2024

Impacts of State Needs-Based Aid on Residency (In-State) Enrollments

Scott Pohlson

IMPACTS OF STATE NEEDS-BASED AID ON RESIDENCY (IN-STATE) ENROLLMENTS

By

Scott William Pohlson

B.A., Coe College, 2002
M.B.A., Creighton University, 2007

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

Department of Political Science

Political Science Program
In the Graduate School
The University of South Dakota
May 2024

Committee Signature Page

The members of the Committee appointed to examine
the Dissertation of Scott William Pohlson
find it satisfactory and recommend that it be accepted.

DocuSigned by:
Ed Garrish
82E372E94701430...
Chairperson

DocuSigned by:
Matthew R. Fairholm
4D9BB6AEBBAE412...

DocuSigned by:
Shane Nordyke
3402889F1DC846A...

DocuSigned by:
Karen Card
D766CF1D5F9F436...

Abstract

The debate over the effectiveness of various methods of financial aid dates to the 1960s with continued uncertainty on the impacts it has on college enrollment (Hansen 1983). Previous studies noted that states are adopting various financial aid programs with some focused on the merit-based aid program which traditionally has benefited higher-academic achieving students who come from higher income families (McLendon, Tandberg, & Hillman 2014). Then there are other states that have focused more on increasing their state funding on lower-income families via needs-based aid programs (McLendon, Tandberg, & Hillman 2014). However, these studies have not focused on the relationship of needs-based aid and the stay rate or recent public high school graduates staying in one of their home state institutions. This study used the Integrated Postsecondary Education Data System (IPEDS) which is collected by the National Center for Education Statistics (NCES) for each of the 50 United States from 2000 to 2020 to estimate the effects of state needs-based aid programs on both the college continuation rate and stay rates of recent public high school graduates. Using a multivariate regression analysis provided evidence that states which invest in needs-based aid programs had a positive impact on both the college continuation rate of recent public high school graduates and recent public high school graduates who elected to stay in one of their in-state college or universities.

Dissertation Advisor: DocuSigned by: Ed Gerrish 82E372E94701430... Dr. Ed Gerrish

Table of Contents

List of Tables

Chapter One: Introduction

A fundamental piece of the debate over the effectiveness of financial aid, which dates back to the 1960s, is whether need-based aid can be effective in retaining more in-state (resident) high school students from leaving the state to attend college (Hanson 1983, Ness 2010, Doyle 2006, Heller 2002, Cornwell, Mustard, & Sridhar 2006, and Cooke & Boyle 2011). The amount of money or financial aid package is one of the top factors or influencers on the type of college that students attend (Perna and Titus 2004). There are three types of financial aid in a financial aid package; federal, state, and private funding. The federal funding is allocated to a student no matter what college the student attends, whereas the state funding is typically reserved for those students who are attending an in-state college or university. Private funding can be institutional or external to the institution from organizations like dollars for scholars as an example. Because state funding can vary across the country compared to federal funding my research focused on the relationship that funding has on enrollment rates of resident students. State and local policy makers had a vested interest in understanding the relationship that state-based aid can have on the likelihood that high school graduates will stay and attend college in their home state institutions. In addition to filling seats and beds in their own state institutions, state and local policy makers also know that growing their resident enrollments can lead to improving future workforce demands for their state (Ness 2010, Doyle 2006, Heller 2002, Cornwell, Mustard, & Sridhar 2006, and Cooke & Boyle 2011, Winters 2016). My research explored how state need-based aid programs impact resident enrollments or those high school students that enrollment in one of their home public state institutions. Implementing and assessing the effectiveness of need-based funding has long been the

responsibility of the states, however in the last twenty-five years how that funding has been developed came less from the federal government, most-notably limited expansions or funding in needs-based funding like that of the Pell grant, as they have transferred the growing needs as the responsibility of state government in what is being called the "new federalism" (Peterson, 1995). These shifts in the growing responsibility to states have forced higher education to compete for limited dollars with those of other state programs like rising high school graduation standards (Conklin & Curran, 2005). This new competitive landscape has forced state legislators to increase scrutiny on how their limited funding will be allocated. In order to continue to see support for financial aid programs, all state funded programs need to prove that the funding is achieving the goals that state legislators have assigned to these various programs. While there are ongoing changes or shifts in the funding and landscape of higher education, the key to understanding these shifts comes down to what is the value of a college degree both from an economic and social benefit perspective. There is also a growing trend to pull in the private sectors including both the non-profit and for-profit given that these sectors are finding it more and more difficult to attract and retain students along with competing for the same federal funding as public non-profit institutions (Bok 2003, Suspitsyna 2012). Before policymakers support current funding levels for higher education or even expand funding, they must first share a defined goal or outcome on the funding that historically was focused on educating students for lives of leadership in public service which would advance knowledge through research (American Council on Education 1949). However, today's universities and the policymakers that aim to support them are more focused on preparing or developing students with the knowledge, skills, and ethically responsibility to meet current and future workforce

needs of society that will position graduates to be competitive in a global economy (Spellings Commission 2006). This change is massive in terms of how it expands the scope of what higher education funding is trying to address at both the federal and state levels. What this means for state policymakers is that they must view the support they provide higher education as both economic and social. From an economic standpoint, state policy makers desire economic measures like enhancing college access or affordability through their funding, but they also want to see social impacts like enhancing graduates ability to think logically and challenge the status quo so as to be competitive in a ever-changing and highly competitive global labor market (Brennan, Durazii, & Sene 2013; Selingo 2016, Tilak 2008, and Washburn 2005).

The economic goals that policy makers must confront relating to access to a better life or what is today known as affordability are not new to the value of higher education, but these came from the War on Poverty in 1964 (Hansen, 1983). To combat poverty, the federal government got into the "human investment" game back in 1964 (Hansen, 1983). However, this human investment is complicated as there are multiple factors at play both for the educational providers, policy makers, and the students looking to attend certain colleges or universities. These decision factors or measures come from both the economic and social benefits such as; knowledge, core competences, skills, capabilities, and dispositions which completing a college degree will provide (Chan 2016). Each of these factors are important to understand when measuring the relationship which state funding has with student enrollment at institutions of higher education. These complicated factors have led to a major debate in higher education funding on whether states would see increases in resident enrollment from merit-based aid programs or if need-based aid programs have more impact on resident enrollment (Heller 2002,

McBain 2011). The merit-based aid funding model is based on a student's academic achievement in high school along with how well they have done on a standardized test (ACT or SAT). Proponents of merit-based aid believe that awarding a college scholarship based on a student's academic work in high school will motivate students from all backgrounds to work hard in high school. However, the opponents of merit-based aid see this funding model as benefiting the elite class of society and adding an access barrier for high school students from disadvantaged backgrounds (Tierney & Vengas 2009). For need-based aid, the funding is based on a student/household's EFC (Estimated Family Contribution) from the FAFSA (Free Application for Federal Student Aid) or institutional need-based forms. No matter which side of this debate states choose to invest in, the goal remains the same which is to determine whether merit-based aid or need-based is the better investment.

Statement of Problem

It is difficult to measure whether merit-based aid or need-based aid programs are good investments if the goal is vague, such as giving individuals a better future and reducing the barriers to accessing an affordable education. Having measurable outcomes like growth in enrollments or growth in enrollments from low-income families would assist state legislators in seeing which side of the debate is going to meet their states desired goals. This is an important consideration to any research project as the immediate college enrollment rate for high school completers has grown from 60% in 1960 to 68% in 2010 however that rate has declined since 2010 to 62% in the fall of 2021 (NCES 2023). Each of these increases and decreases are significantly different by race and ethnicity which also has correlations with family incomes. The immediate enrolled in college rate for males is 55% compared to females which are at 70%

(NCES 2023). The immediate enrollment rates for underrepresented populations are lower than the white or majority of students. For the white students their immediate enrollment rates have stayed around the 70% to 65% rate from 2010 to 2021 (NCES 2023). The underrepresented population ranges from 66 to 55 or significant higher declines from 2010 to 2021 (NCES 2023). These statistics reinforce that immediate college going rates continue to be a measurement which state legislators need to focus on better understanding if the goals of their policy implementation involve either merit-based or need-based program.

Another area of consideration for state legislators is even if they saw more enrollment, would that enrollment come from resident or in-state enrollments in which merit-based or need-based programs benefitted or would it influence more out-of-state students to attend their public institutions. Legislators are elected by residents of their state and the debate continues the value of both international and non-resident domestic enrollments. More research is needed on the relationship between merit-based aid and need-based aid with respect to their impacts on both enrollment migration and employment rates for states post the great recession. It is striking how research has shown merit-based aid to favor those already attending colleges, but little attention has been paid to whether or not need-based aid can maintain this migration impact yet also increase the access issue for those not meeting merit-based eligibility requirements (Heller 2002). There remains an unanswered question or gap in understanding for state legislators that my research is designed to answer. The research question of whether need-based aid has a positive relationship (increase) on the resident enrollment rates of students who graduate from high schools within their state. In addition to this question, there is also the need to understand if investments in needs-based aid result in a

positive relationship on retaining in-state graduates from public high school to stay in their home state for college. Each of these questions or issues is what is missing in the data and that my research helps to better understand.

My research explored the history and development of the United States Higher Education system via key events that impacted the structure and functionality of this complex system. Each of these events contributed to enrollment in the US higher education system and needed to be understood before running an analysis on the relationship of needs-based aid on resident enrollments at 4-year public institutions in the US Higher Education system. Then my analysis narrowed in on how some of the largest federal financial aid programs work along with how eligibility was determined for the primary purpose of understanding the relationships which these programs have on college enrollment rates. Included in this review of the effectiveness of these large programs is the importance of program design specifically focused on merit-based aid versus needs-based aid. Understanding the history of these kind of programs guided the design of this research and explored the gap in understanding the relationship of state needs-based aid programs to traditional resident high school graduates. Based on these findings my research concluded with noting the remaining gaps in knowledge which need more research to help explain the effectiveness of public policy investments in financial aid that can impact enrollment in the US Higher Education system.

