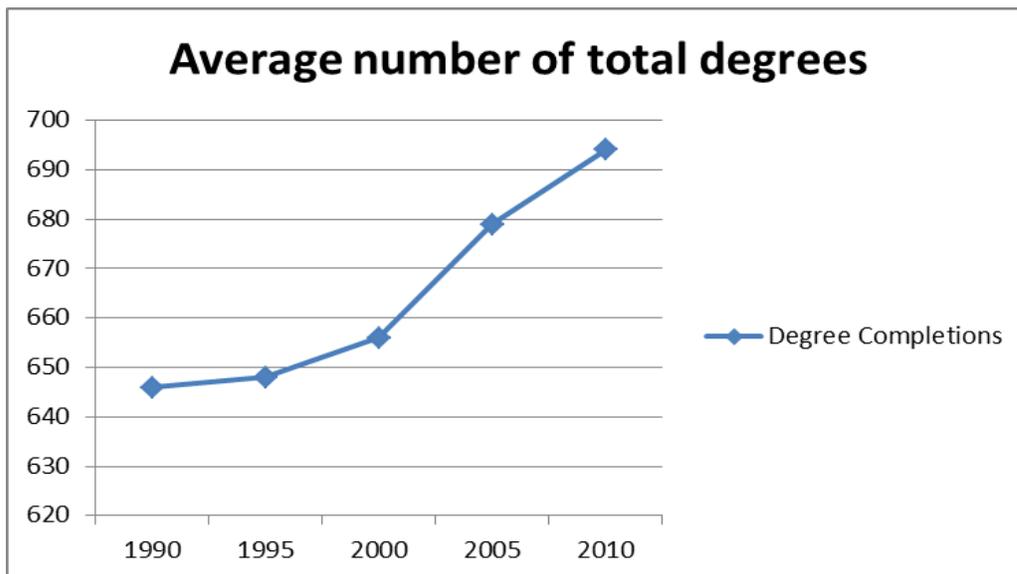
Selective colleges were far more likely to see an increase in Black and Hispanic student enrollment compared to Native American and Asian American/Pacific Islander students. Black student enrollment increased incrementally by 3.5% from 1994 to 2010. Hispanic student enrollment started increasing consistently after 2000. Over the next 11 years, the average share of Hispanic students increased by 3.6%.

Degree Completion

The total number of degrees awarded by selective colleges each academic year increased by 257,028 degrees from 1990 to 2013. Over the period under study, selective colleges averaged 634 degrees per academic year. The average number of degrees ranged from a low of 352 degrees in 1992 to an average high of 763 degrees in 2013 (see Figure 5).

Figure 5

Average Number of Bachelor Degrees Granted Per Academic Year by Selective Colleges

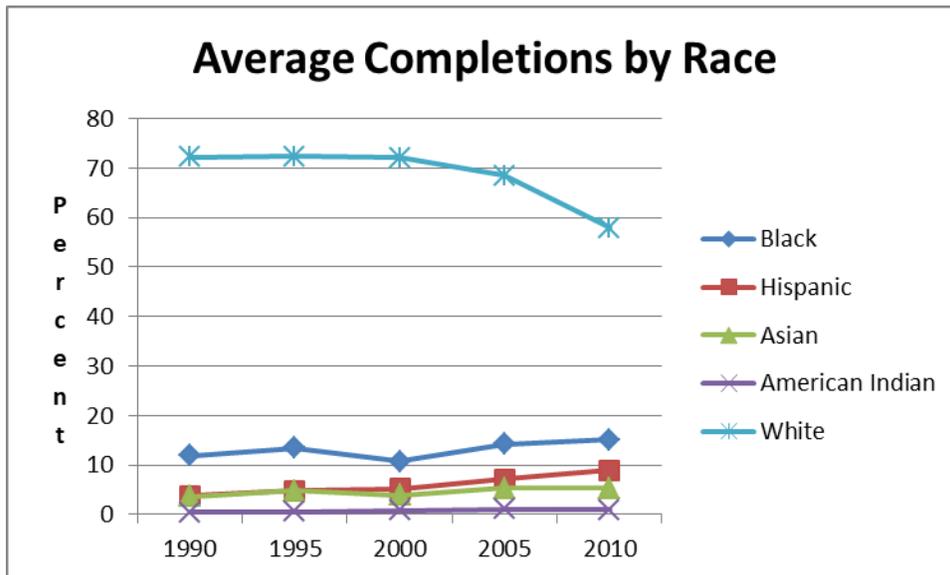


Note. Author's calculations based upon data published in IPEDS.

Similar to enrollment, the degree completion rate for white students has steadily declined from an average of 72.26% in 1990 to 56.29% in 2013. In 1990, the most diverse college awarded 69.51% of their degrees to white students. The least diverse college in 1990 awarded 75% of their degrees to white students. By contrast, the most diverse college in 2013 awarded 49% of their degrees to white students. The least diverse college in 2013 awarded 53% of degrees to white students. The average percentage of degrees awarded to students from racially marginalized groups has fluctuated from a low of 19% in 1990 to a high of 32% in 2012. The percent of degrees awarded to non-white students in 1990 ranged from a low of 17% of the graduating class to a high of 21% of graduating seniors. By contrast, the diversity of the graduating class increased from a low of 31% of seniors to a high of 34% graduates in 2012.

Figure 6

Percent of Bachelor Degrees Awarded to Graduates of Selective Colleges by Race



Note. Based upon author's calculations from data published in IPEDS.

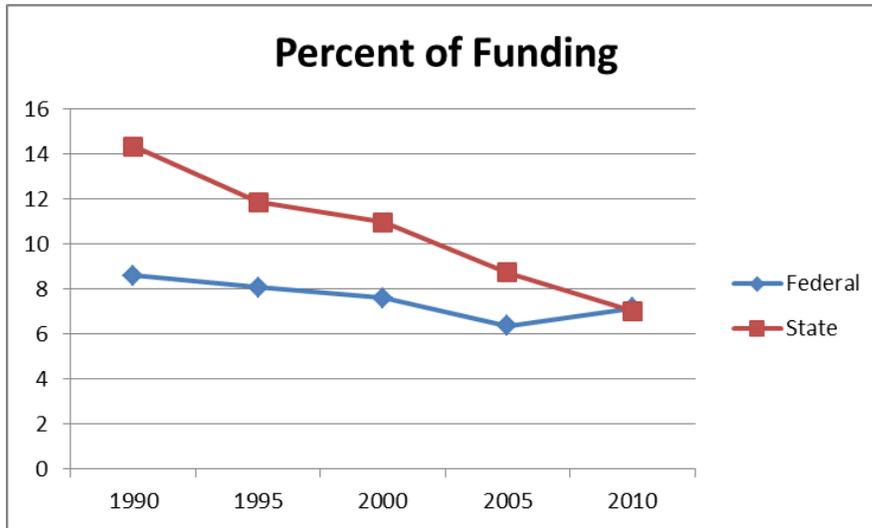
Selective colleges were far more likely to see an increase in Black and Hispanic student completion compared to Native American and Asian American/Pacific Islander students (see Figure 6). With the exception of 2007, the percent of Black students completing a degree increased steadily from an average of 13% of the graduating class in 1993 to 16% of the class in 2012 & 2013. In 2007, the percent of degrees awarded to Black students ranged from a low of 11% of the graduating class to a high of 15% of the class. By 2012 and 2013, the range of degrees awarded to Black students increased to a low of 15% to a high of 18% of the graduating class. Hispanic student degree completion increased from an average completion rate of 4% in 1990 to 10% in 2013. The percent of degrees awarded to Hispanic students by a single selective college in 1990 ranged from 3-4% of graduating seniors. By contrast, the percentage of degrees awarded to Hispanic students ranged between 9-11% in 2013.

Revenues, Expenses, and Tuition

The percent of the budget coming from federal and state appropriations, grants, and contracts slightly declined during the study (see Figure 7). The overall revenue and expenses per student increased exponentially during the study (see Figure 8). The per student revenue generated from federal sources increased while the per student revenue from state sources declined during the study period (see Figure 9).

Figure 7

Percent of Total Inflation-Adjusted State and Federal Revenues for Selective US Colleges

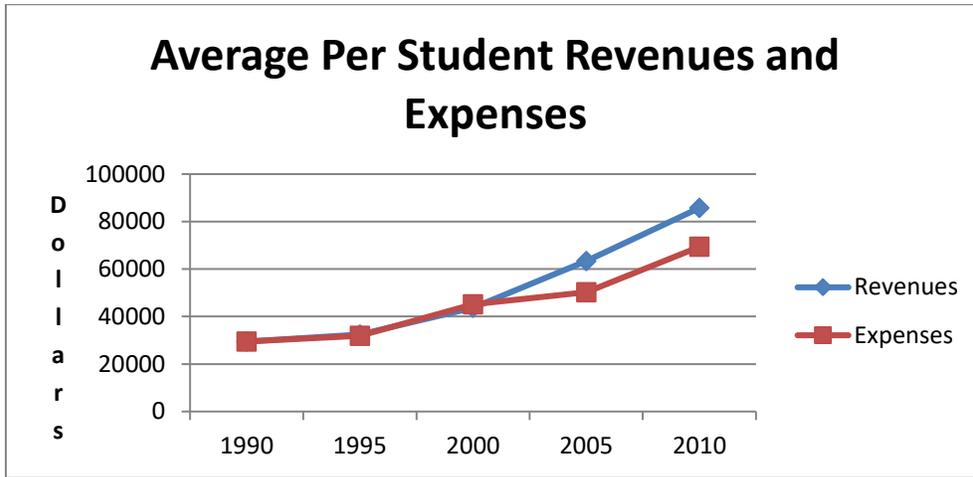


Note. Based upon author's calculations using IPEDS.

Prior to 1996, selective colleges received approximately 8% of their budget from federal appropriations, grants, and contracts. With the exception of 2001, selective colleges and universities generated between 6% and 8% of their revenues from federal sources. Through the years under study, selective colleges experienced a steady decline in the percentage of the budget coming from state appropriations, grants, and contracts. In 1990, selective colleges received an average of 14% of their budgets from their respective states. The range of state-based funding received by selective college since 1990 varied from 13-16% of the total revenue. By 2013, the average college received approximately 7% of revenues from the state.

Figure 8

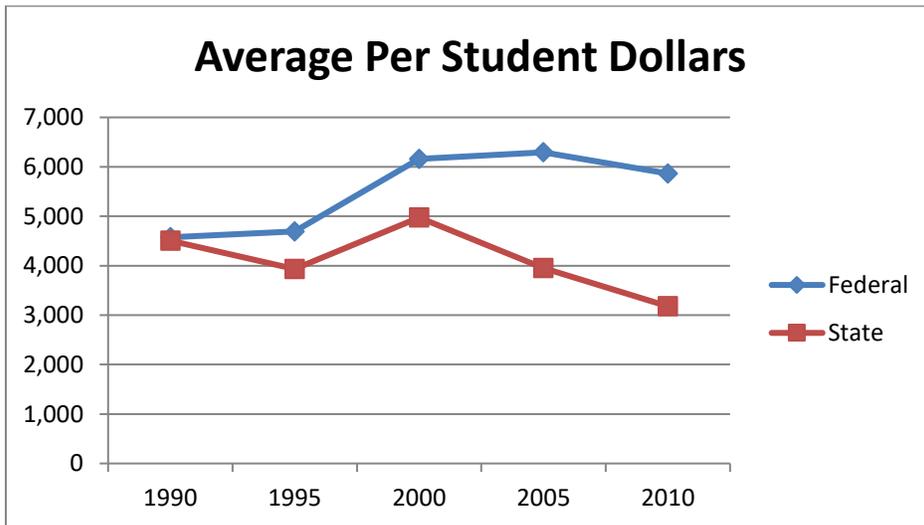
Average Per Student Total Revenues and Expenses at Selective Colleges



Note. Based upon author's calculations from IPEDS data.

Figure 9

Average Per Student Funding from State and Federal Sources

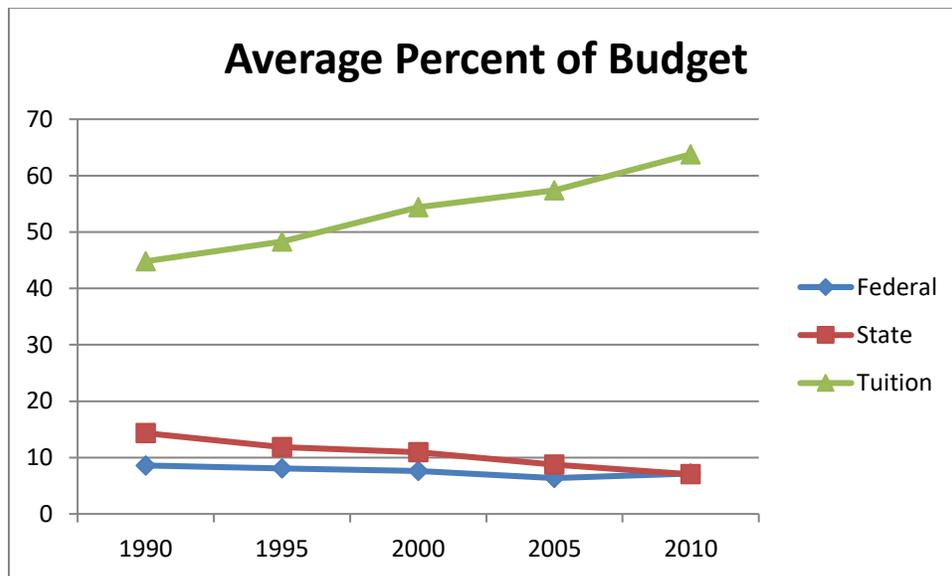


Note. Based upon author's calculations from IPEDS data.

In 1990, the year with the highest amount of revenue per student from the state, selective colleges received approximately \$4,504 (with a range between \$3,269 - \$5,739) per enrolled student. By 2011, the year with the lowest per student revenue, colleges were only receiving an average of \$2,783 per student (with a range between \$1,944 - \$3,621) from the state. In contrast, the average of federal per student spending steadily increased from 1990 (\$4,575) to 2006 (\$6,304) and averaged \$5,845 per student from 2007-2011. It appears that selective colleges began raising tuition (see Figure 10) as federal and state funding declined.