Purpose

The purpose of my research was to examine the relationship between state needs-based aid programs and the relationship that needs-based aid has with resident enrollment rates at in-state public colleges or universities which is noted as the stay-rate at public 4-year

institutions in the United States. The results of my research added to the literature on the relationship between state financial aid policies and higher education by considering the potential effects states could expect when considering funding state needs-based financial aid programs over a ten-year period. The results of my research can be used to inform current and future stakeholders on the effects of public 4-year university enrollments when funding needs-based aid programs for their state.

Chapter Two: Literature Review

Understanding the evolving discourse around higher education funding as a burgeoning public policy issue necessitates a comprehensive grasp of its organization and design within the United States (US). While today there are various types of institutions from private and public to for-profit and non-profits including institutions that have a two-year focus to those who are designed to serve students for four-years. In addition to these types of institutions there are also technical institutions or specialty schools focused on career certifications. The increasing variation in the types of institutions can be attributed to the demand for a growing and changing economy, but this variety of offerings was not how our system of higher education started in the United States (US). As my research continued to analyze the relationship of needs-based aid on enrollments in higher education, it was important to understand how both the structure and funding of higher education has developed over time.

Significant Events Impacting the Structure of the US Higher Education System

The structure of both funding and design of higher education is best understood by looking at the historical developments for the United States higher education system from its

beginning and the influences of the English structure to key events that lead to drastic growths in students attending college in the United States. In addition to these key events one can also see important legislative or funding allocation that helped to increase access to higher education. Both the structure or organization and then the funding efforts help shape the discussion for how needs-based aid and merit-based aid impacts enrollments in the United States Higher Education system.

English Model vs US Model of Higher Education

In order to understand various educational systems, it starts with governmental oversight or management of the entire education system. The US Higher Education system isn't unique and follows the English model where the oversight is organized under a federal agency named the Department of Education which was created in 1867 to collect information on schools and teach that could help the states establish effective school systems. However, it wasn't until 1890 with the passage of the Second Morrill Act, that gave the responsibility for administering support for the original land grant college and universities to the Department of Education which at the time was named the Office of Education (Department of Education 2023). Since 1890 the Department of Education has been responsible for the oversight and development of the Higher Education System in close partnership with the states. Although giving authority to the Department of Education in 1890 is skipping ahead in the history of US Higher Education. The US Higher Education system started as a group of private, independent universities established before the founding of the US republic (Thelin 2011). These private universities are familiar names even today like Harvard and Dartmouth, yet they were chartered during a time when the United States was an English colony. For this reason, these

original universities were modeled after the English higher education model where there were multiple colleges under one degree-granting entity (Thelin 2011). This governance structure continues today and can still be seen where students can select from many different majors and degrees housed within a college or a variety of colleges and schools if a student is in a larger public or private university. These various majors and degrees can be in areas like business, arts and sciences, engineering, fine arts, education, and health sciences just to name a few. Even though the US Higher Education system has a common governance structure to that of its founding in the English Higher Education system, the two systems differ in federal or national governance (Thelin 2011). Those differences between the English Higher Education system and that of the US Higher Education system follow the changes or vision of the founding of the United States republic in the role of governance. The founding of the United States moved governance from a centralized monarchial governance structure to one of decentralized or constitution-based governance shared between national (federal) and local (state) governments. This new republic set the foundational structure in how the US Higher education system differs from that of the English Higher Education system. In the English system of higher education there are ministries of higher education that manage goals, quality, and funding at the national level whereas in the United States there is no national education governance (Thelin 2011). In the United States each state charters its own universities and thus allocates funding through its state legislature (Thelin 2011). This difference in governance structure helps to explain a key difference in how US Higher Education has expanded from its original selective private institution model like Harvard University which was established by the King of England

to its current day total of 4,360 institutions consisting of four-year, two-year, public, private, technical, and community colleges (NCES 2021).

While the changes in governance structure are the foundational explanation for why the US Higher Education system differs from that of its English counterpart, there were other events under the new US republic that help to explain why the US Higher Education systems looks the way that it does today both in governance and funding. My research explored six major historical events which helped to shape the US Higher Education system since the republic was established and how these events help in understanding why some states have had needs-based funding and others have not. Each of these historical events drive changes in enrollment rates which help to support the significant changes which each of these events triggered in enrollment growth. For context and comparison, the US Higher Education system had only forty-nine institutions from 1638 to 1819 and of those forty-nine, forty were private (Goldin and Katz 1999). These predominately private institutions are due in large part to the influence of the English model on the early years of the United States. Each of these events contribute in how US Higher Education would mirror the growth of more students going to college and how education aligned with the newly found freedoms of the United States and its focus on equity, liberty, and freedom for all not just those of elite or secular status.

1819 Supreme Court case Trustees of Dartmouth College versus Woodward

The first of those major events is the 1819 Supreme Court case Trustees of Dartmouth College versus Woodward where private colleges found their support in the US during the 19th century. During the years of 1820 to 1859, 240 new institutions were established in the United States and 225 were private institutions (Goldin and Katz 1999). Fundamental to this case is the

freedom that the new republic was founded upon yet still working through the divide between a federalist versus a republican society or what kind of organization and oversight is best suited to not return to the secular control of the English way of life. This supreme court case would be the deciding factor in how higher education would fit into the debate over federalist versus anti-federalists or at the time federalist vs republican. So, while this case is largely known for its constitutional law influence on private rights and corporation privileges, it also was foundational to why there is both a private and public higher education system in the United States (Johnson 1983). This case not only set the course for securing private colleges the freedom to define their own educational ideological without state interference, but it also carved out a space or need for a public alternative to private higher education based on the court's ruling in favor of Dartmouth College (Trustees of Dartmouth College vs Woodard 1819).

This Supreme Court case centered around a charter that was originally given to Eleazar Wheelock by the English Crown in 1769 (Trustees of Dartmouth College vs Woodard 1819). This charter granted authority to a board of trustees which was created by Mr. Wheelock. In 1779 John Wheelock succeeded his father as president of the college. John was fired by the trustees in 1816 because of his differing ideology views and autocratic style on how the college should be run. Later in that same year New Hampshire legislators amended Dartmouth College's, new name Dartmouth University, charter and attempted to convert the school into a secular institution which would be more aligned with their ideological or party's objectives (Johnson 1983). This new amended charter created a new board of elected trustees who then appointed Wheelock president. Meanwhile, the original board of trustees was continuing to operate Dartmouth College and hired Daniel Webster an alumnus of the college to represent them in

suing William Woodward who was the secretary and treasurer of the college. Woodward had recently left Dartmouth College to join the new Dartmouth University and when he left, he took with him the college's charter, records, and seal (Trustees of Dartmouth College vs Woodard 1819). It was at this point that the original trustees sued Woodward on the grounds that he violated vested rights, the state constitution, and the United States Constitution's contract clause (Trustees of Dartmouth College vs Woodard 1819). In the state court system Woodward won and the state court declared the college a public corporation and subject to state legislation. However, this is not how the U.S Supreme Court saw the case and sided with Dartmouth five to one. Chief Justice John Marshall noted that Eleazer Wheelock had created "an artificial being, invisible, intangible, and existing only in contemplation of the law." (Trustees of Dartmouth College vs Woodard 1819). This creation according to the majority opinion of the US Supreme Court made Dartmouth College a private entity and thus entitled John Wheelock to succeed his father Eleazer Wheelock, but it also meant that if the original board voted to remove John Wheelock it could do so. Additionally, this meant that any support of an original mission that might change with leadership or board makeup is not subject to state government oversight as it is private (Johnson 1983). This decision by the US Supreme Court in favor of Dartmouth College not only sparked a major growth in private colleges in the early 1800s, but it also launched the need for an alternative to private colleges which would eventually be the modern-day public university.

Public Universities found their niche in higher education when the seventh governor of New Hampshire, which is the state that Dartmouth resides in, William Plummer was elected through a political battle that had Dartmouth versus Woodward Supreme Court case at center

stage (Johnson 1983). Plumer valued the role of the private college and supported the freedom that was needed from the public funds, but he also felt that private colleges were focused on training young men for priesthood with strong religious ties (Johnson 1983). Plumer thought that a missing need in society was an education free from religious influence and focused more on education designed for the pursuits of a career in business (Johnson 1983). For Plumer the time had come to focus the public funding of universities on the "useful education" in areas of education not seen before like; "principles and sciences of agriculture, of commerce, of manufactures, and of mechanics" (Cincinnatus 1821). There was similar support of this new kind of public university from Johnathan Baldwin Turner and Justin Morrill forty years later when the land grant colleges are introduced to the US higher education (Johnson 1983). What Plumer was arguing for was a reform in higher education that was well ahead of his time, but important to the history the US Higher Education system. Plumer felt that the current private college model with its focus on secular ideals was important, but appeared to be more for the "rich and idle" and what Plumer wanted to see was a public investment in a university for the "common people" and the "common affairs of life" which would benefit a new republic (Johnson 1983).