Figure 10

Percent of Annual Revenues Provided by Government and Undergraduate Tuition



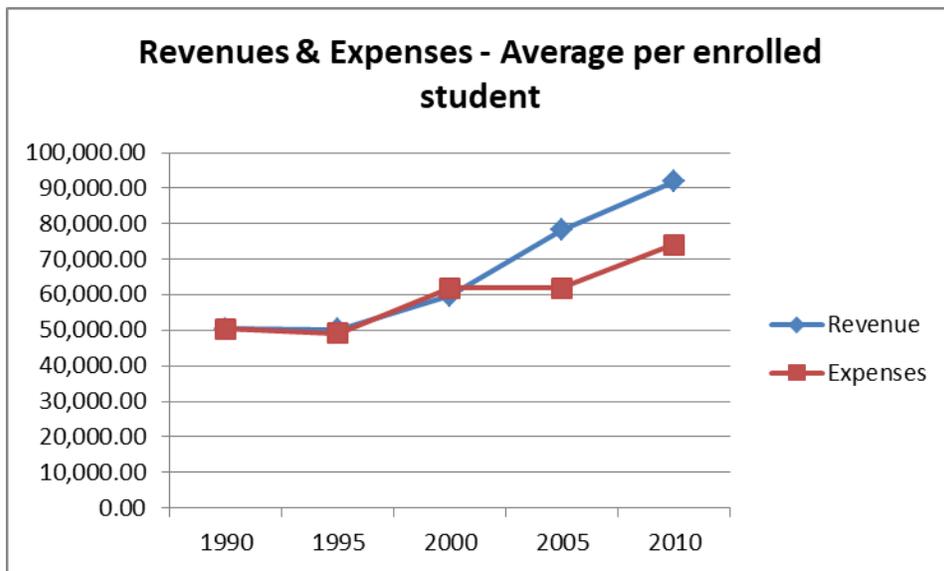
Note. Based upon author's calculations using IPEDS.

Beginning in 2000, selective colleges and universities began to receive more revenue than expenses (see Figure 11). Over the entire study, the average per student total revenue was \$67,131. In 1991, the year with the lowest per student total revenue, selective colleges averaged \$49,336 per student in revenue. The range of total per

student funding a selective college in 1991 was between \$37,682 and \$60,990. The average total revenue per student increased to a maximum of \$91,792 in 2008 with a range of funds between \$36,991 and \$146,595 per student. In 1993, the lowest year of per pupil expenditures, colleges spent an average of \$15,918 per student. In 1993, the range of per pupil expenses was as low as \$14,021 and as high as \$17,814. In 2008, the year with the highest per pupil expenditures, colleges spent an average of \$75,041 (with a range between \$21,621 and \$128,460) per student.

Figure 11

Average Total Revenues and Expenses Per Enrolled Undergraduate Student

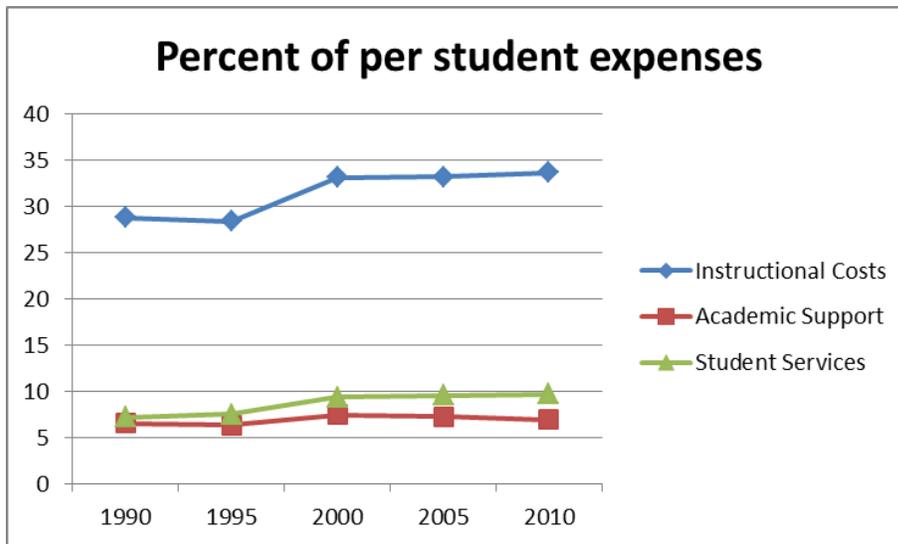


Note. Based upon author’s calculations using data published in IPEDS.

Most of the time, selective colleges spent more on instructional costs when compared to academic or student support services (see Figure 12). The percent of money dedicated to instructional expenses ranged from a low of 29% to a high of 67% with an average of 34% per year.

Figure 12

Percent of Total Expenses by Instructional Costs, Academic and Student Support Services



Note. Based upon author's calculations using data published in IPEDS.

In 1993, the year with the least amount of instructional expenses, colleges spent an average of \$11,408 per student (with a range between \$9,874 and \$12,941) on instruction. By 2008, the most expensive year, selective colleges were spending an average of \$17,819 (with a range between \$14,224 and \$19,427) per student on instruction. In contrast, the percent of expenses for academic support services ranged from a high of 15% to a low of 6% with the average close to 8% among all years under study. In 1993, the lowest cost year, selective colleges spent an average of \$2,648 per student (with a range of \$2,140 to \$3,211) on academic support services. By 2008, most expensive year, the average per student academic support services expenditures rose to \$6,060 (with a range between \$2,873 and \$8,908). Expenses for student support services modestly exceeded expenses for academic support services. Over the study period, selective colleges spent an average of 10% annually on student support services with a

low of 7% in 1990 and a high of 18% in 1993. In 1991, the lowest cost year, the average amount of expenses accrued for student support services averaged 7% per student. The following year (1992) selective colleges increased allocations for student supports to approximately 18% of total expenses. If added together, expenses for student and academic support services have increased annually to reach a similar funding level of instruction. In 1990, colleges spent approximately 14% of the budget on both student and academic support. By 2011, selective colleges were spending on average 32 % on both student and academic support services.

College Enrollment Regression

To estimate the effects of changes in federal law and policy on enrollment by racial groups, I regressed the natural log of total revenues per student, natural log of per student federal funding, natural log of per student state funding, average tuition rate per student, natural log of total expenses, natural log of instruction, natural log of academic and student support services expenses, college control, total number of affirmative action lawsuits, and the presence or absence of specific affirmative action lawsuits (*Fordice, Hopwood, Adams, Grutter, Gratz, Coalition, and Fisher*) against the percentage of Fall enrollment from each racial group. Table 7 provides the results of the regression analyses with percentage Fall enrollment by racial/ethnic group as the dependent variable. For example, in the first column, the dependent variable is the percentage of white students enrolled. The second column of results records the relationship between the independent variables and percentage of the Fall enrollment comprised of all non-white students. The remaining columns specify the relationship between the independent

variable and specific racial/ethnic groups, Black, Hispanic, Asian American/Pacific Islander/Pacific Islander, and Native American, respectively.

A 1% increase in total revenues per student was associated with an enrollment gain of 0.01%. Increasing federal revenue by 1%, with all else equal, is associated with a reduction in enrollment of white students by 0.001%. On the contrary, increasing federal revenues by 1% increases enrollment for Black, Hispanic, and Asian American/Pacific Islander students by 0.002%, 0.004%, and 0.001% in the following academic year. The value of federal funding on enrollment changes may be influenced by multicollinearity (see Appendix D). Changes in federal funding have a strong positive correlation with state funding, total expenses, instructional costs, and expenditures for academic and student support services (see Appendix D).

With all else equal, a 1% increase in state funding is associated with a statistically significant increase of 0.002% white students and 0.002% Black students in the following academic year. While a 1% increase for in-state tuition and fees was statistically significant, the associated increase or decrease of enrollment was less than zero. The effectiveness of tuition rates as a predictor variable may be reduced because there is a strong, negative correlation between public colleges and tuition rates and there is a strong, positive correlation between tuition rates and the indicator for private colleges (see Appendix D).

Table 7

Regression Coefficients and Standard Errors for Effects Of Federal Law and Policy

Changes on Enrollment by Race

Factors Influencing Enrollment by Race						
	White	Racially Marginalized	Black	Hispanic	Asian	Native American
Revenues	-0.62 -0.36	0.53* -0.25	0.32 -0.19	0.03 -0.13	0.12 -0.1	0.06 -0.04
Federal	-0.51** (0.15)	0.61** (0.10)	0.19* (0.08)	0.35** (0.05)	0.08* (0.04)	-0.01 (0.02)
State	0.19* (0.10)	0.20** (0.07)	0.20** (0.05)	0.00 (0.03)	-0.02 (0.03)	0.01 (0.01)
Expenses	-2.25** (0.62)	0.78 (0.43)	-0.06 (0.32)	0.19 (0.22)	0.82** (0.16)	-0.17* (0.08)
Instruction	-0.61 (0.47)	0.10 (0.32)	0.26 (0.24)	0.16 (0.17)	-0.31** 0.12	-0.01 (0.06)
Academic & Student Support	0.01 (0.25)	0.19 (0.17)	0.01 (0.13)	0.13 (0.09)	0.04 (0.07)	0.01 (0.03)
Tuition	-0.00** (0.00)	-0.00** (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00** 0.00	-0.00 (0.00)
Public College	0.96* (0.42)	-0.37 (0.30)	-0.35 (0.22)	0.04 (0.16)	-0.01 (0.11)	-0.05 (0.05)
Private College	0.17 (0.36)	-0.03 (0.26)	-0.09 (0.19)	0.02 (0.13)	0.06 (0.10)	-0.02 (0.05)
For-profit College	-8.81** (1.71)	-2.31* (1.11)	0.91 (0.83)	-2.30** (0.58)	-0.95* (0.42)	0.03 (0.20)
Number of desegregation cases	-0.87** (0.19)	0.09 (0.13)	0.10 (0.10)	0.06 (0.07)	-0.07 (0.05)	0.00 (0.02)
<i>Circuit Court decisions</i>						
Hopwood	1.27* (0.65)	-0.14 (0.46)	0.14 (0.34)	0.11 (0.24)	-0.57** (0.17)	0.18* (0.08)
Adams	0.37 (0.39)	-0.90** (0.28)	-0.03 (0.21)	-0.43** (0.15)	-0.35** (0.11)	-0.09 (0.05)
Coalition	-1.63** (0.41)	1.45** (0.29)	0.38 (0.22)	0.74** (0.15)	0.29** (0.11)	0.04 (0.05)
<i>Appellate Court decisions</i>						
Fordice	2.94** (0.74)	-2.60** (0.52)	-0.22 (0.39)	-0.84** (0.27)	-1.58** (0.20)	0.04 (0.09)
Hopwood	0.40 (0.66)	0.45 (0.46)	0.41 (0.35)	0.38 (0.24)	-0.54** (0.18)	0.20** (0.08)
Grutter	-3.37 (0.33)	0.53* (0.24)	0.35* (0.18)	0.10 (0.12)	-0.04 (0.09)	0.12** (0.04)
Coalition		2.32** (0.41)	0.68* (0.31)	1.46** (0.22)	0.17 (0.16)	0.02 (0.07)
Fisher	-0.02 (0.44)	0.58 (0.31)	-0.29 (0.23)	0.80** (0.16)	0.15 (0.12)	-0.09 (0.06)
<i>Supreme Court decisions</i>						
Fordice	0.28 (0.74)	-0.63* (0.24)	-0.12 (0.18)	-0.36** (0.13)	-0.13 (0.09)	-0.02 (0.04)
Grutter	-3.86** (0.33)	1.13** (0.24)	0.43* (0.18)	0.53** (0.12)	0.08 (0.09)	0.06 (0.04)

Source: Author's calculations from data published in the Integrated Post-Secondary Education Data Set.

* p < 0.05

** p < 0.01

Note: Standard errors appear in parentheses.

The relationship between college expenditures and fall enrollment differs from the relationship between revenues and enrollment (see Table 7). Total revenues were only statistically significant when predicting the enrollment rates of non-white students, whereas, total expenditures reach statistical significance when predicting the enrollment rates of white, Asian American/Pacific Islander and Native American students at selective colleges. Selective colleges and universities that increase total expenditures by 1% are more likely to experience a 0.02% reduction in white student and a 0.002% reduction in Native American enrollment the following Fall semester. Conversely, colleges are likely to experience a 0.008% enrollment increase, with all things equal, for Asian American/Pacific Islander students when a 1% increase in total expenditures happened the prior academic year. There is no statistically significant relationship between a 1% increase in academic and student support expenditures and the enrollment of white, Black, Hispanic, Asian American/Pacific Islander or Native American students. With all else equal, colleges are likely to experience a 0.003% enrollment decline for Asian American/Pacific Islander students when the cost of instruction per student increases by 1%.

The type of college (i.e. public, private, and for-profit) is associated with change in enrollment based upon race. Over the study period, public colleges gained an average of 0.96% of white students each academic year, while for-profit colleges were likely to experience a decline in enrollment for white (8.81%), Hispanic (2.30%), and Asian American/Pacific Islander (0.95%) students, with all things equal. This paragraph concludes the exploration of how differences in college specific factors effect enrollment

by race. For the next section of findings I will be moving into an examination of how changes in affirmative action case law affect college enrollment by race.

While circuit court decisions are only binding on a limited number of states, in my analysis I found a relationship between circuit court decisions in *Hopwood*, *Adams*, and the *Coalition to Defend Affirmative Action* (see the bottom panel of Table 7) in my national sample of selective colleges. Following the *Hopwood* circuit court decision, the percentage of Asian American/Pacific Islander students enrolled in selective colleges declined by 0.57% while the percentage of Native American and white students increased by 0.18% and 1.27% respectively. In the wake of the *Adams* decision, the shares of Hispanic and Asian American/Pacific Islander students declined by 0.43% and 0.35% respectively. Following the publication of the circuit court *Coalition* decision, the enrollment of white students decreased by 1.63% while the enrollment of non-white students (any Black, Hispanic, Asian American/Pacific Islander, or Native American student) increased by 1.45%. In summary, selective colleges experienced mixed enrollment changes following circuit court decisions. White students experienced an associated enrollment increase following *Hopwood* and *Coalition* decisions with all things equal. There was a decline in enrollment among students belonging to non-white student populations following the *Hopwood* and *Adams* decisions and an associated increase following the *Coalition* circuit court decision with all else held equal.

Even though the legal decision of an appellate court has regional influence, the publication of appellate court decisions was associated enrollment changes across the national sample of selective colleges. On average, the enrollment of white students increased in the fall semester (2.94%) after the publication of the *Fordice* appellate court

opinion. Non-white student enrollment is associated with a 2.32% enrollment increase following the release of the *Coalition* decision, with the largest associated increases in Hispanic (1.46%) and Black (0.68%) student enrollment. Selective colleges and universities had an associated enrollment gain of 0.35% of Black students and 0.12% of Native American students following the *Grutter* decision while the appellate court decision in *Hopwood* is associated with an increase in Native American (0.20%) enrollment and a decline of Asian American/Pacific Islander (0.54%) enrollment.

Appealing an affirmation action case has mixed results on the enrollment of white and non-white students. White enrollment grew following the *Fordice* decision, while the enrollment of non-white students declined post *Fordice* and increased post *Coalition*. Black students' enrollment increased following the publication of *Grutter* and *Coalition*, while Hispanic student enrollment fell after the *Fordice* decision and rose after *Coalition* and *Fisher*. Asian American/Pacific Islander student enrollment in selective colleges was reduced post *Fordice* and *Hopwood* while Native American enrollment experienced increases after *Hopwood* and *Grutter*.

My analysis suggests that after two affirmative action cases were decided by the Supreme Court, there were declines in enrollment for both non-white and white students with the exception of *Grutter*. The share of white students enrolled in selective colleges declined by 3.86% following the *Grutter* decision. The percentage of non-white students enrolled declined by 0.63% after the *Fordice* ruling. Following *Grutter*, the shares of enrollment comprised of non-white students increased by 1.13% with an associated gain of 0.43% of Black students and 0.53% of Hispanic students.

Degree Completion Regression

While affirmative action directly regulates college admissions, legal decisions or constitutional amendments banning race from consideration that receive media attention may have a symbolic relationship for students of color because of inferences that can be drawn regarding belonging and acceptance (Steele, 1998). A currently enrolled student of color may wonder if a college values who they are as a person if legal doctrine limits the ability of a similarly situated student to enroll at the same college (Rendon, 1994). Court cases and affirmative action bans publicized by the media become “window dressings” by which a current student may infer a climate of exclusion, unimportance, or hostility (Dill & Zambrana, 2009). Legal decisions affect outcomes beyond the legal jurisdiction so one is left to wonder how changes in federal law and policy effect both incoming students and current students.

To estimate the effects of changes in federal law and policy on completion rates by racial groups, I regressed the natural log of total revenues per student, natural log of per student federal funding, natural log of per student state funding, average tuition rate per student, natural log of total expenses, natural log of instruction, natural log academic and student support services expenses, college control, total number of affirmative action lawsuits, and the presence or absence of specific affirmative action lawsuits (*Fordice, Hopwood, Adams, Grutter, Gratz, Coalition, and Fisher*) against the percent of degrees awarded to each racial group. The finance variables (total revenues, federal funding, state funding, total expenses, instruction and academic/student support) were lagged by a year. Most colleges end their fiscal years in October so it made more sense to understand how money spent the years prior to the measure of degree completion was associated

with this outcome rather than including how money was spent following graduation. Table 8 provides the results of the regression analyses with percent of degrees awarded by racial/ethnic group as the dependent variable. For example, in the first column, the dependent variable is the degree completion of white students. The second column of results records the relationship between the independent variables and the percent of degrees awarded to students belonging to a non-white student group. The remaining columns specify the relationship between the independent variables and percentage of degrees awarded to Black, Hispanic, Asian American/Pacific Islander, and Native American students, respectively.

Table 8

Regression Coefficients and Standard Errors for Dependent Variables Associated with the Percentage of Degrees Awarded To White, Black, Hispanic, Asian American/Pacific Islander, and Native American Students by Selective American Colleges, 1990-2012

Factors Influencing Degree Completion by Race						
	White	Racially Marginalized	Black	Hispanic	Asian	Native American
Total Revenues	-35.74 -44.23	0.91** -0.37	0.11 -0.31	0.48** -0.17	0.38** -0.13	-0.05 -0.05
Federal funding	3.15 (18.45)	0.66** (0.15)	0.28* (0.13)	0.26** (0.07)	0.10 (0.05)	0.01 (0.02)
State Funding	-1.04 (12.17)	0.08 (0.10)	0.04 (0.08)	0.01 (0.05)	0.04 (0.04)	-0.01 (0.01)
Tuition	0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	-0.00* (0.00)	0.00 (0.00)
Total Expenses	-7.05 (49.46)	0.46 (0.41)	0.34 (0.34)	-0.09 (0.19)	0.21 (0.14)	-0.00 (0.05)
Instruction	-6.72 (56.79)	-0.96* (0.47)	-0.22 (0.39)	-0.40 (0.22)	-0.38* (0.17)	0.03 (0.06)
Academic & Student Support	14.98 (39.70)	0.41 (0.33)	0.03 (0.27)	0.11 (0.15)	0.30** (0.12)	-0.04 (0.04)
Number of desegregation cases	-3.10 (23.14)	0.44* (0.19)	0.22 (0.16)	0.22** (0.09)	-0.02 (0.07)	0.03 (0.02)
Public College	9.89 (70.01)	-0.89 (0.58)	-0.56 (0.49)	-0.23 (0.27)	-0.01 (0.21)	-0.10 (0.07)
Private College	-0.22 (54.69)	-0.66 (0.46)	-0.24 (0.38)	-0.54** (0.21)	0.01 (0.16)	0.11 (0.06)
For-profit College	140.82 (232.56)	-1.77 (1.89)	-1.15 (1.57)	2.52** (0.88)	-3.53** (0.66)	0.40 (0.24)
<i>Circuit Court decisions</i>						
Hopwood	-6.444 (40.87)	1.44** (0.34)	0.53 (0.28)	0.42** (0.16)	0.47** (0.12)	0.03 (0.04)
Adams	3.78 (49.14)	2.53** (0.41)	2.75** (0.34)	-0.21 (0.19)	-0.25 (0.15)	0.06 (0.05)
Coalition	662.79** (49.94)	0.78 (0.42)	-0.05 (0.35)	0.58** (0.20)	0.27 (0.15)	-0.02 (0.05)
<i>Appellate Court decisions</i>						
Fordice	-1.38 (67.20)	-3.20** (0.56)	-1.03* (0.47)	-1.12** (0.26)	-1.02** (0.20)	-0.03 (0.07)
Hopwood	-6.65 (51.16)	2.39** (0.43)	0.94** (0.36)	0.64** (0.20)	0.74** (0.15)	0.08 (0.05)
Grutter	-2.95 (38.63)	0.70* (0.32)	0.47 (0.27)	0.25 (0.15)	-0.03 (0.12)	0.01 (0.04)
Coalition	575.55** (81.54)	1.44* (0.68)	-0.22 (0.57)	1.56** (0.32)	0.15 (0.24)	-0.03 (0.09)
Fisher	-754.83** (54.92)	0.50 (0.46)	-0.19 (0.38)	0.52* (0.21)	0.24 (0.16)	-0.07 (0.06)
<i>Supreme Court decisions</i>						
Fordice	7.12 (42.36)	-1.00** (0.35)	-0.02 (0.29)	-0.77** (0.17)	-0.21 (0.12)	-0.00 (0.04)
Grutter	-5.71 (39.84)	1.12** (0.33)	0.73** (0.28)	0.40** (0.16)	-0.03 (0.12)	0.02 (0.04)

Source: Author's calculations from data published in the Integrated Post-Secondary Education Data Set.
 * p < 0.05
 ** p < 0.01
 Note: Standard errors appear in parentheses.

The association between variables related to college finance and degree completion differs from the findings on college enrollment. The source of funding, type of funding, and per pupil revenue and expense is not associated with the degree completion of white students at selective colleges with all things held equal, whereas non-white students are sensitive to the total amount of revenues, amount of funding sent by federal sources, the cost of instruction and the cost of academic & student support services. The percent of degrees awarded to non-white students is associated with a marginal gain of 0.009% in completion with a 1% increase in total revenues. The two primary groups who benefit from the increase in revenues are Hispanic and Asian American/Pacific Islander students because their degree completion rates increase by 0.005% and 0.004% respectively. When the 1% increase in revenues comes from federal funds specifically, the percent of degrees awarded to non-white students is associated with an increase of 0.007% with all things equal. My findings suggest that Black and Hispanic students are the only racial groups sensitive to a 1% increase in federal funding. When expenses increase by 1% for instructional costs, the percent of degrees awarded to Asian American/Pacific Islander students may be likely to decline by 0.004% the following May.

The type of college selected by Asian American/Pacific Islander and Hispanic students are associated with degree completion rates. During the years under study, the percent of degrees awarded to Hispanic students is associated with a 2.52% increase at for-profit colleges and a 0.54% decline at non-profit colleges. Attending a for-profit college for Asian American/Pacific Islander students is associated with a 3.53% decline in percentage of awarded degrees.

Multicollinearity may be affecting the statistical significance of the analysis presented in the proceeding paragraphs (see Appendix D). A strong positive correlation exists between federal funding, total expenses, instructional costs, and academic and student support service expenditures. A moderately positive correlation exists between state funding levels and total expenditures, instructional costs, and academic and student support service expenditures. Tuition rates have a strong positive correlation with private university status and a strong negative correlation with public university status.

With the analysis on college specific variables complete, I want to move into examining the effects of affirmative action case law on completion rates by race. The legal environment as measured by the presence of an affirmative action case is associated with the percent of degrees awarded to white, Black, Hispanic, Asian American/Pacific Islander students. As the number of affirmative action legal decisions increases, so does the percentage of degrees awarded to non-white students (0.44%) and more specifically Hispanic students (0.22%). The effect of each legal case varies based upon the level of decision (circuit, appellate and Supreme Court) and the specific case at hand.

The degree completion rate for non-white students increased by 1.44% and 2.53%, respectively, following the *Hopwood* and *Adams* circuit court decisions. The percent of degrees awarded to Hispanic and Asian American/Pacific Islander students by 0.42% and 0.47%, respectively, increased at selective colleges following the *Hopwood* circuit court decision. The percent of degrees awarded to Black students is associated with a 2.75% increase following the *Adams* decision. The percent of degrees awarded to white students increased by 663% following the publication of the *Coalition* circuit court decision. In summary, the share of degrees awarded to non-white students increased

following the court decisions in the 1990s. White students saw percent gains in degree completion because of circuit court decisions.

The associated effect of appellate court decisions on degree completion is mixed. White students were unaffected by appellate court decisions until the early 2010s. Then they experienced two significant swings in the percentage of degrees awarded following the publication of the *Coalition* (576% increase) and *Fisher* (755% decline) decisions. The effect of *Fordice*, *Hopwood*, *Grutter* and *Coalition* depends on the specific racial group a student belongs to for non-white students. Overall, the share of degrees awarded to non-white students declined following the *Fordice* (3.20%) case and increased following *Hopwood* (2.39%), *Grutter* (0.70%) and *Coalition* (1.44%) when all else is equal. Black and Asian American/Pacific Islander students were more likely to experience a reduction in degree completion following *Fordice* (1.03% and 1.02% respectively) and an increase following *Hopwood* (0.94% and 0.64% respectively). In contrast, there was a decline in the completion rate of Hispanic students associated following the *Fordice* (1.12%) appellate court opinion and increases following *Hopwood* (0.64%), *Coalition* (1.56%), and *Fisher* (0.52%) and appellate court decision with all else equal. In conclusion the effect of appellate court rulings on degree completion rates varies by case and racial/ethnic group.

When we evaluate Supreme Court decisions, these rulings are only associated with changes in the percentages of degrees awarded to non-white student groups. Following the *Fordice* decision in the 1990s, there was a 1% decrease in the completion rates of non-white students at selective colleges. By the release of the 2003 *Grutter* decision, the effect of legal rulings on percent of degrees awarded to non-white students

had turned positive. Following the *Fordice* decision, the degree completion rates associated with Hispanic students declined by 0.77%, with all things equal. The trend reversed following *Grutter*, Black and Hispanic students were more likely to see a percent increase of 0.73% and 0.40% respectively.

CHAPTER 5

Discussion and Conclusion

I conclude my dissertation by presenting the major findings, discussing the policy implications, proposing a direction for future research, and reviewing limitations. In I found that there was a statistically significant relationship between enrollment and completion rates, college finances (i.e. revenue and expenditures) and the filing of federal desegregation cases. Furthermore, the factors that promote enrollment and completion vary by racial/ethnic group. In some cases overall student body diversity may increase while some non-white student groups experience declines in enrollment or completion rates.

Understanding College Finance

Federal and state allocations, grants, and contracts are two revenue streams for selective colleges and universities. Through the aforementioned analysis, federal revenues were marginally associated with the enrollment and completion rates of non-white students in selective colleges. Increasing federal spending per student by 1% at selective colleges and universities suggests that non-white students' undergraduate enrollment in selective colleges will increase by approximately 0.006% and increase in completions by 0.007%. For example, increasing federal funds to support instructional costs is associated with an enrollment decline and degree completion reduction for Asian American/Pacific Islander students.