While New Hampshire is not the entire history of how higher education in the United States came to be, it is an important event in the history of how the higher education system is designed in the United States. When the justices supported the position that a charter for a college is of a private manner and should not be interfered with from the public interest, it sent a clear message that the federal government wasn't going to stop states from chartering colleges focused on the ideals of their choosing. However, it also got public actors starting to

think about alternatives to the primarily religious focus of the private colleges which states could charter as well as public goods. Thus, why there is such a significant increase in the college and university developments throughout the 1800s. My analysis explores the impacts of funding for needs-based aid programs and how this funding impacts resident enrollment, there needs to be a better understanding of what other variables or trends in society might help explain the true impacts of changes in the higher education landscape. This supreme court decision also shows a clear shift to a market-based approach to college and university developments which was a stark contrast to the English model of centralization (Johnson 1983). Under this market-based approach, universities could develop based on the needs of the various communities and industries with new majors beyond the liberal arts into areas like; engineering, science, law, and medicine (Johnson 1983).

The Dartmouth versus Woodward decision was not the only major event in the history or development of the US higher education system, but it certainly established the space for both private and public institutions of education. However, the choice or ability to have separation from the state was an advantage based on an ideology or the freedom to drive a mission that didn't align with the public policy, but that also meant that funding would need to come without the state's assistance. Even in the financial case of states who wanted to start universities like that of New Hampshire, it also meant that they would need to fund it themselves as the federal government wasn't involved given the decision of the Dartmouth versus Woodward case.

The First Morrill Act of 1862

This leads to another major event that has influenced how higher education in the United States is structured which was the signing of the first Morrill Act. The next forty years from the Dartmouth versus Woodward decision to the first and second Morrill Acts or from 1860 to 1899 represented the greatest growth in the number of new institutions in the US Higher Education system when 432 new institutions are founded with 348 of them being private (Goldin and Katz 1999). The signing of the first Morrill Act of 1862 by President Abraham Lincoln was named after Vermont Congressman Justin Morrill, who lead the passage of the legislation (Allen & Jewell, 2022; Brown, Donahoo, & Bertrand, 2001; Redd, 1998, R. Wilson, 1990). The purpose of this act was designed to help develop alternatives in higher education to the elite private schools like; Dartmouth, Columbia, Yale, and Harvard which emphasized the English model or a focus on the liberal arts, classics, and religious denominational ideology (McDowell 2002). So, while the Dartmouth versus Woodward supreme court case established both the private and public higher education structure in the United State, the first Morrill Act provide the legal ability for the states to fund and thus establish higher education institutions on their public land. The goal of the Morrill Act of 1862 was to equalize higher education or expand it beyond that of the elite privates focused on liberal arts, but not to leave the private elite college entirely (Billings 2012). This new system of land grant colleges would mark the beginning of public institutions focused on educating the industrial class which today is a system of comprehensive colleges and universities with centers for research, teaching, agricultural innovation and the liberal arts (Lee Jr., 2013). The Act created what are now known as land grant institutions in higher education (Morrill 1862): “the endowment, support, and maintenance of at least one college where the leading object shall be, without excluding other

scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts." States were now allowed to profit from the sale of land, if that land was used for creating land grant institutions which focused on establishing programs in areas like; agricultural, engineering, mechanical, and military sciences. The funding or sale of land was dependent upon how many senators and representatives there were in each state as of the census of 1860 (Morrill Act 1862). Each senator and representative brought a value of thirty thousand acres with the sale value required to be invested in secured bonds (Morrill Act 1862). The purpose of those funds was establishing an endowment which would be important to sustaining maintenance and repairs along with the general operations of the institution (Morrill Act 1862). If these original funds were to be depleted or lost then the state had to replace it which as noted in Morrill 1862 ensured, "the capital of the fund shall remain forever unchanged." The first state legislature to follow through on the Morrill Act was Iowa in 1862 with all fifty states eventually establishing land grant institutions (Billings 2012).

Second Morrill Act of 1890

While the first Morrill Act of 1862 focused on expanding education beyond the elite private model of the English education or focused on liberal arts education which was a major concern during this time, the second Morrill Act followed another public policy issue at the time which was the growing concern over race equality in the United States (Billings 2012). The focus of the second Morrill Act in 1890 was to establish what is known today as the historically black colleges and universities primarily located at the time in confederate states (Goldin and Katz 1999). Prior to the second Morrill Act of 1890 the United States had more than 200 Historically Black colleges and universities (HBCU) (Brown & Davis 2001). However, these HBCUs were

funded through philanthropic associations, churches, local communities, missionaries, and other private donors (Brown and Davis 2001). It wasn't until the end of the United States' Civil War in 1865 that the public funding side of the house came about for HBCUs and specifically state government participation. States were now required to expand the resources required to support institutions of the first Morrill Act of 1862 to now include institutions that were enrolling African Americans (Brown and Davis 2001). Instead of expanding access with their current institutions in Southern states through admitting more African Americans, thus meeting the Morrill Act of 1890 mandate, these states maintained their segregated views for higher education by establishing what is now known as "1890 schools" (Brown and Davis 2001).

While the second Morrill Act of 1890 clearly expanded and contributed to growth in higher education for African Americans, it needed other key historical events to be included as a major event in the historical developments of higher education in the United States. It should be noted that this is clearly different from that of the first Morrill Act of 1862 which quickly lead to a massive expansion of higher education institutions. These additional key events that were needed for the second Morrill Act of 1890 demonstrate the division that was in the United States during and after the Civil War. The federal government was needed for the first of the additional key events for the second Morrill Act of 1890 which was that Southern states were required by law to respond to the Thirteenth, Fourteenth, and Fifteenth Amendments. The three Constitutional Amendments mandated that these Southern States provide public education for the former slaves and other Black Americans. In addition to these Constitutional Amendments, HBCUs also needed other federal legislation like the Emancipation Proclamation and Freedmen's Bureau to develop. The Emancipation Proclamation came in 1863, granting

freedom to slaves in confederate states, pre-dates the Morrill Act of 1890, but was needed to bring about the ability for HBCUs to be supported with public funding. Then in 1865 Congress passed the Thirteenth Amendment prohibiting slavery in the United States and later in that same year Congress approved the Freedmen's Bureau. The Freedmen's Bureau provided funding to support the establishment and maintenance of Black "day schools, night schools, industrial schools, institutes and colleges (Bennett 1984). Then in 1866 Congress passed the Fourteenth Amendment which declared the equality of all Americans without regard to race. In 1867 Congress passed legislation creating Howard Normal and Theological Institution for the Education of Teachers and Preachers known today at Howard University (Brown and Davis 2001). Two years later in 1869 Congress passed the Fifteenth Amendment which prohibited the right to vote based on race. Each of these key events established critical support for the development of the Morrill Act of 1890. From this point on there were nineteen new HBCUs that were established which in the historical context isn't a major addition, it did play a pivotal role in how states would receive funding for public colleges and universities.

Expanding Academic Offerings- Research Universities

Another major event in the development of the US Higher Education System was at the turn of the 20th century running from around 1890 to 1940 when significant growth was occurring in the higher education system. This was not a time of major growth in new colleges or universities as noted above as there were only about 200 new institutions that were opened. It is during this time that the development or expansion of academic offerings which provides another important variable in understanding the relationships of needs-based aid on residency enrollments. Another way of looking at this important event is that enrollment growth can also

be measured in terms of expanding access to the citizens it is meant to serve. It was during this time period that change in the scope of higher education was being developed with the introduction or establishment of research universities (Goldin and Katz 1999). The early events or history of the United States higher education up until the 19th century could be described as learning institutions in the mission and purpose. That is not what begins to occur in the first quarter or third of years for the 20th century where research universities begin to emerge in the United State higher education landscape (Veysey 1965). This change in scope for the United States with adding research universities wasn't innovative or a new idea as universities existed in Europe, but who they served, or the purpose varied by country. In Britain the focus was on classical studies, France was focused on training French grand ecoles, and in Germany there were graduate and research universities (Goldin and Katz 1999). Those European universities and their focus were pulled from for the United States research universities, but what made the United States different is it was to serve a broader set of students and for that matter the needs of the state. So instead of being narrowly focused the idea of these modern research institutions was to be designed like a department store where it could serve by providing the classic disciplines, but also grow with society to drive it forward with the introduction of professional subjects like; law, medicine, dentistry, pharmacy, theology, and business (Goldin and Katz 1999). The goal was to expand and grow the education of its citizens by leveraging the advances in one areas research with that of the teaching and research in other areas of the university. This helps in shaping our understanding of how expanding funding to these universities could receive public support as the modern university was not focused on just the elites, but more so on expanding its offerings to that of the general public. Although while the

goal was to expand access to the general citizenry it is important to note that at this point in the history of US Higher Education funding one's education relies solely on the individual or family to pay for this modern university offerings without a lot of help from the federal or state governments.

The modern university and its modern version of being more public than private also gets its roots during this period from 1890 to 1940. It is during this time of development for the modern university which the public sector has 43% of the total share of universities although only 13% of the total share of higher education institutions in the United States (Goldin and Katz 1999). The growth and expansion in the scope of the modern research university became a significant advantage compared to its competitor in the United States which was the private college as growth in enrollment in these modern universities went from 42% in 1897 to 59% in 1934 (Goldin and Katz 1999). Society was also experiencing a major shift during this time in terms of knowledge and education from the traditional "rule of thumb" or common-sense way of doing things to the scientific method approach. This shift also shows up in other areas of influence on how society is shifting in public policy and public administration theory with the introduction of Fredrick Taylor's "Scientific Management" theory (Taylor 1911). Taylor is focused on finding the basic principles of how time and motion are involved in the performance of physical tasks and then determining the one best way to accomplish tasks and manage workers (Taylor 1911). Most of what it studied was in the private business sector, but it received increased attention from the public sector during his time. Once one separates the corruption out of public administration it can be measured under scientific management (Taylor 1911). Corruption was not a major issue in higher education, but distrust in the science or

current common-sense practices in areas like business and medicine were impacting the public trust of higher education and for that matter the practice of business and medicine in society. In order to build this trust, the public sector of higher education was well positioned with its majority share of the modern public research universities to bestow trust for replacing in the medical schools the “art of healing” practice with medical education grounded in the scientific method (Goldin and Katz 1999). It is also during this time in which there is a growth in enrollment numbers at professional schools. This growth supports yet another major shift in higher education at the beginning of the 20th century from the private sector to the public sector. Prior to the start of 20th century, 48% of students training to be lawyers, dentist, pharmacists, and doctors where affiliated with independent or private colleges, fast-forward to 1934 which shows only 19% of these students are studying at independent or private colleges (Goldin and Katz 1999). This time period in the United States higher education system shows that not only was there a major shift in the scope of higher education or the development of the modern research university, but these major universities were also growing out of the public sector where trust in the scientific method was replacing the common sense model which was connected with the private or independent college and university sector. In today’s higher education or as of 2022 enrollment statistics, the public sector continues to lead the way with 66% or just over 12 million students studying in public two-year and four-year institutions (IPEDS 2022).