In contrast, the magnitude of change associated with funding changes in state revenues only effected enrollment for non-white students. My dissertation suggests that

white students benefit when selective colleges receive a 1% increase in state funding because statistically significant enrollment gains of 0.002% were observed. The allocation of revenues into instructional cost and academic or student support services influences the effectiveness of revenue increases. To maximize the effectiveness of public funding, it would be prudent for policy makers to direct funding increases to organizational expenditures that increase the enrollment and degree completion rates of a diverse student body.⁹

College Cost Increases

Contrary to Berger & Kostal (2002), I found a statistically significant, yet socially irrelevant (0%), relationship between one dollar tuition and fees increase, in 2012 inflation adjusted dollars, and the enrollment rates of white and the enrollment and degree completion rates of Asian American/Pacific Islander students. Tuition increases were not associated with changes in enrollment or degree completion for white, Black, Hispanic, Asian American/Pacific Islander, Native American students during the years under study. This finding should be interpreted with caution because multicollinearity exists between tuition rates and public/private status of a university (see Appendix D). The correlation between tuition rates and public university status was approximately -0.72. The correlation between tuition rates and private university status hovers close to 0.71.

⁹ Raising total expenses reduces the enrollment of white students. In some ways the initial Pell Grant program created in 1972, inadvertently addressed the findings from my dissertation because it only covered a portion of college costs. I am not here to say whether the percent of covered expenses was conducive to enrolling a diverse student body. My dissertation finds a relationship between college revenues and expenditures and student enrollment and degree completion.

Federal Desegregation Cases

The publication of circuit, appellate and Supreme Court affirmative action decisions has mixed effects on college enrollment and completion rates by race. Following the *Hopwood* circuit court decision, I observed an associated 1.27% increase in White student enrollment, a 0.57% decrease in Asian American/Pacific Islander student enrollment and 0.18% increase in Native American enrollment at selective colleges. The degree completion rates for any non-white student, and more specifically Hispanic and Asian American/Pacific Islander students increased by 1.44%, 0.42% and 0.47% respectively after the publication of the *Hopwood* circuit decision. In short, a white student asserted reverse discrimination in *Hopwood* in its wake, selective colleges experienced an associated increase in white student enrollment and degree completion rates for any non-white student, Hispanics and Asian American/Pacific Islanders. When non-white plaintiffs sought to dismantle a state-wide ban on the prohibition of using race in admission decisions, my results suggest a different trend at the circuit court level. The circuit court decision in *Coalition* is associated with a 1.63% enrollment decline for white students and enrollment increases of 1.45% for non-white students, more specifically 0.74% of Hispanic and 0.29% of Asian American/Pacific Islanders students. The degree completion rates soared for white students (663% increase) following the *Coalition* circuit decision while a small 0.58% increase in degree completion rates for Hispanic students was observed. In short, the filing of a lawsuit against an state-level ban on affirmative action in Michigan is associated with an enrollment decline for white students, degree completion increase for white students, enrollment increase for Hispanic

and Asian American/Pacific Islander students, and a degree completion increase for Hispanic students.

The relationship between enrollment and degree completion following the *Adams* circuit decision tells a different story. In *Adams* multiple states were not complying with federal desegregation mandates, following the publication of the circuit court decision, respective enrollment declines of 0.90%, 0.43%, and 0.35% were observed for any non-white student and more specifically Hispanic and Asian American/Pacific Islander students. Yet, the publication of the *Adams* decision improved degree completion rates for any non-white student and more specifically Black students by 2.53% and 2.75% respectively. In an effort to legally require desegregation in many southern states, selective colleges observed a corresponding enrollment decline of non-white students and a relative increase in degree completion rates for non-white students following a circuit court decision.

The effects of appealing circuit court decisions to an appellate court could follow a similar pattern as circuit court decisions. For example, non-white students sought legal relief from discriminatory testing practices in *Fordice*. Following this appellate court decision, nonwhite student enrollment experienced an associated decline of 2.60% for any non-white student and more specifically a decline of 0.84% of Hispanic students and 1.58% of Asian American/Pacific Islander students. The effect of the *Fordice* appellate ruling on racial diversity didn't stop with reduction in enrollment, selective colleges were likely to also see a 3.02% reduction in degree completion for any non-white student and corresponding 1% reductions in degree completion rates for Black, Hispanic, and Asian American/Pacific Islander student groups respectively. When non-white plaintiff's

sought the reversal of an affirmative ban in Michigan through the *Coalition* appeal, the effects were marginally better for non-white students. Following the *Coalition* appeal selective colleges were more likely to see a relative increase of enrollment by 2.32% for any non-white student, while more specifically enrollment for Black and Hispanic students increased by 0.68% and 1.46% respectively.

The value of appellate court decisions for white students tells a different story from non-white students. The only appellate court decision with a statistically significant relationship to enrollment is *Fordice*. Selective colleges were likely to see a 3% increase in white student enrollment following the *Fordice* decision, a lawsuit filed by non-white plaintiffs. When non-white plaintiffs sought to allow colleges to use race in admissions decisions in the *Coalition* case, the degree completion rates for White students at selective colleges soared by 576% after the appellate court ruling. This trend quickly came to an end when the appellate court issued a ruling in a lawsuit filed by a white student against a university in Texas in *Fisher*. Following the *Fisher* appellate ruling, white degree completion rates plummeted by 755%. On a different note, the degree completion rates for non-white students increased following *Hopwood*, *Grutter*, and *Fisher* appellate court decisions. Non-white students were most likely to experience gains in degree completion following *Hopwood*. Selective colleges were likely to see gains of 2.39% for any non-white student and more specifically for Black, Hispanic and Asian American/Pacific Islander students by 0.94%, 0.64%, and 0.74% respectively post *Hopwood*.

Appealing a court decision to the Supreme Court tends to have a greater impact on non-white student enrollment and degree completion. White students at selective

colleges were likely to experience a 4% enrollment decline after the *Grutter* decision in 2003. Non-white students were likely to experience an enrollment and completion rate decline after *Fordice* before witnessing an enrollment and completion rate increase after *Grutter*. In this case, the *Grutter* Supreme Court decision is associated with a lasting legacy of increasing racial diversity at selective colleges. A white student sued to prohibit the use of race at Michigan colleges, which led to a national decline in white enrollment and a national increase in non-white student enrollment degree completion. The degree completion and enrollment rate for any non-white student increased by just over 1% following *Grutter*. More specifically, after *Grutter* there was an increase of Black and Hispanic degree completions at selective colleges by 0.73% and 0.40% respectively. Enrollment rates of Black and Hispanic students increased by 0.43% and 0.53% respectively.

My dissertation suggests that someone could modestly conclude that as the number of lawsuits increase, selective colleges may see a reduction of white student enrollment. Similarly, as the number of lawsuits increase, my findings could reasonably lead to the conclusion that degree completion rates for non-white student groups modestly increase. No statistically significant relationship exists between the number of affirmative action cases and white student completion or enrollment. The data analysis suggests that the completion rates for non-white students was associated with an incremental increase of 0.44% as the number of affirmative cases increased.

In short, the legacy of a legal ruling varies based upon the case and point in time. When white students challenge the use of affirmative action, we noticed a decline in enrollment for non-white students post *Hopwood*. In the majority of cases when white

students challenge the use of race in admission decisions, there was an associated increase in enrollment (i.e. *Grutter & Fisher*) and completion (i.e. *Grutter, Hopwood, & Coalition*) for non-white students. On the contrary when non-white students sought to overturn practices not conducive to racial diversity in American colleges, there were enrollment declines post *Adams* and *Fordice*, enrollment gains post *Coalition*, degree completion gains post *Adams* and *Coalition*, and degree completion losses post *Fordice*.

Policy Implications

The potential insights of my findings for public policy decisions depends upon the motives of the policy maker. I undertook this research with the assumption that the findings would contribute to the development of new policies that would increase racial diversity in selective colleges because of the multitude of benefits found from inter-group contact on educational outcomes. As the project progressed I realized my dissertation may also give policymaker the tools they need to reduce enrollment and degree completion for generationally excluded racial groups. Finishing my dissertation became hard because I did not want my research to provide ammunition for opponents of affirmative action and thus potentially hurt the groups I wanted to protect. It was not until someone told me that my results could validate what non-white students and families had known for years that I became motivated to finish the work. With that said, I do have some considerations for policy makers as we move forward.

First, my dissertation suggests that federal investment in educational opportunities increases the enrollment and degree completion for non-white students. This finding is consistent over time. We cannot begin to achieve equitable outcomes without a commitment to increasing federal funds available to support student expenses at selective

colleges. Federal funds are particularly important for selective colleges because many are private non-profit entities with limited access to state funding. Furthermore, increasing federal funding through the Pell Grant program has more promise for non-white students than increasing the availability of federally-financed student loans. Many non-white students may be reticent to borrow money for a high cost college due to low degree completion rates for similarly situated students.

Similarly, white students may decry the increase in federal funding out of fear that seats in high quality educational institutions may be reduced for academically qualified white students. The findings of my dissertation suggest the enrollment of white students may be expanded with increases in state-based aid to selective colleges. Often times we think of enrollment and completion as zero sum games where one group benefits at the expense of others. My dissertation suggests we can ensure accessibility for all students regardless of racial demographics when we fund colleges using a broad set of mechanisms that protect enrollment and degree completion for all races.

College finance is only one factor in degree completion and group enrollment. While we cannot prevent an aggrieved student from filing a federal affirmative action lawsuit, we can make a commitment to study the effects of said lawsuit following a legal decision. For example, if we find that enrollment is decreasing following a legal decision we may seek to expand financial resources to counteract the declines in enrollment or degree completion. As the total number of affirmative action lawsuits increase, selective colleges may see a corresponding reduction in white student enrollment. My dissertation suggests the filing of a 'reverse discrimination' affirmative action lawsuit may have counterintuitive effects on the group it aims to protect. It would be easy to say based

upon my findings that sometimes to assert an individual right does not always protect the group goal. It is too difficult to predict if a legal case will produce the outcomes associated with cases like *Coalition* (protecting white students) or *Grutter* (benefitting non-white students). My analysis highlights how the effects of affirmative action lawsuits may last well beyond the educational careers of the litigants in the courtroom.

Future Research

My dissertation focused on the enrollment and completion rates of non-white students at selective institutions. The model I used to assess the relative effects of organizational behavior and federal law and policy changes could be applied to other types of colleges in the US higher education industry. My study included approximately 25% of colleges and universities in America. Different relationships between the independent and dependent variables may be evident when we expand the volume of colleges under study.

A couple of modifications to the regression analysis could be made to mitigate the effects of multicollinearity. First, including several smaller analyses using college type (i.e. public, private, and for-profit) as a filter would reduce the multicollinearity between tuition status and college control. Second, the gradual introduction of variables on revenues and expenditures would reduce the multicollinearity between federal funding, state funding, instructional costs, academic support expenses, and student support services funding. With these changes, the magnitude of the effects I document here may change on some of the independent variables.

Once a thorough understanding emerges about the factors influencing the enrollment and completion of non-white students, the research community could begin an

endeavor to categorize colleges on an equity scale. My dissertation provides some evidence that equitable colleges should use public resources to enroll and graduate a diverse student body. The possibility of a ranking system becomes feasible when we can understand the average university's reaction to changes in revenue, expenses, college costs, and desegregation lawsuits.

Limitations

There are five limitations to this analysis. First, every college in the sample did not have data for all years under study. Based upon test scores and admission rates, I defined colleges and universities were defined as selective. The number of participating colleges varied from year to year. Inclusion of all colleges for all years would increase the precision of the fixed effects regression. However, the missing data was random, that is, systematic exclusion of a specific type of selective college or university did not occur. Because the missing data was random the reliability of the findings remains intact.

Some of the desired dependent variables (i.e. federal financial aid metrics) were missing data for more years than feasible for study inclusion. For this reason, I am not able to draw direct conclusions on the costs or benefits of investing in Pell Grants as opposed to loans or federal work study could not be explored. To maximize the years under study to estimate the long range effects of affirmative action lawsuits, I chose to forgo an analysis on the effects of federal financial aid on enrollment and completion rates.

Additionally, I attempted to utilize HEGIS data for my dissertation. The data quality impeded my ability to expand the number of years considered in the analysis. This also means I was not able to estimate the effects of the *Bakke* decision on college

enrollment and degree completion. Expanding the number of years may change the direction and magnitude of some of my findings on the effects of affirmative action case law.

Finally, the coefficients for revenues, expenses, and tuition are affected by multicollinearity. A perfect correlation exists between none of the independent variables. My dissertation suggests a strong relationship exists between funding sources and expenditures on instructional costs, academic support services, and student support services. While some may say this detracts from my ability to predict the variables influence enrollment and completion, I find this particular finding highly insightful into how money flows into and through a college to reach students.

Conclusion

Colleges have traditionally been evaluated based upon who was excluded, not who was included. More prestige was conferred upon colleges with high rejection rates and premier tests scores. The implementation of affirmative action incentivized colleges to diversify enrollment. At the same time colleges were being sued in court by White students rejected for admissions and non-white students who experienced discrimination. Through the federal lawsuits, we learned that enrolling a diverse student body is an important public outcome for American colleges and universities.

My dissertation suggests that the enrollment of non-white students is associated with levels of federal and state funding, the availability and value of Pell Grant assistance, the cost of attendance and tuition, and the number of desegregation cases heard by federal courts. While the choices students exercise during the application and enrollment process for higher education are also important, my dissertation offers insight

into organizational behavior and policy influences that are associated with the recruitment of a diverse student body.

My analysis provides insights into the factors associated with the enrollment of a diverse student body by explaining how changes in federal spending, state spending, college spending, tuition and cost of attendance and Pell grant availability and value may increase the number of non-white students enrolled in selective American colleges. The findings from my analysis could be relevant for administrators at selective colleges and policymakers as they make budgetary and policy decisions that could increase the enrollment of Black, Hispanic, Asian American/Pacific Islander and Native American students in selective colleges.

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APPENDIX A

SAMPLE COLLEGES

College Name	Admission Rate	SAT Reading	SAT Math
Abilene Christian University	45.50		
Agnes Scott College	45.20		
AI Miami International University of Art and Design	39.72		
Alabama A & M University	39.89		
Alabama State University	42.30		
Alaska Pacific University	33.03		
Albany State University	30.64		
Albion College			610.00
Alcorn State University	33.84		
Alderson Broaddus University	40.63		
Alice Lloyd College	25.65		
Allen College	30.81		
Alliant International University-San Diego	39.48		
Alma College	19.47		
American Conservatory Theater	4.76		
American Indian College Inc	44.44		
American InterContinental University	35.72		
American InterContinental University	27.90		
American InterContinental University-Atlanta	43.90		
American InterContinental University-Houston	38.71		
American InterContinental University-South Florida	36.90		
American Musical and Dramatic Academy	34.59		
American University	43.10	592.86	
Amherst College	17.11	665.00	663.00
Andrews University	40.35		
Appalachian Bible College	25.77		
Aquinas College	39.47		
Argosy University-The Art Institute of California-Hollywood	37.28		
Argosy University-The Art Institute of California-Inland Empire	43.42		
Argosy University-The Art Institute of California-Los Angeles	36.66		
Argosy University-The Art Institute of California-Orange County	40.96		
Argosy University-The Art Institute of California-Sacramento	43.65		
Argosy University-The Art Institute of California-San Diego	33.93		

Argosy University-The Art Institute of California-San Francisco	38.07		
Argosy University-The Art Institute of California-Silicon Valley	39.33		
Arizona Christian University	39.84		
Arkansas Tech University	44.43		
Art Academy of Cincinnati	31.39		
Atlanta College of Art	34.34		
Atlantic Union College	39.41		
Austin Peay State University	45.05		
Ave Maria University	36.18		
Averett University	22.82		
Avila University	43.05		
Babson College	36.11		616.25
Bacone College	37.90		
Bais Medrash Toras Chesed	43.94		
Baptist Memorial College of Health Sciences	32.24		
Barclay College	36.79		
Bard College	34.72		
Bard College at Simon's Rock	43.59	610.00	
Barnard College	28.55	636.67	623.17
Barnes-Jewish College Goldfarb School of Nursing	45.57		
Barton College	44.41		
Bates College	29.41	630.00	645.00
Baylor University	42.06		
Beacon College	36.23		
Belhaven University	44.56		
Bellin College	36.50		
Beloit College		600.00	
Bemidji State University	42.20		
Benedictine College	26.76		
Bennett College	45.56		
Bennington College		605.00	
Bentley University	41.26		610.00
Berea College	24.56		
Berklee College of Music	38.99		
Bethany College	43.01		
Bethany University	45.25		
Bethesda University	41.82		
Bethune-Cookman University	27.86		

Biola University	39.40		
Blessing Rieman College of Nursing	39.74		
Bloomfield College	37.64		
Blue Mountain College	43.75		
Bluefield College	40.60		
Bluefield State College	41.13		
Bon Secours Memorial College of Nursing	10.00		
Boricua College	39.04		
Boston Baptist College	44.74		
Boston College	30.00	609.17	634.17
Boston University	45.61	597.50	611.67
Bowdoin College	21.00	652.73	653.64
Bowie State University	42.61		
Brandeis University	38.87	623.36	633.64
Brenau University	35.63		
Brescia University	16.23		
Brevard College	29.04		
Brewton-Parker College	37.07		
Briar Cliff University	21.20		
Briarcliffe College	45.75		
Brigham Young University-Hawaii	22.43		
Brooks Institute	18.08		
Brown University	13.42	650.83	662.50
Bryant & Stratton College-Parma	40.00		
Bryant University	44.25		
Bryn Athyn College of the New Church	44.26		
Bryn Mawr College	43.64	613.33	
Bucknell University	32.92	595.83	626.67
Cabarrus College of Health Sciences	44.14		
California Institute of Technology	16.62	699.00	765.00
California Institute of the Arts	30.76		
California Lutheran University	43.99		
California Polytechnic State University-San Luis Obispo	27.17		
California State Polytechnic University-Pomona	31.61		
California State University-Channel Islands	34.60		
California State University-Dominguez Hills	13.67		
California State University-East Bay	33.88		
California State University-Fullerton	45.47		

California State University-Long Beach	35.59		
California State University-Los Angeles	44.86		
California State University-Monterey Bay	44.40		
California State University-San Bernardino	22.16		
California State University-San Marcos	39.78		
California State University-Stanislaus	35.08		
Calumet College of Saint Joseph	35.45		
Calvary Bible College and Theological Seminary			610.00
Campbell University	32.93		
Capitol Technology University	38.30		
Cardinal Stritch University	40.63		
Careers Unlimited	21.98		
Carleton College	30.55	655.00	654.17
Carnegie Mellon University	33.88	612.50	678.33
Case Western Reserve University		595.00	636.67
Catawba College	43.24		
Cedar Crest College	41.82		
Center for Advanced Legal Studies	37.50		
Central Baptist College	45.00		
Central Baptist Theological Seminary	16.67		
Central Bible College	42.44		
Central Christian College of Kansas	45.21		
Central Christian College of the Bible	29.77		
Central Penn College	36.39		
Central State University	34.98		
Centre College		595.00	
Chamberlain College of Nursing - St Louis Campus	24.32		
Chamberlain College of Nursing-Florida	22.50		
Chamberlain College of Nursing-Georgia	33.33		
Chamberlain College of Nursing-Illinois	30.38		
Chamberlain College of Nursing-Indiana	33.33		
Chamberlain College of Nursing-Missouri	20.69		
Chamberlain College of Nursing-Texas	12.82		
Chancellor University	36.37		
Chapman University	44.22		
Charles R Drew University of Medicine and Science	35.02		
Chester College of New England	39.53		
Chicago State University	40.02		

Chowan University	26.51		
Christian Brothers University	43.26		
Claflin University	35.78		
Claremont McKenna College	20.73	637.50	650.83
Clarkson College	36.07		
Clayton State University	40.39		
Clearwater Christian College	39.39		
Cleveland Institute of Art	29.98		
Cleveland Institute of Music	35.50		
Coker College	26.27		
Colby College	33.13	629.17	635.83
Colgate University	28.86	624.17	639.17
College for Creative Studies	38.23		
College of Saint Mary	43.80		
College of the Holy Cross	37.47	630.00	
College of the Ozarks	11.31		
College of William and Mary	33.72	626.67	621.67
Collins College	25.64		
Colorado Christian University	28.06		
Colorado College	31.80	615.00	615.00
Colorado School of Mines	40.99		627.14
Colorado Technical University-Kansas City	39.68		
Colorado Technical University-Online	40.32		
Columbia College	26.51		
Columbia University in the City of New York	10.85	671.82	681.82
Concordia University-Ann Arbor	33.01		
Concordia University-Chicago	28.39		
Concordia University-Irvine	29.07		
Concordia University-Portland	24.68		
Concordia University-Saint Paul			620.00
Connecticut College	35.63	622.67	613.40
Converse College	44.61		
Cooper Health System Center for Allied Health Education	37.23		
Cooper Union for the Advancement of Science and Art	10.36	610.00	635.71
Coppin State University	36.72		
Corban University	39.45		
Corcoran College of Art and Design	29.20		
Cornell College	44.21		

Cornell University	23.35	629.17	670.00
CORNELL UNIVERSITY-NY STATE STATUTORY COLLEGES	30.85	620.00	640.00
Cornish College of the Arts	40.70		
Cox College	18.97		
Crossroads College	36.68		
Crown College	37.30		
Culinary Institute of America	35.86		
Cumberland University	41.46		
CUNY Bernard M Baruch College	29.27		
CUNY Brooklyn College	35.91		
CUNY City College	36.54		
CUNY Hunter College	30.67		
CUNY John Jay College of Criminal Justice	38.62		
CUNY Lehman College	29.66		
CUNY Queens College	38.69		
CUNY York College	37.98		
Curtis Institute of Music	6.58		
Dakota Wesleyan University	21.44		
Dallas Baptist University	43.44		
Dallas Christian College	31.32		
Dalton State College	43.43		
Dana College	18.20		
Dartmouth College	14.78	665.45	678.18
Davidson College	28.75	627.50	634.58
Davis College	40.22		
Dean College	38.68		
Delaware State University	39.29		
Delta State University	27.79		
Denison University	39.74	600.00	
Denver School of Nursing	34.62		
Design Institute of San Diego	40.00		
DeVry University-Indiana	38.24		
DeVry University-Wisconsin	45.45		
Dickinson College	42.17	598.00	
DigiPen Institute of Technology	35.99		
Dillard University	31.49		
Divine Word College	37.78		
Drury University	42.02		

Duke University	20.34	661.82	680.91
Dunwoody College of Technology	31.61		
East Stroudsburg University of Pennsylvania	20.52		
Eastern Illinois University	38.75		
Eastern Oregon University	43.36		
Ecclesia College	37.36		
Edinboro University of Pennsylvania	39.77		
Edward Waters College	25.18		
Elon University	42.39		
Emerson College	42.38	590.00	
Emmanuel College	36.39		
Emory University	33.27	634.17	660.00
Endicott College	44.26		
Eureka College	32.65		
Everest College-Phoenix	44.65		
Everest College-Springfield	36.77		
Everest University-Brandon	31.83		
Everest University-Jacksonville	41.30		
Everest University-Melbourne	42.31		
Everest University-North Orlando	42.46		
Farmingdale State College	40.54		
Fashion Institute of Technology	38.86		
Faulkner University	25.26		
Finlandia University	33.39		
Fisk University	10.51		
Flagler College-St Augustine	34.79		
Florida Atlantic University	38.52		
Florida International University	38.82		
Florida Memorial University	38.99		
Fordham University	42.48		
Fort Valley State University	38.84		
Franklin and Marshall College	41.38	600.00	630.00
Franklin W Olin College of Engineering	16.27	693.33	728.83
Freed-Hardeman University	43.66		
Fresno Pacific University	9.34		
Furman University		593.33	
Gardner-Webb University	31.75		
George Washington University	36.46	596.00	610.00

Georgetown University	20.26	643.33	650.00
Georgia College and State University	43.67		
Georgia Institute of Technology-Main Campus		596.36	650.00
Georgia Southern University	45.35		
Georgia State University	40.98		
Gettysburg College	39.58	606.67	610.00
Goddard College	37.50		
Gonzaga University	33.43		
Gordon College	40.29		
Gordon State College	42.56		
Grace Bible College	29.72		
Grace University	20.13		
Graceland University-Lamoni	39.27		
Grambling State University	34.84		
Grand Canyon University	34.12		
Greensboro College	41.14		
Grinnell College	41.54	620.00	627.00
Gwynedd Mercy University	42.05		
Hamilton College	31.34	631.00	642.22
Hampshire College		601.67	
Hampton University	38.76		
Hannibal-LaGrange University	37.84		
Hardin-Simmons University	36.72		
Harvard University	8.51	695.00	700.00
Harvey Mudd College	30.30	673.00	728.00
Haskell Indian Nations University	44.68		
Haverford College	27.27	645.83	646.67
Henderson State University	31.30		
Hendrix College		593.33	
Herzing University-Atlanta	21.08		
Herzing University-Winter Park	44.44		
Hillsdale Free Will Baptist College	45.18		
Holy Names University	27.20		
Hondros College	44.88		
Hope International University	38.63		
Houston Baptist University	38.38		
Huston-Tillotson University	40.50		
Illinois Institute of Technology		598.00	623.17

Illinois Wesleyan University	42.96	600.00
Indiana Institute of Technology	8.18	
Institute of American Indian and Alaska Native Culture	18.90	
ITT TECHNICAL INSTITUTE	43.94	
ITT Technical Institute-Akron	35.80	
ITT Technical Institute-Albuquerque	38.32	
ITT Technical Institute-Arlington	36.99	
ITT Technical Institute-Arlington Heights	41.54	
ITT Technical Institute-Arnold	44.81	
ITT Technical Institute-Atlanta	36.03	
ITT Technical Institute-Aurora	33.78	
ITT Technical Institute-Austin	39.88	
ITT Technical Institute-Baton Rouge	34.14	
ITT Technical Institute-Bessemer	42.87	
ITT Technical Institute-Boise	33.68	
ITT Technical Institute-Canton	32.23	
ITT Technical Institute-Cary	44.04	
ITT Technical Institute-Chantilly	42.77	
ITT Technical Institute-Charlotte North	35.87	
ITT Technical Institute-Charlotte South	42.09	
ITT Technical Institute-Chattanooga	40.90	
ITT Technical Institute-Clive	41.50	
ITT Technical Institute-Clovis	31.73	
ITT Technical Institute-Columbia	31.77	
ITT Technical Institute-Columbus	29.80	
ITT Technical Institute-Concord	41.63	
ITT Technical Institute-Cordova	43.48	
ITT Technical Institute-Corona	31.96	
ITT Technical Institute-Dayton	39.65	
ITT Technical Institute-Dearborn	39.29	
ITT Technical Institute-DeSoto	33.18	
ITT Technical Institute-Duluth	32.90	
ITT Technical Institute-Earth City	39.93	
ITT Technical Institute-Eden Prairie	38.10	
ITT Technical Institute-Everett	40.39	
ITT Technical Institute-Fort Lauderdale	39.55	
ITT Technical Institute-Fort Myers	32.39	
ITT Technical Institute-Fort Wayne	38.77	

ITT Technical Institute-Green Bay	42.37
ITT Technical Institute-Greenfield	42.24
ITT Technical Institute-Greenville	39.84
ITT Technical Institute-Henderson	39.44
ITT Technical Institute-Hialeah	35.44
ITT Technical Institute-High Point	36.27
ITT Technical Institute-Hilliard	33.22
ITT Technical Institute-Houston North	41.78
ITT Technical Institute-Houston West	34.02
ITT Technical Institute-Indianapolis	33.10
ITT Technical Institute-Jacksonville	36.51
ITT Technical Institute-Kansas City	42.57
ITT Technical Institute-Kennesaw	32.72
ITT Technical Institute-Knoxville	42.77
ITT Technical Institute-Lake Mary	39.15
ITT Technical Institute-Las Vegas	35.93
ITT Technical Institute-Lathrop	40.63
ITT Technical Institute-Lexington	39.77
ITT Technical Institute-Little Rock	38.78
ITT Technical Institute-Louisville	39.30
ITT Technical Institute-Madison	40.36
ITT Technical Institute-Madison	40.94
ITT Technical Institute-Maumee	38.94
ITT Technical Institute-Merrillville	36.42
ITT Technical Institute-Mobile	30.60
ITT Technical Institute-Murray	38.89
ITT Technical Institute-Nashville	39.00
ITT Technical Institute-National City	41.45
ITT Technical Institute-Newburgh	37.54
ITT Technical Institute-Norfolk	40.36
ITT Technical Institute-North Charleston	45.83
ITT Technical Institute-Norwood	36.50
ITT Technical Institute-Norwood	34.03
ITT Technical Institute-Oak Brook	39.10
ITT Technical Institute-Oklahoma City	35.28
ITT Technical Institute-Omaha	39.89
ITT Technical Institute-Orange	38.89
ITT Technical Institute-Orland Park	35.87