In addition to the growth of the public modern research university, there is also a significant growth of enrollment in US higher education due to population growth and participation rates in the first thirty years of the 20th century (U.S. Department of Commerce,

Bureau of the Census, Historical Statistics of the United States, NCES). During the first thirty years of the 20th century enrollment in higher education rose by 84% of the population defined as students 18 to 24-years-old. The ratio of enrolled college students to the total population of 18 to 24-year-olds rose from 2 to 7 per 100 (U.S. Department of Commerce, Bureau of the Census, Historical Statistics of the United States NCES). The 1930s presented new challenges to the college enrollment rate with the nation focused on overcoming a depression, but by the end of the decade college enrollment had reached 1.5 million with 9 college students per 100 18 to 24-year-olds attending college (U.S. Department of Commerce, Bureau of the Census, Historical Statistics of the United States, NCES). It is also at the end of the 1930s decade that more than half of all college students attending college at a public institution in the United States. Each of these data points are important to my research as they provide a better understanding of the relationship of needs-based aid to college enrollment rates. History in higher education enrollment rates shows us that accounting for the number of colleges, population rates of 18 to 24-year-olds, and major events like wars or economic events like depressions all impact higher education enrollment rates and should be accounted for when measuring what impacts enrollments in higher education.

Government Issued (GI) Bill of Rights

It is during the early 1940s where higher education sees another major event impacting its enrollment rates with the introduction of The Servicemen's Readjustment Act of 1944, better known as the GI (Government Issue) Bill of Rights (Levine & Levine 2011). This new act focused on rewarding the 12 million men and women who would soon be demobilized with the ending of World War II with full-tuition, stipends while in school, dependency allowances, and

low-interest mortgage loans (Serviceman's Readjustment Act, Public Law 346). The benefits included up to $500 in tuition and educational expenses paid to the institution along with either $65 per month stipend or $90 for individuals versus married veterans (Serviceman's Readjustment Act, Public Law 346). At the time these subsidies for educational expenses would cover the charges of tuition and books at Harvard and the monthly stipend covered about fifty to 70% of the opportunity cost of not working for veterans (Bound & Turner 2002). The purchasing power of these new veteran benefits for access to elite privates and thus easily covering the cost of all remaining public higher education options for veterans helps to explain why higher education enrollment was surging by the end of the 1940s. At the end of the 1940s or just 5 years into the GI benefit for veterans, nearly 2.4 million students enrolled in colleges which represented 15 per 100 18 to 24-year-olds (U.S. Department of Commerce, Bureau of the Census, Historical Statistics of the United States, NCES 2022). Comparing the 15 per 100 of 18 to 24-year-olds in 1949 to the 9 per 100 in 1939 demonstrates that college enrollment had nearly doubled in 10 years with the last 5 years of the decade representing the largest growth. The impact of the GI Bill's educational benefits on higher education enrollment rates is clearly a major event in the history of higher education and demonstrates that public funding that targets a specific audience can significantly change the landscape of higher education. The significance of the GI Bill's education benefits can be clearly seen in the enrollment figures. Prior to the GI Bills' education benefits or before World War II 160,000 students were enrolled in college and by 1950 that number grew to over 500,000 with 50% of the students being veterans (Levine and Levine 2011). Veterans on the GI Bill would eventually grow to nearly 5.6 million who have attended college from vocational institutions to graduate and professional

institutions (Levine and Levine 2011). A 1990s study conducted by the Joint Economic Committee of Congress even studied the return on investment of the GI Bill for the tax payers noting that for those veterans who took the benefits, they saw an average gain of $10,000 to $15,000 annually when compared to those veterans who didn't use the GI Bill (Herbold 1994). These increases in salaries were estimated to generate an additional tax revenue that paid for the initial GI Bill by 8 to 10 times which has led some to refer to the GI Bill as "the best investment the U.S. government ever made" (Herbold 1994-1995). Measuring the return on investment to the tax payer for public investments like the GI Bill is important when one thinks of both the increased tax base that comes from higher earnings which has been shown to occur from college graduates. It also can show positive returns for meeting the needs of the workforce demands while also supporting that government or public funding, like the GI Bill, can be a good investment both for economic and social benefits to society.

The establishment of the GI Bill and federal programs to fund or support federal or societal concerns like the education of world war veterans was another example of how the needs of the United States have created events that shape the US Higher Education system and help us in understanding the impacts of policy and public funding like needs-based aid. While key events like the GI Bill can have positive impacts on areas like the federal tax revenue system, these federal public policies like GI Bill can have competing goals or priorities with those of state public policy priorities.

National Defense Education Act of 1958

While it is safe to conclude that the GI Bill had a significant impact on a surging higher education system, there is another significant event gaining the attention of higher education in

the 1950s which shifts the needs of the US to be competitive during the Cold War or compared to the Soviet Union with respect to education goals of its citizens. The 1950s for US Higher Education saw another large gain in enrollment with a 49% increase throughout the decade leading up to the 1960s driven by the growing percentage of 18 to 24-year-olds attending college (U.S. Department of Commerce, Bureau of the Census, Historical Statistics of the United States, NCES). Throughout the 1950s the percentage of 18 to 24-year-olds attending college grew from 15 per 100 in the 1940s to 24 per 100 in the 1950s (U.S. Department of Commerce, Bureau of the Census, Historical Statistics of the United States, NCES). This significant growth and shift to compete during the Cold War brought forth the need for the National Defense Education Act of 1958 which recognized that education should be a national unifying force, and that educating citizens should be the highest priority to compete on the global stage (Flemming 1960). The National Defense Act of 1958 was signed into Public Law by President Eisenhower on September 2nd (Public Law 85-864). The act authorized $1 billion in federal aid for a dozen separate program described in ten Titles (Public Law 85-864). Among its provisions, this new law offered grants, scholarships, and loans to students interested in majoring in education, engineering, foreign languages, math, and science (Public Law 85-864). However, the legislation wasn't an easy pass through in the legislative process as the last time such federal funding came was the Morrill Act of 1968 and the growing view at that time was that education should be something that the federal government does not get more involved with and leave it to the states (Kaiser 2006). Those concerns quickly dissolved, and support came from a combination of the concerns of the Sputnik Crisis where a study showed that the Soviet Union was training scientists and engineers at a rate of two to three times more per year than the

United States (Fine 1954). In addition to the Sputnik Crisis there were growing concerns over the 200,000 gifted students that were not able to continue with their educations after high school due to the affordability of college (Flemming 1960). This act was designed to follow the federal and anti-federalism priorities of the United States where the National Defense Educational Act's funding is targeted at specific programs with national or in this case global needs which exceed the state's capabilities of addressing independently. While the funding was targeted based on national needs, this act respects the sovereign right of the states to administer educational policies and the execution of their education system as they saw fit (Flemming 1960). This new act was to provide federal funding to the states in new ways from the previous key events like Morrill Acts or the GI Bill. The primary Titles of the Act were focused on three areas; aptitude testing to find gifted young people, liberal loan programs to help these gifted students enter and graduate from college, and finally to fund increased accessible education opportunities specifically to improve the quality of instruction in greater quantity and adequate facilities (Flemming 1960). While each of these Titles is important to understand in the context of how it has impacted higher education and specifically the goals of competing in a global economy, my analysis is focused on how Title II provided financial assistance to needy students, graduate or undergraduate. Title II begins the US's journey into federal loans, administered by participating institutions, to address access in education so that funding isn't the reason for worthy students to attain a college education. Each of the participating institutions had to contribute one dollar for every nine dollars of federal money (Flemming 1960). Those contributions or matching dollars would not come from each state's legislative body or institutions, but the institutions had to request authorization from their state

legislature (Flemming 1960). In the case of the state-funding institutions those funds would need to come from the current funding, or the state legislatures could allocate additional funding to help meet the federal match or funding requirements. Under Title II, students could borrow up to $5,000 over a five-year period, principal and interest had to be repaid over a ten-year timespan with the repayment period starting a year after graduation (Flemming 1960). The National Defense Education Act (NDEA) of 1958 was the foundation which continues to be the reality of today's higher education funding model where borrowing or using a federal loan for a college education is what most students use to finance their education. The issue at the time was that the NDEA was too narrow for all citizens to benefit from as it limited the funding to just a few majors or careers of interest for national security. This leads us to how federal student loans expanded to be available to all students no matter what major via the Higher Education Act of 1965. Determining the impacts of student loans on the growing enrollments of college bound students helps us in comparing these growths in 1960s to how similar growths or declines might be occurring when needs-based aid programs are introduced by states.