ITT Technical Institute-Owings Mills	43.33		
ITT Technical Institute-Phoenix	39.04		
ITT Technical Institute-Portland	40.22		
ITT Technical Institute-Rancho Cordova	39.95		
ITT Technical Institute-Richardson	35.14		
ITT Technical Institute-Richmond	39.89		
ITT Technical Institute-Saint Rose	43.85		
ITT Technical Institute-Salem	37.27		
ITT Technical Institute-San Antonio	33.33		
ITT Technical Institute-San Bernardino	45.75		
ITT Technical Institute-Seattle	35.62		
ITT Technical Institute-South Bend	38.59		
ITT Technical Institute-Spokane Valley	41.13		
ITT Technical Institute-Springfield	42.74		
ITT Technical Institute-St Petersburg	35.00		
ITT Technical Institute-Strongsville	35.51		
ITT Technical Institute-Swartz Creek	39.94		
ITT Technical Institute-Tallahassee	39.77		
ITT Technical Institute-Tampa	39.95		
ITT Technical Institute-Tempe	39.78		
ITT Technical Institute-Torrance	41.37		
ITT Technical Institute-Troy	39.80		
ITT Technical Institute-Tucson	32.04		
ITT Technical Institute-Tulsa	37.46		
ITT Technical Institute-Warrensville Heights	34.76		
ITT Technical Institute-Webster	39.78		
ITT Technical Institute-Westminster	44.15		
ITT Technical Institute-Wichita	34.25		
ITT Technical Institute-Wilmington	27.66		
ITT Technical Institute-Wyoming	40.19		
Jackson State University	33.71		
Jacksonville University	42.15		
Jefferson College of Health Sciences	39.13		
Jewish Theological Seminary of America		635.33	625.71
John Brown University	36.13		
Johns Hopkins University	27.78	630.00	660.83
Johnson & Wales University-Denver	44.84		
Johnson C Smith University	32.81		

Johnson State College	38.44		
Johnson University Florida	34.99		
Kalamazoo College		610.00	
Kendall College	38.95		
Kenrick Glennon Seminary	33.33		
Kentucky Christian University	33.49		
Kentucky Mountain Bible College	30.96		
Kentucky State University	30.03		
Kentucky Wesleyan College	21.21		
Kenyon College	36.09	625.83	610.00
Kettering College	30.18		
Kettering University	22.96		610.00
Keuka College	43.27		
King University	31.37		
Knox College		605.00	
LA College International	24.34		
La Sierra University	38.75		
Laboure College	26.56		
Lafayette College	38.00	590.00	612.50
Laguna College of Art and Design	39.86		
Lake Erie College	23.87		
Lake Forest College	33.58		
Lamar University	45.55		
Lander University	42.28		
Lane College	34.13		
Langston University	38.84		
Laurel University	39.49		
Lawrence Technological University	43.65		
Lawrence University		590.00	
Le Moyne-Owen College	30.90		
Lehigh University	36.35	595.00	636.67
Lesley University	40.49		
LeTourneau University	43.35		
Lewis & Clark College		608.89	610.00
Lexington College	37.32		
Liberty University	32.22		
Life University	33.92		
Lincoln Christian University	44.87		

Lincoln Memorial University	36.59		
Lindenwood University	40.79		
Lindsey Wilson College	29.54		
LIU Post	22.95		
Livingstone College	27.41		
Longy School of Music of Bard College	44.23		
Lourdes University	34.59		
Macalester College	40.60	637.27	626.36
Macon State College	44.81		
Maharishi University of Management	42.24		
Maine Maritime Academy	36.00		
Manhattan School of Music	36.55		
Manhattanville College	36.57		
Maria College of Albany	21.61		
Marist College	36.67		
Marlboro College		590.00	
Martin Methodist College	42.06		
Mary Baldwin College	44.47		
Marygrove College	40.32		
Maryland Institute College of Art	42.78		
Marylhurst University	44.12		
Marymount California University	44.67		
Marymount College of Fordham University	44.44		
Maryville College	20.12		
Maryville University of Saint Louis	37.82		
Massachusetts College of Art and Design	45.15		
Massachusetts Institute of Technology	13.08	670.83	730.83
Massachusetts Maritime Academy	32.84		
Memphis College of Art	41.65		
Menlo College	37.90		
Mercy College	40.70		
Mercy College of Health Sciences	38.06		
Metropolitan College of New York	35.61		
Mid-Atlantic Christian University	35.37		
Middle Tennessee State University	36.87		
Middlebury College	21.18	640.89	648.89
Midwest University	40.00		
Midwestern Baptist Theological Seminary	36.15	659.00	

Milwaukee School of Engineering		620.00	
Minnesota School of Business-Waite Park	28.14		
Mississippi College	44.49		
Mississippi State University	34.23		
Mississippi University for Women	43.12		
Mississippi Valley State University	24.91		
Missouri University of Science and Technology		590.00	610.00
Missouri Valley College	29.83		
Montreat College	29.98		
Moore College of Art and Design	38.42		
Morgan State University	35.17		
Mount Carmel College of Nursing	43.89		
Mount Holyoke College	42.08		
Mount Ida College	41.38		
Mount Mary University	38.88		
Mt Sierra College	40.15		
Muhlenberg College	40.99		
Musicians Institute		620.00	650.00
National Louis University	33.33		
Nazarene Bible College	44.38		
Nebraska Methodist College of Nursing & Allied Health	34.54		
Neumont University	38.79		
Nevada State College	40.53		
New College of Florida		638.33	
New England Culinary Institute	12.55		
New England School of Communications	43.08		
New Hampshire Institute of Art	45.61		
New Hope Christian College-Eugene	37.16		
New Jersey City University	39.88		
New Mexico Institute of Mining and Technology	33.66		
New York Institute of Technology-Central Islip	33.33		
New York School of Interior Design	34.20		
New York University	34.44	614.17	620.00
Newberry College	33.74		
Newman University	43.67		
Newschool of Architecture and Design	40.30		
North Central University	28.53		
North Park University	34.35		

Northeastern University	38.31	613.33	630.00
Northern Arizona University	32.28		
Northwest Christian University	44.79		
Northwestern Health Sciences University	42.86		
Northwestern University	27.18	661.67	679.17
Northwood University-Texas	44.60		
Nossi College of Art	37.78		
Notre Dame College	38.02		
NOTRE DAME COLLEGE	19.21		
Nova Southeastern University	44.78		
Oakwood University	36.61		
Oberlin College	33.67	642.50	622.83
Occidental College	41.84	595.56	610.00
Oglethorpe University	42.92		
Ohio Christian University	33.42		
Ohio State University-Main Campus			610.00
Ohio Valley University	34.14		
Oklahoma Christian University	39.97	660.00	670.00
Olivet College	26.36		
O'More College of Design	37.55	600.00	
Oregon College of Art and Craft	40.00		
Otis College of Art and Design	43.89		
Our Lady of Holy Cross College	31.96		
Our Lady of the Lake College	24.82		
Our Lady of the Lake University	42.28		
Pacific Rim Christian University	37.78		
Pacific Union College	36.07		
Pacific University	45.61		
Paine College	29.34		
Palm Beach Atlantic University	43.26		
Park University	31.06		
Paul Quinn College	22.46		
Pennsylvania Academy of the Fine Arts	35.08		
Pennsylvania College of Art and Design	40.41		
Pennsylvania College of Health Sciences	35.19		
Pennsylvania State University-Penn State Harrisburg	33.46		
Pepperdine University	31.38		
Philander Smith College	39.74		

Phillips Beth Israel School of Nursing	22.92		
Piedmont College	44.47		
Pillar College	39.76		
Pittsburg State University	7.00		
Pitzer College	27.90	600.00	
Platt College-Aurora	33.33		
Platt College-North OKC	17.15		
Plaza College	28.47		
Point University	36.38		
Polytechnic Institute of New York University			645.00
Pomona College	18.22	689.17	686.67
Post University	34.13		
Prairie View A & M University	40.34		
Pratt Institute-Main	42.82		
Presentation College	36.46		
Princeton University	10.05	689.09	700.91
Providence Christian College	39.02		
Providence College	43.40		
Puget Sound Christian College	38.04		
Quinnipiac University	44.82		
Radford University	32.73		
Ramapo College of New Jersey	42.07		
Reed College	39.65	660.83	623.64
Regis University	33.04		
Reinhardt University	25.52		
Remington College-Tampa Campus	44.63		
Rensselaer Polytechnic Institute	41.91	606.67	650.83
Rhode Island School of Design	32.59		
Rhodes College	36.23	598.00	610.00
Rice University	22.46	650.00	681.67
Rivier University	26.12		
Robert Morris University Illinois	30.52		
Rockford University	42.37		
Rocky Mountain College	37.22		
Rocky Mountain College of Art and Design	19.24		
Roosevelt University	42.95		
Rose-Hulman Institute of Technology			632.50
Rowan University	45.14		

Rust College	38.61		
Rutgers University-New Brunswick		630.00	
Sage College of Albany	28.45		
Saint Augustine's University	40.43		
Saint Joseph's University		593.00	
Saint Leo University	24.89		
Saint Louis Christian College	35.19		
Saint Mary-of-the-Woods College	38.57		
Saint Peter's University	44.52		
Saint Xavier University	24.97		
Salem College	37.27		
Salisbury University	17.44		
San Diego Christian College	41.04		
San Diego State University	36.71		
San Diego State University-Imperial Valley Campus	39.98		
San Francisco Art Institute	27.05		
San Francisco Conservatory of Music	41.31		
Sanford-Brown College-Tampa	31.46		
Santa Clara University		590.00	610.00
Sarah Lawrence College	42.27	610.00	
Savannah State University	32.24		
Schiller International University	29.88		
Scripps College	38.87	632.50	622.00
Sewanee-The University of the South		590.00	
Shaw University	42.76		
Shimer College	33.33		
Sierra Nevada College	26.24		
Simmons College	18.68		
Skidmore College	40.10		
Smith College	44.05	592.00	
Soka University of America	38.91		
South University-Tampa	1.64		
South University-The Art Institute of Dallas	40.07		
Southeastern Bible College	33.01	690.00	690.00
Southeastern Louisiana University	43.70		
Southern Adventist University	45.22		
Southern California Institute of Technology	29.23		
Southern Connecticut State University	29.23		

Southern Illinois University-Carbondale	44.12		
Southern Methodist University		590.00	
Southern New Hampshire University	30.25		
Southern University and A & M College	40.30		
Southern University at New Orleans	18.78		
Southern Virginia University	41.76		
Southwest University of Visual Arts-Albuquerque		590.00	
Southwestern Assemblies of God University	36.90		
Southwestern College	27.53		
Spalding University	40.21		
Spartan College of Aeronautics and Technology	37.79		
Spelman College	37.29		
SPURGEON BAPTIST BIBLE COLLEGE	24.38		
St Francis College	32.03		
St John's College		651.67	
St John's University-New York	44.71		
St Lawrence University	39.71		
St Louis College of Pharmacy	45.18		637.00
St Luke's College	37.05		
St Mary's College of Maryland		590.00	
St Olaf College		593.75	
St Thomas University	41.01		
St Vincent Catholic Medical Center New York-Brooklyn and Queens	31.48		
St. Gregory's University	42.65		
Stanford University	10.22	665.83	686.67
State University of New York at New Paltz	37.99		
Stephens College	38.61		
Stevens Institute of Technology	41.06		622.73
Stillman College	38.03		
Stockton University	42.90		
Stonehill College	43.34		
Stony Brook University	41.10		
Summit University of Pennsylvania	41.20		
SUNY at Binghamton	41.08	595.00	616.25
SUNY at Purchase College	32.01		
SUNY Buffalo State	44.14		
SUNY College at Brockport	41.10		
SUNY College at Cortland	42.29		

SUNY College at Geneseo	40.09	603.75	624.00
SUNY College at Old Westbury	44.74		
SUNY College at Plattsburgh	44.32		
SUNY College of Agriculture and Technology at Cobleskill	35.78		
SUNY College of Environmental Science and Forestry	43.09		
SUNY College of Technology at Delhi	39.94		
SUNY Oneonta	42.35		
SUNY Polytechnic Institute	35.08		
Swarthmore College	19.71	675.83	670.83
Talladega College	40.12		
Talmudic College of Florida	25.00		
Tennessee State University	40.99		
Tennessee Temple University	23.18		
Texas A & M International University	32.24		
Texas A & M University-Commerce	42.69		
Texas A & M University-Kingsville	20.26		
Texas A & M University-Texarkana	33.31		
Texas Christian University	39.26		
Texas Southern University	37.56		
Texas Tech University Health Sciences Center	34.96		
The Art Institute of Atlanta	40.99		
The Art Institute of Charleston	43.14		
The Art Institute of Charlotte	36.19		
The Art Institute of Cincinnati-AIC College of Design	21.43		
The Art Institute of Fort Lauderdale	42.00		
The Art Institute of Houston	37.55		
The Art Institute of Las Vegas	44.72		
The Art Institute of Michigan	39.42		
The Art Institute of Ohio-Cincinnati	32.68		
The Art Institute of Philadelphia	43.43		
The Art Institute of Phoenix	43.64		
The Art Institute of Pittsburgh	41.93		
The Art Institute of Raleigh-Durham	42.16		
The Art Institute of Salt Lake City	38.69		
The Art Institute of San Antonio	43.94		
The Art Institute of Seattle	41.79		
The Art Institute of Tennessee-Nashville	39.79		
The Art Institute of Virginia Beach	43.21		

The Art Institute of Washington	43.19		
The Art Institutes International—Kansas City	43.54		
The Baptist College of Florida	40.38		
The Boston Conservatory	38.80		
The California Maritime Academy	26.00		
The Christ College of Nursing and Health Sciences	38.46		
The College of New Jersey	43.70		
The College of Saint Rose	38.39		
The College of Saints John Fisher & Thomas More	5.00	610.00	650.00
The Illinois Institute of Art-Chicago	39.73		
The Illinois Institute of Art-Schaumburg	39.87		
The Juilliard School	7.08		
The King—TM's College		605.00	
The Lincoln University	34.87		
The National Hispanic University	26.14		
The New England Conservatory of Music	32.24	799.00	799.00
The New England Institute of Art	39.70		
The University of Alabama	43.53		
The University of Tennessee-Knoxville	44.25		
The University of Tennessee-Martin	44.87		
The University of Texas at Austin	44.43		
The University of Texas at Tyler	45.31		
The University of Texas Health Science Center at San Antonio	25.00		
The University of the Arts	44.77		
Thomas Aquinas College		612.00	
Thomas Jefferson University	18.62		
Tiffin University	38.56		
Toccoa Falls College	41.13		
Tougaloo College	30.31		
Touro University Worldwide	42.86		
Towson University	44.16		
Transylvania University	25.58		
Trine University-Regional/Non-Traditional Campuses	30.30		
Trinity Bible College	30.92		
Trinity College	37.22	594.44	611.67
Trinity College of Florida	34.29		
Trinity College of Nursing & Health Sciences	33.24		
Trinity International University-Florida	37.22		

Trinity Lutheran College	45.51		
Trinity University		596.67	611.43
Trocaire College	35.75		
Truett-McConnell College	43.89		
Tufts University	25.48	651.67	662.50
Tulane University of Louisiana	32.36	620.00	623.33
Tuskegee University	35.11		
Union College	43.88		
Union College	26.44		
Union College	41.99	590.00	620.00
United States Merchant Marine Academy	22.37	620.00	
University of Advancing Technology	33.30		
University of Arkansas at Little Rock	32.70		
University of Arkansas at Pine Bluff	31.26		
University of Baltimore	33.27		
University of California-Berkeley	22.89	594.00	626.67
University of California-Davis	45.21		
University of California-Irvine	43.92		
University of California-Los Angeles	24.52		610.00
University of California-San Diego	39.80		612.50
University of California-Santa Barbara	44.96		
University of California-Santa Cruz			620.00
University of Central Florida	45.05		
University of Chicago	31.56	676.36	670.91
University of Connecticut	44.71		
University of Connecticut-Stamford	44.14		
University of Delaware	43.55		
University of Florida	42.79		
University of Hartford	41.45		
University of Houston-Victoria	40.73		
University of Illinois at Springfield	43.29		
University of Illinois at Urbana-Champaign			655.00
University of Jamestown	29.85		
University of La Verne	39.41		
University of Mary Hardin-Baylor	41.18		
University of Mary Washington	23.08		
University of Maryland-College Park	42.96		612.50
University of Massachusetts-Lowell	40.96		

University of Miami	40.91	596.67	622.50
University of Michigan-Ann Arbor	39.77	595.00	631.83
University of Michigan-Dearborn			610.00
University of Minnesota-Twin Cities			615.00
University of New Hampshire at Manchester	35.73		
University of North Alabama	43.86		
University of North Carolina at Chapel Hill	34.43	592.00	612.50
University of North Carolina School of the Arts	43.21		
University of North Georgia	34.75		
University of Notre Dame	28.70	638.33	662.50
University of Pennsylvania	17.71	650.00	682.50
University of Portland	27.25		
University of Richmond	37.43	606.00	620.00
University of Rochester	39.58	596.67	630.83
University of Saint Mary	44.74		
University of San Diego	42.59		
University of Science and Arts of Oklahoma	32.89		
University of South Alabama	41.11		
University of South Dakota	10.64		
University of South Florida-Main Campus	40.36		
University of South Florida-St Petersburg	45.65		
University of Southern California	25.27	617.27	649.09
University of Southern Mississippi	31.05		
University of St Francis	45.00		
University of St Thomas			610.00
University of the Cumberland	44.63		
University of the Incarnate Word	34.81		
University of the Pacific	38.31		
University of the Southwest	32.68		
University of Tulsa	40.26		
University of Virginia-Main Campus	35.78	602.50	622.50
University of West Alabama	39.78		
University of Wisconsin-Madison			618.57
Urbana University	41.72		
Ursinus College	45.06		
Ursuline College	42.77		
Valparaiso University	25.30		
Vanderbilt University	25.06	645.00	670.00

VanderCook College of Music		630.00	
Vassar College	26.93	660.00	642.22
Vatterott College-Berkeley	37.25		
Vatterott College-Oklahoma City	27.64		
Vennard College	34.31		
Vermont Technical College	44.03		
Victory University	28.46		
Villanova University	43.08	590.00	616.25
Virginia Intermont College	37.34		
Virginia Wesleyan College	36.85		
Visible Music College	44.21		
Voorhees College	37.37		
Wake Forest University	40.12	608.57	627.14
Warner Pacific College	26.46		
Warner University	44.64		
Washington & Jefferson College	39.16		
Washington Adventist University	40.21		
Washington and Lee University	25.23	651.67	652.50
Washington Bible College-Capital Bible Seminary	37.99		
Washington University in St Louis	20.48	670.00	694.17
Watkins College of Art Design & Film	36.15		
Webb Institute	36.24	640.00	697.50
Webber International University	40.32		
Wellesley College	35.40	644.17	636.67
Wesley College	32.35		
Wesley College	45.00		
Wesleyan University	25.41	642.27	652.73
West Chester University of Pennsylvania	41.45		
West Coast University-Dallas	34.54		
West Coast University-Ontario	39.91		
West Coast University-Orange County	42.25		
West Texas A & M University	43.92		
West Virginia University	37.39		
West Virginia University Hospital Departments of Rad Tech and Nutrition	14.40		
Western Carolina University	39.82		
Western Governors University	39.52		
Western Illinois University	21.06		
Westwood College-Anaheim	35.03		

Westwood College-Atlanta Peachtree Center Campus	42.21		
Westwood College-Aurora Campus	43.08		
Westwood College-Chicago Loop	42.11		
Westwood College-Denver North	41.15		
Westwood College-Dupage	35.69		
Westwood College-Houston South	43.53		
Westwood College-Inland Empire	35.42		
Westwood College-Los Angeles	34.79		
Westwood College-Northlake	42.16		
Westwood College-O'Hare Airport	43.58		
Westwood College-River Oaks	36.75		
Wheaton College	43.15		
Wheaton College		612.50	610.91
Whitman College	43.36	617.25	616.00
Wilberforce University	27.75		
Willamette University	41.97		
William Carey University	27.42		
William Jessup University	44.79		
William Peace University	45.65		
William Woods University	38.60		
Williams College	19.61	660.00	659.09
Wilmington College	12.77		
Wilson College	18.57		
Wisconsin Lutheran College			630.00
Woodbury University	38.08		
Worcester Polytechnic Institute			625.00
Yale University	9.60	695.83	697.50
Yale-New Haven Hospital Dietetic Internship	31.58		

APPENDIX B

EXPANDED SAMPLE ADDITIONS

College Name	Admission Rate	SAT Reading	SAT Math
Academy of Couture Art	55.56		
Adams State University	56.18		
Adrian College	57.06		
Adventist University of Health Sciences	52.13		
AIB College of Business	56.42		
Albany College of Pharmacy and Health Sciences	53.92		580.00
Albright College	51.98		
Allegheny College	57.34	570.00	
Alverno College	54.74		
American InterContinental University-Online	52.05		
American Jewish University	56.82		
Anderson University	55.20		
Antioch College	55.71		
Arcadia University	55.08		
Argosy University-Denver	55.56		
Armstrong State University	56.36		
Asbury University	55.79		
Ashland University Dwight Schar College of Nursing	56.48		
Augsburg College	53.10		
Augusta State University	54.12		
Aurora University	55.65		
Austin College	52.46	580.00	580.00
Ave Maria College		570.00	
Averett University-Non-Traditional Programs	48.50		
Azusa Pacific University	50.63		
Baker University	52.88		
Baltimore International College	51.98		
Barry University	53.94		
Bay State College	57.58		
Bellarmino University	52.22		
Benedictine University		570.00	
Bethel College-Indiana	55.88		
Bethel College-North Newton		570.00	
Bethel University	52.67		
Bethel University		570.00	
Birmingham Southern College	57.01		
Birthingway College of Midwifery	25.00		
Blackburn College	54.81		
Bluffton University	57.51		
Bridgewater College	53.26		
Brigham Young University-Provo	54.91	573.33	583.33
Bryan College-Dayton	52.60		
Bryant & Stratton College-Cleveland	52.50		
Burlington College	53.76		

Cairn University-Langhorne	51.31		
Caldwell University	57.18		
California State University-Bakersfield	52.04		
California State University-Fresno	55.91		
California State University-Northridge	46.24		
California State University-Sacramento	50.58		
Carlos Albizu University-Miami	55.78		
Carlow University	48.67		
Centenary College of Louisiana	54.31		
Central Connecticut State University	54.70		
Chamberlain College of Nursing-Arizona	52.78		
Chamberlain College of Nursing-Ohio	53.13		
Chamberlain College of Nursing-Virginia	50.00		
Christian Life College	53.39		
Christopher Newport University	51.88		
Cincinnati Christian University	51.09		
Citadel Military College of South Carolina	57.05		
Clarion University of Pennsylvania	46.66		
Clark Atlanta University	50.65		
Clark University	56.20		
Clarke University	55.60		
Cleary University	56.25		
Clemson University	53.31		584.29
Cleveland Chiropractic College of Los Angeles	49.41		
Cleveland State University	46.72		
Cleveland University-Kansas City	51.40		
Coe College		580.00	600.00
Cogswell College	52.30		
Coleman University	49.41		
College of Charleston		570.00	
College of Saint Elizabeth	52.62		
COLLEGE OF THE SOUTHWEST-CARLSBAD	50.00		
College of Visual Arts	50.00		
Columbia College	52.36		598.00
Columbia College-Hollywood	55.86		
Columbus College of Art and Design	54.15		
Columbus State University	52.90		
Concord University	50.34		
Concordia University-Texas	50.89		
Covenant College	57.43		
Daemen College	50.29		
Davis & Elkins College	54.84		
Dell'Arte International School of Physical Theatre	25.00		
DePauw University	55.70		
DeVry College of New York	53.04		
DeVry University-Florida	47.92		
DeVry University-Georgia	51.70		

DeVry University-Kentucky	53.85	
DeVry University-Maryland	47.06	
DeVry University-Michigan	56.55	
DeVry University-Missouri	55.08	
DeVry University-New Jersey	55.90	
DeVry University-Oregon	50.00	
DeVry University-Pennsylvania	55.98	
DeVry University-Utah	57.50	
DeVry University-Virginia	52.06	
DeVry University-Washington	52.61	
Dominican University	57.10	
Dominican University of California	53.37	
Drake University		580.00
Drexel University	55.71	580.00
D'Youville College	51.81	
Earlham College		573.33
East Texas Baptist University	54.06	
Eastern Michigan University	52.83	
Eastern Nazarene College	54.37	
Eastern University	46.95	
Elizabeth City State University	53.76	
Emmanuel College	54.73	
Epic Bible College	50.56	
Everest College-Mesa	46.24	
Everest University-Lakeland	47.06	
Everest University-Largo	56.03	
Everest University-South Orlando	51.80	
Everest University-Tampa	51.18	
Everglades University	56.07	
Fairfield University	50.75	580.00
Fairleigh Dickinson University-Metropolitan Campus	53.07	
Fairmont State University	55.82	
Faith Baptist Bible College and Theological Seminary	56.98	570.00
Fashion Institute of Design & Merchandising-Los Angeles	57.01	
Fayetteville State University	54.96	
Ferris State University	52.34	
Fisher College	50.19	
Five Towns College	51.69	
Florida Agricultural and Mechanical University	48.49	
Florida College	52.67	
Florida Institute of Technology	57.37	
Florida Southern College	55.74	
Florida State University	51.83	
Framingham State University	54.97	
Francis Marion University	56.24	
Friends University	52.67	
Frostburg State University	55.24	

Gallaudet University	54.99		
George Mason University	53.17		
Georgia Southwestern State University	56.94		
Globe University-Woodbury	52.67		
Goldey-Beacom College	54.37		
Goshen College	51.87		
Goucher College		570.00	
Grace College and Theological Seminary	56.34		
Grand Valley State University	52.18		
Guilford College	54.58		
Gustavus Adolphus College		575.00	585.00
Hampden-Sydney College	55.11		
Harrisburg University of Science and Technology	54.27		
Harrison College-Fort Wayne	52.48		
Harris-Stowe State University	46.95		
GoHebrew Theological College		570.00	580.00
Herzing University-Birmingham	52.50		
Herzing University-Kenner	56.90		
Hiwassee College	50.00		
Hobart William Smith Colleges	54.44		
Hofstra University	54.59		
Hood College	53.87		
Howard Payne University	50.26		
Howard University	51.15		
Illinois College	53.52		
Indiana University of Pennsylvania-Main Campus	54.75		
Indiana Wesleyan University-Marion	54.34	570.00	
Iowa Wesleyan University	53.08		
Ithaca College	56.35		
ITT Technical Institute-Brooklyn Center	57.53		
ITT Technical Institute-Johnson City	47.06		
ITT Technical Institute-Oxnard	52.33		
ITT Technical Institute-San Dimas	50.75		
ITT Technical Institute-Springfield	48.48		
ITT Technical Institute-Sylmar	50.48		
ITT Technical Institute-West Palm Beach	53.31		
ITT Technical Institute-Youngstown	51.38		
Johnson & Wales University-Charlotte	56.50		
Johnson & Wales University-North Miami	55.70		
Johnson University	53.60		
Jones International University	51.60		
Judson College		570.00	
Kansas State University	50.62		
Kansas Wesleyan University	53.27		
Kean University	53.26		
Keiser University-Ft Lauderdale	53.69		
Kennesaw State University	56.54		