The Higher Education Act (HEA) of 1965

The HEA of 1965 was a major piece of President Lyndon Johnson's "Great Society" domestic program which focused on making higher education a necessity to citizens no matter their family background or what their career or major in college (Higher Education Act, 1965). Under this new program the federal government was going to establish itself as the primary financing agency for education financing. President Johnson's new vision for higher education financing was to design it like how families buy homes with the federal government backing the loans (Looney and Yannelis 2015). It is during the 1960s that higher education enrollment

growth sky rockets at a rate of 120% (U.S. Department of Commerce, Bureau of the Census, Historical Statistics of the United States, NCES). By the end of 1969, college enrollment rates by 18 to 24-year-olds was at a height of 35% which is 11% higher than the 1950s and 20%higher than it was at the end of 1949 (U.S. Department of Commerce, Bureau of the Census, Historical Statistics of the United States, NCES). To put those percentages into enrollment figures, there were 3.6 million college students in 1960 and by 1970 that figure grew to 7.5 million (NCES 2022). In addition to the expanding of eligibility for student loans for college, there was also a major change in how the funding would work with institutions. Under the NDEA of 1958 the federal government gave money to the colleges or institutions to lend to students, but under the HEA of 1965 those funds could now be taken out by students from private lenders (Higher Education Act, 1965). The government would also back these private lenders to encourage them to lend to all students with a guarantee based on market rates (Higher Education Act, 1965). This public-private partnership for student lending became known as the Federal Family Education Loan Program (FFELP) (Higher Education Act, 1965). The expansion of the federal student loan eligibility under the Higher Education Act of 1965 changes the course of how higher education is both accessed and financed for the United States and continues today with just over $1.7 trillion as of the first quarter of 2023 (Board of Governors of the Federal Reserve System (US) (2023).

The HEA of 1965 represented the start of the growing debate over the role of the federal government in funding post-secondary education. This debate grew as the pressure to compete on the global education developed during the Cold War as well as the United States seeing steady growth in the number of high school graduates in the 1960s and 1970s (NCES

2022). At the same time, the United States was also working to improve access from an equity perspective for the growing number of high school graduates. Equity was focused on designing a federal student loans system that would expand access for all high school graduates no matter their economic status. The decision for how the federal funding would be designed came down to five options for Congress to consider in providing direct aid to; institutions, states, students (and parents), research, and aid in the form of tax benefits to students (Mullin 2013). Direct aid to students ended up being the winner based on the views at the time that this approach would benefit the lower end of the economic spectrum as well as allow freedom to choose the level or type of institution for the student (Mullin 2013). This approach quickly gained political support as President Nixon noted in a special address to Congress in 1970 that, "equal educational opportunity, which has long been a goal, must now become a reality for every young person in the United States, whatever his circumstances" (Nixon 1970). This support from the President of the United States leads to the passage of the Education Amendment of 1972 which focused on promoting college access, affordability, and choice (Education Amendments Act of 1972). While the Educational Amendments Act of 1972 is best-known for establishing Title IX, this act also established the development of the Basic Educational Opportunity Grant (BEOG) which in 1980 would become known as the Pell Grant and is now the single largest source of federal grant or free aid supporting postsecondary education students (Education Amendments Act of 1972). Given the size of the Pell Grant program and knowing that it has been impacting college decisions since 1972 is important to our research on the relationship of needs-based aid to residency enrollment and college continuation rates. It is also important to know that the Pell Grant is the largest free funding or

federal aid that is different from the loan programs. Given that the Pell Grant is free aid it is the first example of federal assistance that is free and is an important event to study for the purposes of understanding how state needs-based aid can impact college enrollment. The Pell Grant or BEOG at the time was a quasi-entitlement program which first provided funding to college students in 1973 based on a formula that determined the financial need by the Office of the Education and was to be reviewed annually by Congress (Education Amendments Act of 1972). The two major federal programs for improving the competitiveness of the United States and equity in accessing higher education which came from the Higher Education Act of 1972 are the Pell Grant and the Guaranteed Student Loan (GSL) know today as the Federal Direct (subsidized, unsubsidized, and plus) Loans. As noted above, the Pell Grant continues to receive support today yet has increased in 2021 U.S. dollars from 6.5 billion in 1981 to 25.9 billion in 2021 with a peak expenditure of 44.3 billion in 2010 (NCES 2022). However, the increases in the federal expenditure doesn't consider the actual purchasing power of the Pell Grant today as compared to 1975. Research has found that 24% of public, four-year institutions and fewer than half of public, two-year institutions are affordable for the average Pell Grant recipient (NCAN 2023). In this same study it showed that in 1975 the value of the maximum Pell Grant compared to tuition, fees, room and board at public four-year institutions was 79% compared to 2023 which is only at 32% (NCAN 2023). This research shows that there is a growing gap with Pell Grant recipients which could be reducing the true impact of the program compared to 1975 even though today the federal government is contributing nearly 600% more in federal funding for the Pell Grant compared to 1975. Measuring the impact of the Pell Grant program on college enrollment has brought mixed results with a few studies noting that there have been

significant enrollment increases (Leslie and Brinkman 1975, Hauptman and McLaughlin 1987). The aggregate students of these research studies do not support that the Pell Grant has had a significant impact on the college enrollment rate, but there have been impacts to enrollment when looking at choice increases and lower economic student increases (Hanuskek 1989). If one defines the purpose of the Pell Grant as expanding choice and access to lower income families then there is support for a positive impact, or growing enrollment, of this grant program doing what it was originally intended to-do today. As of 2021, 97% of Pell Grant recipients have a total family income at or below $60,000 (CRS Pell Grant End-of-Year Report 2020-2021). This $60,000 income or below is impacting the lowest earning families in the United States when one compares it to the median United States household income with or without students in 2021 which was $70,784 (US Census 2021). Additionally, the Pell Grant has grown to 6.1 million recipients in 2021 which in 1976 was 1.2 million (CRS Pell Grant End-of-Year Report 2020-2021). Of these 6.1 million recipients, Pell Grants are also going to 41.5% of dependent public four-year undergraduate students in the United States (CRS Pell Grant End-of-Year Report 2020-2021). As of 2018 of all the Pell Grant recipients with family incomes of less than $20,000, their Pell Grant award coverage 30.4% of their cost of attendance (tuition and fees, books and supplies, room and board, transportation, and personal expenses) or a third of their education costs are covered by the Pell Grant (CRS Pell Grant End-of-Year Report 2020-2021). According to the equity indicator study, the college continuation rates of dependent 18-to-24-year-olds in 1970 was 46% in the lowest income quartile compared to 79% for the highest income quartile (Equity study and US Census Bureau 2020). That same college continuation rate has risen to 59% for the lowest income quartile compared to 85% for the

highest income quartile (Equity study and US Census Bureau 2020). This shows us that the college continuation gap or difference between the highest income quartile and lowest income quartile has gone from 33 in 1970 to 26 in 2020 (Equity study and US Census Bureau 2020). So, while there is certainly a debate on the impacts of the Federal Pell Grant since it started in 1972, the data from the impacts on equity from a household income standpoint would indicate that this program has had a positive impact on the US Higher Education System.

While the Pell Grant was and continues to be the largest federal aid program which is free to those who qualify, the Guaranteed Student Loan program which would later become known as the Federal Family Education Loan Program (FFELP) also started at the same time as the Pell Grant or via the Higher Education Act of 1965. In 1965 the federal student loan program was designed for the government to back the student loans that banks and other private lenders offered to help assist students with affording and accessing college (HEA 1965). In 1992 the Higher Education Act received amendments which created the Free Application for Federal Student Aid (FAFSA) along with the Federal Direct Lending program and the unsubsidized Stafford Loan program (HEA 1992). These Higher Education Amendments of 1992 allow the federal government to provide student loans directly to students without having to work with private banks or other lending agencies as they had since 1965 so it removed the middle person in the federal aid program (HEA 1992). This change in how federal aid was being administered set off a major change in how students would fund their undergraduate education. Since the HEA of 1992 the undergraduate new borrowers have grown from 3.3 million students to 6.3 million in 2017 with a peak of 8.3 million in 2011 (Congressional Budget Office Report 2020). During this same time period the outstanding balance of federal student

loan debt increased by sevenfold, from $187 billion to 1.4 trillion in 2017 dollars (Congressional Budget Office Report 2020). These trends in student borrowing since the HEA of 1992 impact the ability for students and their families to afford to attend college. As of 2019, the average annual undergraduate tuition and fees for full-time students at four-year public institutions was $9,200 which is an increase of 13% from 2010 (NCES Condition of Education 2020). Looking back at how many bachelor's degree recipients took out federal student loans for their undergraduate degree, the data shows that 46% of public four-year students are borrowing, which is down by 5 percent since 2010 (NCES Condition of Education 2020). As of 2018 student borrowing averaged $7,000. Borrowing continues to impact students' decisions for where they go to college and that was the original intent of the HEA of 1992 as it marks a significant change in how the federal government, state government, and institutions approach the equitable access or affordability for all to attend college. In addition to starting the explosion in student borrowing for college, the HEA of 1992 also made significant changes in the federal methodology which is the formula behind what today is better known as the FAFSA (McPherson & Schapiro, 1998). These changes have led to decreased funding by states while federal grants have remained constant resulting in institutional grants nearly tripling, and federal loans have dramatically increased (McPherson & Schapiro, 1998). Given the influence that the HEA of 1992 has had on the funding of a college education, it could be viewed as the most significant piece of federal legislation for higher education funding. Since 1992 the HEA has been reauthorized two other times in 1998 and then again in 2008 and has been extended since 2012 while Congress prepares changes and amendments. So while a lot has certainly changed in higher education since the HEA of 1992, this year and its reauthorization is important to understand

when reviewing the impacts of state need-based aid as changes in federal methodology or increases in loan eligibility need to be taken into consider when analyzing the decision factors college bound seniors in high school are considering in their college decision. The original intent of the federal methodology and financial aid in general was to provide equal education opportunities to student regardless of financial income. This means that financial aid is supposed to help with access or students getting into college and increase student choice or allowing students of all income levels to be able to pick their school of choice and not have to pick a school based solely on price. One of the issues in understanding the relationship of financial aid on students is that different populations of students react differently to various forms of financial aid. As an example of this minority students tend to avoid loans for their education even though that might be the only way for them to afford a top school of choice for them (St. John, Paulsen, & Carter 2005).

The history and impacts that these six events have had on the US Higher Education system demonstrate that both federal and state public policy decisions can have significant impacts on enrollments in higher education. From Supreme Court decisions to establishing a GI Bill that lead to the greatest growth in enrollments in the decade of 1940, events or decisions on public policy drive significant changes in decision making by those that the government is focused on influencing. However, not all these six events were equal in their impacts on higher education. The GI Bill is noted as being the best investment the US Government, but without the Morrill Acts, the GI Bill impacts wouldn't have been as great as the infrastructure or number institutions and programs were already in place to meet the significant growth brought on by the GI Bill (Herbold 1994-1995). Higher Education in the United States is not immune to being

influenced by the variety of events noted above which have impacted the size, shape, and purpose of how higher education benefits society.

Funding Public Higher Education Debate

In addition to the historical events that impact how higher education was developed and funded, there are many public policy issues surrounding the debate of why federal and state governments fund higher education. The debate of public funding for higher education both at the federal and state level is not a new debate as noted above in how state funding was developed over time which primarily went to support the operating expenses of public institutions. Included in the operating expenses was the cost to attend public institutions which is defined as the tuition rate or expense which is charged to students. This initial funding by states helped to maintain low tuition for students and promote equal access to public higher education. Maintaining low tuition came into question in the early 1970s when three national reports recommended that states shift from low tuition models to a hybrid model that is based on a cost-sharing between the state and students (Carnegie Commission on Higher Education 1973, Committee for Economic Development 1973, Newman Commission 1971). It is at this point that cost-sharing was defined as a partnership between the state, students, and the families of the students. This shift continued into the 1980s with the ideology moved from equity as the focus to including the individual responsibility in funding models (Chen & St John 2011). The federal government began to decrease the Pell Grant funding and shifted its focus to developing subsidized loan program for students and their families. This change at the federal level is explored in more detail in the Pell Grant section below which includes the student loan impacts as well. For states the shift from just keeping tuition low to expanding or sharing the

costs of higher education with the student began the increases to tuition rates without increasing investments in state appropriations for needs-based aid (Chen & St John 2011). Changes in ideology have continued since the 1980s and even today there are two primary funding focuses at the state level. The first is to fund general operating expenses of institutions. The second option is for states to direct funds to students in the form of state financial aid programs which expand the support from federal financial aid programs like the Pell Grant (Laderman & Weeden 2020). General operating expenses or funding institutions by the state totaled $92.8 billion in current and constant dollars in 2022 which represents 78.5% of state and local higher education funding (SHEF Report 2022). Funding which was allocated directly to students came in the form of student financial aid which has increased over time but is still significantly below general operations at $12.8 billion in current and constant dollars in 2022 (SHEF Report 2002). This data shows that states continue to invest more state funding into general operations over the other option of student financial aid programs. However, the proportion of state and local funding excluding stimulus funding that was allocated to financial aid increased from 5.9 percent in 2007 to 8.6 percent in 2022 which might be signaling a shift in how states will fund public higher education.

These changes in state and federal funding models highlight the fundamental questions which state and federal policymakers must consider in each budget cycle when allocating limited public dollars. One of those questions, or measures of effectiveness, which policymakers must consider are student outcomes or what relationship state increases or decreases in public funding for higher education will have on student outcomes. Included in these considerations for policymakers are what portion of the state higher education funding is best set aside for

general operating expenses which can keep tuition low while also keeping in mind that student financial aid investments can target low-income students. Finally, the policymaker must keep in mind that each of these first considerations have an impact on enrollment, graduation rates, credential completions, as well as future workforce implications. Policymakers must breakdown if the funding going to public higher education is benefiting both the individual or the student attaining the degree and society or the public at-large.

For the individual or the student attending college, the research shows that college-educated workers with a bachelor's degree produce more than half of the national annual economic value (Carnevale & Rose 2015). Similarly, Hout (2012) argued that that individuals that graduate from college are twice as likely to have higher incomes, live happier lives, and contribute to socio-economic and the well-being of society. According to the 2022 US Bureau of Labor Statistics survey those with bachelor's degrees earned a median of $1,035 a week, while high school graduates earned $781 which annually computes to a difference of almost $30,000. While higher incomes are not the only benefits of a college degree, the various examples of research show empirical evidence that college degrees benefit taxpayers in all states.

If individuals are shown to benefit from an investment in public higher education the other side of the debate for policy makers continues to be how does society overall benefit from investments that states, make in higher education. Evidence also supports that public benefits to society are greater than private or individual benefits when states invest in higher education (McMahon 2009). An additional study (Ma et al. 2019b) found that the primary reason states collectively allocated more than $100 billion for higher education in 2019 was due

to the increased in public benefits like; increased democratic engagement, reduced crime and health-care costs, lower poverty rates, and higher state tax revenue.

In addition to debate on how policymakers fund higher education, there must be an understanding of how students are making their college decisions so that the theory meet the practice. This is where the research from the human capital model is important as this research found that students make college decisions based on comparing the cost of college to the benefits from going to college (Mincer 1958, Fack and Grenet 2015). Other research has focused on the impacts of reducing costs or increasing needs-based aid to student which is based on research findings that found increases in enrollment and attainment occurred when financial aid, not specifically needs-based aid, is increased to student in the college search process (Angrist 1993, Angrist, Lang, Oreopoulos 2009, Bound and Turner 2002, Castleman & Long 2013, Dynarski 2003, Goldrick-Rab et al. 2012, Stanley 2003). Most of the research is specific to one or two programs and it is unclear if these increases in enrollment and attainment would be realized in larger needs-based aid programs. The Pell Grant is the largest needs-based aid program funded by the federal government. Different studies have focused on understanding the relationship that this federal program has had on higher education enrollment, but the conclusions are mixed (Bettinger 2004, Castleman and Long 2013). All these studies mentioned above were focused on specific populations like the relationship of the Pell Grant on persistence of first-year to second-year students which found that dropout rates declined (Bettinger 2004). A similar study from Bettinger (2015) used a difference-in-difference model to identify how the new needs-based aid program in Ohio would impact college persistence. That research showed that when Ohio increased its needs-based aid program by

$800 per eligible student that their dropout rate decreased by 2 percent (Bettinger 2015). In addition to the findings of decreased dropout rates the Bettinger (2015) study also found increases in the likelihood that students would attend 4-year colleges and their first-year graduate point average rose as well. The Castleman and Long (2013) study found an increase of 3.2 percent in college attendance and a 4.3 percent increase in persistence rates for Florida students based on increased funding in needs-based aid programs. In both the Bettinger (2015) and Castleman and Long (2013) studies the conclusions are limited to specific programs in the states of Ohio and Florida which is difficult to draw conclusions for the larger impacts of needs-based aid programs.

Effectiveness of Largest Needs-Based Aid Program- Pell Grant

When the federal government introduced Higher Education Act of 1965 it positioned itself as the primary funding source for students and their families in funding college access. The goals of this 1965 public policy have delivered on its goal to expand access to students no matter their family background or what major or career of interest the student would be pursuing. However, the question that still needs to be reviewed is how effective the various financial aid programs in this public policy have done at impacting or meeting the goals which started in 1965 with President Lyndon Johnson. The complexity of the student aid system includes financial aid programs such as; federal and state grants, subsidized and unsubsidized loans, work-study programs, and tax credits. Each of these various financial aid programs bring with them a set of eligibility requirements that include some form of financial needs-based aid determination. The primary formula used to determine this at the federal level is the Free Application for Federal Student Aid (FAFSA) which comes from the Higher Education Act of

1965. In addition to the needs-based aid criteria, the second funding criteria model is merit-based aid or funding awarded based on the academic achievements of college bound students based on their academic achievement either in via their high school gpa or based on a standardized test score. My analysis explored in more details the debate over merit-based aid versus needs-based aid in a later section, but to start there needs to be a focus on evaluating the effectiveness at driving enrollment, persistence, or completion in some of the major financial aid programs which as noted below in the Table 1 are the Federal Pell Grant and the Federal Student Loan programs. As Table 1 below demonstrates, the Pell Grant and Student Loans have represented the largest funding model available to students and their families in funding a college education until more recently or in 2021-2022. These two federal aid programs, Pell Grant and Student Loans, have accounted for over 55% of all funding over the last three decades until more recently when they have declined to 43% of all federal funding. At this juncture, the emergence of growth in state grant programs becomes apparent, marking the specific focus of my analysis. My research aims to comprehend how this expansion of state grant programs is influencing resident enrollment nationwide.