Kuyper College	50.84	
La Roche College	53.00	
LaGrange College	52.58	
Lakeland College	49.63	
Lambuth University	51.13	
Lancaster Bible College	53.89	
Landmark College	53.67	
Lasell College	45.98	
Lewis University	55.94	
LIM College	51.46	
Limestone College	51.59	
Lipscomb University	53.45	
LIU Brooklyn	55.88	
Los Angeles College of Music	54.03	
Louisiana College	51.38	
Louisiana State University-Shreveport	48.42	
Loyola Marymount University	53.28	
Loyola University Chicago	54.93	
Loyola University Maryland	55.32	
Loyola University New Orleans	56.64	570.00
Lycoming College		580.00
MacMurray College	53.51	
Manhattan College	53.48	
Maranatha Baptist University	48.07	
Marian University	53.95	
Marquette University	56.03	
Mars Hill University	56.95	
Marymount Manhattan College	56.98	
Massachusetts College of Liberal Arts	47.04	
McMurry University	55.28	
McPherson College	57.20	
MCPHS University	47.93	
MERCER UNIVERSITY IN ATLANTA	55.06	
Mercy College of Ohio	48.50	
Mesivtha Tifereth Jerusalem of America	53.57	
Metropolitan State University	53.68	
Miami University-Oxford		580.00
Michigan Technological University		586.00
Mid-America College of Funeral Service	51.43	
Mid-Continent University	53.63	
Midland University	51.13	
Midway University	49.20	
Midwestern State University	53.44	
Miller-Motte College-Wilmington	50.15	
Millersville University of Pennsylvania	55.26	
Millikin University	55.98	
Mills College	56.47	

Millsaps College	54.77	
Minneapolis College of Art and Design	57.02	
Minnesota School of Business-Plymouth	51.05	
Minot State University	53.64	
Misericordia University	57.28	
Missouri Baptist University	52.27	
Missouri State University-Springfield	52.22	
Molloy College	56.07	
Monmouth College		570.00
Monmouth University	56.98	
Monroe College-New Rochelle	51.78	
Montana State University	57.57	
Montclair State University	52.55	
Morehead State University	54.51	
Morehouse College	54.77	
MORRIS BROWN COLLEGE	49.53	
Mount St Mary's University	55.46	
Mount Washington College	57.46	
Naropa University	56.72	
New Jersey Institute of Technology	49.15	
New York College of Health Professions	52.71	
New York Film Academy	52.40	
North Carolina A & T State University	54.43	
North Carolina Central University	51.04	
North Carolina State University at Raleigh	52.91	590.00
North Carolina Wesleyan College	50.16	
North Greenville University	51.78	
Northeastern State University	54.21	
Northern Illinois University	54.43	
Northern Kentucky University	46.70	
Northland College	57.34	
Northland International University	54.01	
Northpoint Bible College	53.00	
Northwest College of Art & Design	53.03	
Northwood University-Florida	52.09	
Notre Dame of Maryland University	54.26	
Nyack College	56.86	
Oak Hills Christian College	55.71	
Oakland City University	48.96	
Oklahoma State University-Main Campus	50.99	
Oklahoma Wesleyan University	50.56	
Oregon Institute of Technology	55.86	
Oregon State University	51.20	
Pacific College of Oriental Medicine-Chicago	52.73	
Pacific College of Oriental Medicine-New York	48.00	
Pacific Northwest College of Art	53.34	
Pennsylvania State University-Main Campus	53.73	

Pfeiffer University	55.87		
Piedmont International University	52.58		
Pine Manor College	52.92		
Point Loma Nazarene University	54.43		590.00
Purdue University-Calumet Campus	47.15		
Queens University of Charlotte	54.66		
Randolph-Macon College	55.06		
Regent University	49.83		
Remington College-Colorado Springs Campus	56.35		
Remington College-Heathrow Campus	50.00		
Remington College-Largo Campus	55.74		
Remington College-Memphis Campus	55.06		
Remington College-Mobile Campus	50.76		
Remington College-San Diego Campus	50.17		
Remington College-Tempe Campus	50.35		
Research College of Nursing	55.52		
Ripon College		570.00	580.00
Roberts Wesleyan College	48.98		
Rochester College	57.08		
Rochester Institute of Technology			580.00
Rogers State University	53.13		
Rollins College	54.79		
Rosemont College	51.91		
Rutgers University-Camden	52.91		580.00
Rutgers University-Newark	50.72		
Sacred Heart University	53.73		
Saint Johns University			580.00
Saint Joseph's College-New York	51.44		
Salem International University	47.33		
Salem State University	56.66		
Salve Regina University	55.16		
Sam Houston State University	52.57		
Samuel Merritt University	55.83		
San Jose State University	54.24		
Savannah College of Art and Design	51.27		
Schreiner University	49.55		
Sentara College of Health Sciences	50.49		
Seton Hill University	53.69		
SI TANKA UNIVERSITY-HURON CAMPUS	54.57		
Siena College	53.34		
Siena Heights University	54.19		
Silver Lake College of the Holy Family	48.96		
Simpson University	54.69		
Skyline College-Richmond	50.00		
Skyline College-Roanoke	50.28		
Slippery Rock University of Pennsylvania	49.34		
South Carolina State University	54.22		

South Universityâ€“Savannah Online	54.82	
South Universityâ€“Virginia Beach	48.00	
South University-Columbia	50.80	
South University-Savannah	56.82	
South University-The Art Institute of Fort Worth	53.96	
South University-West Palm Beach	50.39	
Southeast Missouri State University	54.00	
Southern Catholic College	55.14	
Southern Utah University	57.33	
Southern Wesleyan University	57.11	
Southwest Baptist University	47.67	
Southwest Minnesota State University	52.25	
Southwestern Adventist University	49.89	
Southwestern Christian University	53.96	
Southwestern University	570.50	580.00
Spring Hill College	52.50	
St Catherine University	55.71	
St Mary's University	54.86	
Stephen F Austin State University	52.69	
Sterling College	46.15	
Sterling College	53.25	
Stetson University	52.61	
Stevens-Henager College	51.56	
Stevens-Henager College	57.60	
Stevenson University	57.10	
Stevens-The Institute of Business & Arts	50.00	
Sullivan College of Technology and Design	54.12	
SUM Bible College and Theological Seminary	53.85	
SUNY at Albany	52.75	
SUNY at Fredonia	53.44	
SUNY College at Oswego	51.61	
SUNY College of Technology at Alfred	51.09	
SUNY Maritime College	56.29	
Syracuse University	51.06	580.00
Tarleton State University	54.73	
Tennessee Wesleyan College	51.19	
Texas A & M University-Galveston	55.28	
Texas Lutheran University	52.59	
Texas State University	56.26	
Texas Wesleyan University	50.34	
Texas Woman's University	56.10	
The Art Institute of Austin	51.61	
The Art Institute of Colorado	48.39	
The Art Institute of Indianapolis	53.21	
The Art Institute of Portland	50.50	
The Art Institute of Tucson	48.83	
The Art Institute of Washington-Dulles	51.61	

The Art Institutes International-Minnesota	51.43		
The Art Institutes of York-PA	52.68		
The College of Idaho	56.90		
The College of New Rochelle	55.62		
The Master's College and Seminary	52.27		
The New School	51.32	570.00	
The Sage Colleges	55.49	580.00	580.00
The University of Tampa	51.42		
The University of Tennessee-Chattanooga	52.53		
The University of Texas at Arlington	55.69		
The University of Texas at Dallas	52.05		588.75
Touro College	56.47		
Trine University	53.32		
Trinity Baptist College	54.00		
Trinity Washington University	52.63		
Truman State University		570.00	
University at Buffalo	54.11		
University of Alaska Southeast	54.20		
University of Arkansas	56.09		
University of Arkansas-Fort Smith	54.53		
University of Bridgeport	56.45		
University of Central Arkansas	51.74		
University of Charleston	56.01		
University of Connecticut-Avery Point	56.99		
University of Connecticut-Tri-Campus	52.41		
University of Dallas		580.00	
University of Dayton	55.20		
University of Detroit Mercy	53.35		
University of Georgia	55.06		580.00
University of Hawaii at Hilo	55.29		
University of Houston	56.20		
University of Maryland Eastern Shore	52.70		
University of Maryland-Baltimore County	57.57		580.00
University of Massachusetts-Boston	55.06		
University of Michigan-Flint			595.00
University of Minnesota-Morris		570.00	
University of Minnesota-Rochester	51.47		
University of Missouri-Kansas City	53.69		
University of Missouri-St Louis	49.99		
University of Mobile	54.18		
University of Mount Olive	52.29		
University of New Haven	46.81		
University of New Orleans	54.57		
University of North Carolina at Pembroke	55.46		
University of North Carolina Wilmington	54.60		
University of North Florida	50.06		
University of Pittsburgh-Bradford	49.69		

University of Pittsburgh-Pittsburgh Campus	53.53	570.00	591.43
University of Puget Sound	52.63	572.27	580.00
University of Saint Francis-Fort Wayne	52.13		
University of Saint Joseph	48.23		
University of Sioux Falls	55.55		
University of South Carolina-Aiken	51.98		
University of South Carolina-Upstate	54.04		
University of the Sciences	54.38		592.50
University of Washington-Seattle Campus			580.00
University of West Georgia	54.14		
University of Wisconsin-La Crosse	57.56		
Upper Iowa University	55.74		
Virginia Military Institute	51.54		
Virginia Polytechnic Institute and State University			580.00
Wabash College	50.73		
Waldorf College	52.19		
Walla Walla University	55.15		
Washburn University	56.92		
Washington College	56.57		
Webster University	56.35	572.50	600.00
Wesleyan College	53.49		
West Coast University-Los Angeles	56.46		
West Virginia State University	53.10		
West Virginia University Institute of Technology	48.79		
Western Connecticut State University	54.93		
Western Oregon University	49.51		
Westfield State University	55.77		
Westminster College	56.65		
Westmont College		575.00	580.00
Westwood College-Annandale	56.53		
Westwood College-Arlington Ballston	54.44		
Westwood College-Ft Worth	50.00		
Westwood College-South Bay	53.09		
Whitworth University	51.30		
William Jewell College	53.19		
William Penn University	54.02		
WILLIAM TYNDALE COLLEGE	55.24		
Wingate University	52.41		
Winston-Salem State University	55.68		
Wofford College	57.52	570.00	585.00
Worcester State University	54.21		
Yeshiva Shaar Hatorah	52.03		
Yeshiva University		580.00	585.00
York College	56.67		
York College Pennsylvania	52.18		
Young Harris College	51.84		

APPENDIX C

VARIABLE CONSTRUCTION

Before the IPEDS published the GASB 34/35 and FASB, every college reported financial data using the same reporting form (fiscal years 1987 to 1996). Appropriations (state and federal) were separated from grants and contacts (state and federal) and every college reported total current funds revenues. The GASB 34/35 survey included fiscal data for all public colleges during the study years. For private, not-for-profit colleges I supplemented the FASB data with the six years of financial data from the common reporting form used for fiscal years 1996 to 1987. Similarly, I obtained six years of financial data for for-profit colleges and universities from this common reporting form.

For public and private, not-for-profit colleges, the GASB and FASB survey collects separate costs for instruction, academic support services and student support services for all fiscal years in the study. IPEDS allows for-profit colleges to aggregate academic, institutional, and student support services for fiscal years 2000-2013. Since for-profit colleges aggregate academic and student support services experiences, I aggregated the expenses for all colleges reporting financial data.

The reporting of total expenses varied based upon the control of the university and fiscal year. For fiscal years 2002-2013, public colleges reported total expenses deductions – current year total using the GASB 34/35. From fiscal year 1989 to 2002, public colleges reported total current funds expenditures and transactions. From fiscal year 1997 to 2013, private, not-for-profit colleges reported total expenses – total amount using the FASB survey. For-profit colleges reported total expenses for fiscal years 2000 to 2013. To obtain total expenses from 1990-1996 for private, not-for-profit colleges, I used total current funds and expenditures and trans reported to IPEDS. I used the same

IPEDS variable (i.e. total current funds and expenditures and trans) to provide total expenses for for-profit colleges from 1989 to 1999.

To estimate tuition, I used a combination of IPEDs variables. For tuition costs from 1999 to 2012, I selected in-state average tuition for full-time undergraduate students. For tuition costs from 1990 to 1998, I used the IPEDS variable called tuition and fees, full-time undergraduate, in-state.

APPENDIX D

CORRELATIONAL COEFFICIENTS FOR MULTICOLLINEARITY

Table 9

Correlational Coefficients for Independent Variables within College Enrollment Regression Model

Correlation between Independent Variables - Enrollment							
	Revenues	Federal	State	Tuition	Expenses	Instruction	Academic & Student Support
Revenues							
Federal	0.83						
State	0.6	0.72					
Tuition	0.06	-0.21	-0.56				
Expenses	0.98	0.85	0.63	0.03			
Instruction	0.98	0.82	0.62	0.04	0.96		
Academic & Student Support	0.95	0.78	0.57	0.09	0.95	0.95	
Public	0.27	0.42	0.74	-0.73	0.3	0.3	0.25
Private	-0.24	-0.39	-0.7	0.71	-0.28	-0.28	-0.24
For-Profit	-0.08	-0.04	-0.06	-0.01	-0.09	-0.09	-0.08

Table 10

Correlational Coefficients for Independent Variables Included in the Degree Completion Regression Model

Correlation between Independent Variables - Completion							
	Revenues	Federal	State	Tuition	Expenses	Instruction	Academic & Student Support
Revenues							
Federal	0.85						
State	0.6	0.72					
Tuition	0.05	-0.22	-0.56				
Expenses	0.99	0.86	0.63	0.02			
Instruction	0.97	0.82	0.61	0.04	0.98		
Academic & Student Support	0.95	0.78	0.56	0.09	0.95	0.95	
Public	0.27	0.43	0.73	-0.72	0.3	0.29	0.25
Private	-0.24	-0.4	-0.7	0.71	-0.28	-0.27	-0.19
For-Profit	-0.08	-0.04	-0.07	-0.01	-0.08	-0.01	-0.09