Table 1. Total Student Aid and Nonfederal Loans in 2021 Dollars (in Millions)

Financial Aid Programs by Year	1991-1992	2001-2002	2011-2012	2021-2022
Total Federal Grants	$14.4	$18.9	$53.4	$36.5
Pell Grants	$11.5	$15.3	$40.4	$25.9
Veterans	$1.7	$2.5	$12.1	$9.8
Other Grants	$1.1	$1.1	$0.9	$0.9
Total Federal Loans	$22.5	$57.3	$128.9	$82.0
Subsidized Stafford	$18.8	$26.6	$48.9	$15.4
Unsubsidized Stafford	$0.0	$22.5	$56.6	$43.8
Plus (Parent Loans)	$2.0	$6.3	$13.3	$10.4
Other Federal Loans	$1.7	$0.0	$10.2	$12.4
Federal Work-Study	$1.2	$1.2	$1.2	$1.1
Education Tax Credits	$0.0	$7.8	$24.3	$10.8
State Grant Programs	$4.0	$7.9	$11.3	$13.0
Institutional Grants	$14.1	$25.9	$50.2	$74.4
Private and Employer Grants	$4.8	$9.8	$17.0	$16.8
Nonfederal Loans	$0.0	$9.5	$10.0	$12.7
Total Support for Students	**$61.0**	**$138.6**	**$296.3**	**$247.3**
Total Pell Grant + Federal Loan as a % of Total Support	**55.7%**	**52.4%**	**57.1%**	**43.6%**
Total Nonloan Aid	**$38.5**	**$71.8**	**$157.4**	**$152.6**

Source: College Board, Trends in Student Aid 2022

The Pell Grant program is the largest grant program in the federal financial aid system with a focus on expanding access to higher education for lower-income families. This program possesses crucial features that are integral to my analysis, notably as the Pell Grant stands as the largest and most enduring student needs-based aid program. Looking deeper into the Pell Grant spending from 1991 to 2011, the spending increases by $28.9M and then peaks, but even as of 2021-2022 the Pell Grant spending is up from 1991-1992 by $14.4M. My research focuses on two pivotal areas that underscore the reasons for the increase in the Pell Grant since 1991. The first of those is a rise in the number of students attending college and the second has been an increase in the allocation formula which Congress has expanded specifically the maximum Pell amount (Dynarski & Scott-Clayton 2013). What Dynarsky and Scott-Clayton focused on was

understanding the impacts of a complex federal aid allocation system (FAFSA) and ways to reduce the barrier to receive the aid by those most in need. The impacts of how the FAFSA works and more specifically how the Pell Grant is awarded is not the focus my research, but it does support two of the key data points in this research project or that spending amounts need to be reviewed along with population increases. Additionally, Dynarsky and Scott-Clayton (2013) note that Pell Grant expenditures have also increased due to a weak labor market over the timeframe of 1991-2012. There are certainly ways to improve how the Pell Grant students apply for the funding and the research by Dynarsky and Scott-Clayton (2013) proves that there are ways to use federal tax filings and remove the FAFSA entirely while still matching current Pell Grant allocations. In a study reviewing low-income or those families making less than $30,000 in 2011-2012, only 69% of these low-income students filed a FAFSA and received the Pell Grant (Delisle 2017). The remaining 31% of low-income students that were enrolled at any higher education institution either filed and didn't receive the Pell Grant or they didn't file (Delisle 2017). Filing rates for lower income families is another example of where the Pell Grant has more room for growth which reinforces that the work of Dynarsky and Scott-Clayton (2013) needs more attention.

While the work of Dynarsky and Scott-Clayton (2013) is important in understand the relationship of Pell Grants to student enrollment, my researc is not focused on how reducing barriers to accessing needs-based funding could impact student enrollment. Instead, my research is focused on how other studies or programs such as the Pell Grant have worked or impacted student enrollment over time. One of key findings in how needs-based aid programs have improved access to higher education is by increasing access for lower-income families.

There have been some studies that have shown that the Pell Grant has increased the number of lower-income students attending college dating back to 1979 (Leslie & Brinkman 1987). However, there is growing concerns that the purchasing power of the Pell Grant is in sharp decline with the maximum award covering 94% of tuition and fees in 2004 at four-year colleges, but only 61% in 2015 (Ma and Matea 2021).

The Pell Grant is the longest running and largest needs-based aid program that students can use towards improving the cost of college. However, the research has mixed reviews on the impact that the Pell Grant has on enrollment. In a study by Hagedorn, Mensel, Friedel, Lui, Smith, Tarrant, and Katsinas (2018) the findings were that the Pell Grant increased the college enrollments of adults and non-traditional students. A similar study of the enrollment impacts of the Pell Grant by Rubin (2011) found that enrollments of traditional college age students were not statistically significant when measuring how Pell Grants impacted their enrollment rates. Even if the research has mixed results, the future for Pell Grants is to adjust to the growing changes of higher education and the goals of the United States related to educational attainment. Because of these growing changes, US President Biden signed a $1.7 trillion federal bill in December of 2022 that changed who is eligibility for Pell via an updated FAFSA formula along with an increase in the maximum Pell Grant by $500 from $6,895 for 2022-2023 academic year to $7,395 for the 2023-2024 academic year (Douglas-Gabriel & Stein 2022). These recent changes to the Pell Grant eligibility and amount of funding support the prior research that the Pell Grant is measured in public policy for the benefit is brings lower-income families and their ability to access a college education.

Merit vs Needs-Based Aid

As noted earlier, the Pell Grant is the first example of a needs-based aid program designed to improve college access for high school students from lower-income families. The Pell Grant and all future needs-based aid along with merit-based aid programs depend on the assumption that students will find value in going to college if the perceived outcome or benefit exceeds the costs (DesJardins & Bell 2006). So, while college attainment is not limited to costs it has been shown to be a critical factor in the decision of where students attend college. At the federal level there is not a merit-based aid program like what one can see with the Pell Grant or a federal needs-based aid program. States are adopting various financial aid programs with some focused on the merit-based aid program which traditionally has benefited higher-academic achieving students who come from higher income families (McLendon, Tandberg, & Hillman 2014). Then there are other states that are focused more on increasing their state funding to lower-income families via needs-based aid programs (McLendon, Tandberg, & Hillman 2014). The determination of greater value hinges upon funding objectives, a point my research aims to contribute to by exploring the interplay between state needs-based aid and in-state enrollments.

The merit-based aspect of the debate is enriched by extensive research, yielding significant findings regarding the correlation between merit-based aid and migration patterns. For instance, one study revealed a notable 10.4% increase in residents remaining within states offering such programs (Ness 2010, Doyle 2006, Heller 2002, Cornwell, Mustard, & Sridhar 2006, and Cooke & Boyle 2011). Another important note is that merit-based programs tend to ignore need and thus benefit more higher income families who, aren't the families that are

having the access issues (Heller 2002). Additionally, Heller (2002) found that merit-based programs do not improve high school achievement along with showing little impact on how hard high school students will work in the classroom. Merit-based aid is the most common form of performance-based funding and is typically not allocated to a state's institutions, but instead it is given to in-state college students (Sjoquist & Winters 2015). States justify merit-based programs to increase college enrollment, keep their best high school students in state for college, and promote academic achievement (Cornwell, Mustard, & Sridhar 2006). These justifications came from the first merit-based program which was the HOPE "Helping Outstanding Pupils Educationally" program which gained it's funding through the state lottery in Georgia in 1993. This program has been the model for 14 other states who have implemented similar "HOPE-like" merit-based scholarship programs (Heller & Marin 2002). The reason for modeling this program is that research found the HOPE program achieved the funding goal with a 5.9 percent total college enrollment growth from mostly 4-year public institutions and of that growth 80% is coming from those who were less than twelve months out of high school (Cornwell, Mustard, & Sridhar 2006). Another important finding for the HOPE program research was that blacks outpaced whites in the growth which other studies have noted as being the detriments of merit-based programs (Heller 2002). However, the authors of the HOPE research noted that the good news on blacks outpacing whites might be due to having larger HBCUs (Historically Black Colleges and Universities) in these areas (Cornwell, Mustard, & Sridhar 2006) which reduces the value of these findings. Shell's (2016) study presented contrasting findings compared to earlier research conducted in the early 2000s by Cornwell, Mustard, and Sridhar (2006), indicating no statistically significant impact on college

enrollment resulting from the HOPE scholarship. Other studies have looked at the impacts of policy processes through which merit-based aid criteria is determined (Ness 2010). A study looking at policy process by Ness (2010) showed the impact that processes have on merit-based program designs which filled in a research gap from previous studies that were designed to measure relationship of policy entrepreneurs on the establishment of merit-based aid programs in states (Ness 2010). A key distinction between the research done by Ness (2010) and Baumgartner and Jones (2002) was looking at the process or system compared to the individual. Both the individual and system or processes have different influences on how merit-based aid is developed and implemented (Ness 2010). A study by Weertz and Ronca (2016) focused on the impact of merit-based aid on college enrollment and retention. They found that merit-based aid can attract high-achieving students, it may not significantly affect overall enrollment rates or retention, suggesting a more nuanced relationship between merit-based aid and student outcomes.

The state of Tennessee took a unique approach to state-wide merit-based aid programs called the Tennessee Educational Lottery Scholarship (TELS) where the eligibility is based on both their high school academic performance and extra-curricular participation (Lee 2014). In addition to the adding criteria for extra-curricular participation the TELS tries to address the negative social consequences found in the allocation of merit-based aid to minorities by adding increased award and expanding eligibility for lower-income students (Lee 2014, Ness & Tucker 2008, Ness & Noland 2007). The results were promising as it was found to have increase the college enrollment rates for minorities in Tennessee compared to their white or majority counterparts (Ness and Tucker 2008).

In summary, merit-based aid is the predominate form of financial aid that states are using in their funding of higher education aid. However, what these various state merit-based programs show is that the measurement of the return on investment fluctuates significantly among the states noted above. Additionally, the merit-based aid approach by states is a mechanism for attracting a higher quality academic student which the majority are from higher income levels (Ness & Noland 2007). This leads to the justification for new approaches to state financial aid allocations that tries to even the playing field or increase access for minority students. If a state wants to grow quality the best tool based on research is the merit-based aid approach, but if a state wants to increase access then states like Tennessee and the TELS must focus the criteria on a success measurement that incorporates need into the allocation criteria.

On the need-based side of this financial aid debate or the contrast to merit-based aid, the distribution of aid being focused on those students who come from lower-income families. The United States is not alone in funneling federal funding into needs-based aid programs aimed at improving persistent earnings inequalities (Fack & Grenet 2015). Examples of programs like the needs-based aid Pell Grant in the United State are; the Maintenance Grant in the United Kingdom, the Spanish Becas, and the French Bourses sur criteres sociaux (Fack & Grenet 2015). No matter the country, each of these programs follow similar goals to other needs-based aid programs which is focused on improving access as well as bringing more equity to the distribution of limited resources (Miao 2012). This needs-based aid approach is counter to what was just reviewed with merit-based aid where the funding is focused on increasing the quality of students attending college.

Needs-based aid programs have noble aspirations with a common goal of providing students with the highest financial need or those students coming from the lowest income households with as much funding as legislatures are willing to fund to ensure that these students can attend college with minimal financial burdens (Alon 2011). The kind of funding that falls under the needs-based aid programs are; student grants, federal grants like the Pell Grant, federal work-study programs, federal loans, and federal educational grants. There are also state needs-based funding that falls under similar categories as those listed above. Each of these funding methods has different stipulations both in qualification and in how the funding comes to the student. My research does not spend a lot of time focused on defining each of these funding sources as the more important reason for including these funds is to note that needs-based aid can include funding that is both free or without repayment as well as students loans and federal work-study which require repayment either in the form of money or in the students time. Federal loans, work-study and the Pell Grant all follow students no matter the college they decide to attend which supports the focus of this research on how variations in state funding are critical to study for better understanding the impacts these programs can have on resident enrollment rates. For students grants both at the federal or state level, students will not have to repay the funding. Despite the large financial investments that countries and various states in the United States have put into needs-based aid program, there is little know about the effectiveness of these programs on both resident enrollments and low-income students. My research helped to fill the gap in the research by analyzing the relationship that needs-based aid has on resident enrollment rates.

The results of my research will build on the growing consensus of previous studies which note that needs-based aid programs have significant impacts on college persistence, attainment, and enrollment. Additionally, my research will make a significant contribution to the literature on student aid as it provided insight into how well needs-based aid programs work across the United States or a broader understanding of how needs-based aid impacts resident enrollments.

State Financial Aid Impacts on Migration

One measurement of a successful merit-based program is the ability of the program to reduce the migration of college-bound resident enrollment going to other states. While this is noted as a factor for need-based programs, these programs tend to be designed for access purposes. However, merit-based programs do impact a reduction in the number of college-bound residents migrating out of state for college (Cooke & Boyle 2011). Research conducted by Cooke and Boyle (2011) found that college-bound resident enrollment migration is not just about the state's characteristics, but it is also influenced by the opportunities in every other state and their distance from other colleges or universities relative to the origin state. Research shows that out of state enrollment migration increased based on; per capita income in origin and destination, private college costs of attendance and origin, and decreased with measures of educational quality in the destination (McHugh and Morgan 1984). This is not the case for in-state enrollment migration which research shows a positive correlation to the quality and size of university and negative correlation to tuition or cost variables (Adkisson & Peach, 2008). So, investing in merit-based aid or even need-based aid to impact in-state or resident enrollment migration could be bad investment as what moves students in from out-of-state are the size

and quality of in-state institutions and not as much the cost of attending your in-state institution. An opportunity does present itself with this research as it shows states can see decreases in out of state enrollment migration through merit-based programs shown through the HOPE research which found a 5.9 percent increase in enrollment (Cornwell, Mustard, & Sridhar 2006) with most of it being an out of state enrollment migration decrease. Location also plays a significant role in impacting out enrollment migration from merit-based programs (Cooke & Boyle 2011), but little is known about the need-based aid side.

Thus far my research has explored the impact of merit-based aid on college choice which shows some significant results, but another key measurement that many states use to justify investing in merit-based programs are enhancing the state workforce (Zhang & Ness 2010). Multiple studies (showing slightly different relationships) have found that merit-based aid programs do assist states in growing their future workforce (Perry 2001, Groen 2003). However, both studies focused explicitly on the merit-based impacts and didn't account for what kind of income level these students came from. Additionally, these studies on workforce enhancement were conducted with data that occurred prior to the great recession. There is room for more research on whether merit-based aid programs have an impact on state workforces and on access.

All but two states in the United States have need-based aid programs, but they vary in funding from South Dakota's $230,334 to Texas's $835 million (Pingel 2017). Each of these states also vary in the number of public universities along with high school graduation rates which makes for an interesting study of need-based aid programs and whether or not those states with larger need-based grant funds see higher rates of needy students as defined by

levels of the Free Application for Federal Student Aid (FAFSA). Research conducted by Singell, Waddell, and Curs (2006) showed that merit-based aid programs like the HOPE program in Georgia have assisted in the increase of Pell eligible students, but it appears to only help those looking to attend two-year or less selective four-year institutions. However, there is a gap in this research on if state need-based aid programs alone are having the impacts or accomplishing the goals which state legislators intended when funding these programs. In the end, the goals of all state based funded programs should be to benefit the residence of the state where the funding comes from. Need-based programs are no different from other funded programs in that they need to be researched with carefully developed goals to see if they are keeping students who graduate from the state's high schools in-state so that both the publicly funded state institutions and the citizens of that state are benefiting. The focus of my research is on meeting that gap in research or if need-based programs can increase the enrollment rates of resident (in-state) high school graduates in public in-state universities.

Chapter Three: Research Design Method and Data Collection

This chapter will cover the methods and data used to examine the research question of do states with higher average need-based funding per high school graduate see an increase in residency or in-state enrollments rates? I used a multivariate linear regression analysis to measure the effect of state funded needs-based aid on residency or in-state enrollment rates in each of the 50 states and the District of Columbia from 2000 to 2020.

My research focused on two dependent variables that are constructed using data from IPED's Enrollment Survey. The first dependent variable is Stay Rate or the percentage of total

public high school graduates that stay in-state for college. This variable is the percentage of high school graduates who graduated from a public high school in the previous 12 months and enrolled in one of their home state public 4-year institutions. My second dependent variable is the college continuation rate. The college continuation rate is calculated by dividing the total number of state residents attending college anywhere by the total number of public high school graduates from IPEDS. Those two dependent variables of stay rate and college continuation rate were used to determine the relationship of state needs-based aid on residency enrollment for all 50 states and the District of Columbia from 2000 to 2020.

I use stay rate and college continuation rate to examine their relationship with needs-based aid. My first hypothesis is that needs-based aid is correlated with stay rates. The second hypothesis is that needs-based aid is correlated with continuation rates. More details of all the independent variables and what sources were used to collect these variables can be found in the data section below. Each of the independent variables are inputs or predictors that are used to influence or explain changes in the stay rate or dependent variable. The independent variables are collected for each state; undergraduate needs-based aid, per capita income, annual unemployment rate, state funding for higher education, and Kiplinger's Best College Value.

Research Design Method

For this analysis, I used multivariate linear regression models to analyze the relationships between multiple independent variables and the dependent variables of stay rate and college continuation rates in each state along with the District of Columbia from 2002 to

2020. The research question is will states with higher average need-based funding per public high school graduate see an increase in the stay rate or residency enrollment rates? The following are my two null and alternative hypotheses for a two-tailed test of the research question. Starting with the stay rate the null hypothesis(H0) is that needs-based aid has no relationship or correlation with the stay rate or those public high school graduates that do not leave the state for college. If the results show a relationship between needs-based aid and the stay rate the null hypothesis will be rejected.

H0 = Needs-based aid per public high school graduate has no correlation correlated with stay rate.

H1 = Needs-based aid per public high school graduate is correlated (positively or negatively) with stay rate.

The second hypothesis looks at the relationship between the college continuation rate and needs-based aid. The second null hypothesis is looking to see if there is a relationship or correlation with the college continuation rate or those public high school graduates that go anywhere to college both in-state or out-of-state. If the results show a relationship between needs-based aid and the college continuation rate the null hypothesis will be rejected.

H0 = Needs-based aid per public high school graduate has no correlation with college continuation rate.

H1 = Needs-based aid per public high school graduate is correlated (positively or negatively) with college continuation rate.

Given the complexity of the data being collected, a multivariate linear regression analysis was be used to test these hypotheses. I used a multivariate linear regression analysis with the goal of creating a linear equation that best described the relationship between the independent variables; undergraduate needs-based aid, per capita income, annual unemployment rate, state funding for higher education, and Kiplinger's Best Value Colleges. Included in my modeling was the usage of fixed effects which represent individual-specific characteristics or unobservable factors that are unique to students or households. Fixed effects capture the average deviation of each entity (e.g. states) from the overall intercept of the model, controlling for unobserved heterogeneity across entities that may influence the dependent variables of stay rate or college continuation rates (Baltagi 2008). By including fixed effects as dummy variables, my analysis can account for time-invariant factors such as distance, politics, state policies, climate that may impact the decision to stay in a location or institutions both in and out of state.

Using fixed effects in my regression model helped to control for unobserved heterogeneity across entities, such as states that may bias the estimates of the effects of needs-based aid, per capita income, and unemployment rates on the stay rate or college continuation rate of recent public high school graduates in my model (Frees 2004). By including fixed effects, I can improve the validity and reliability of the regression analysis and obtain more accurate estimates of the relationships between my independent variables; independent variables; undergraduate needs-based aid, per capita income, annual unemployment rate, state funding for higher education, and Kiplinger's Best Value Colleges to the dependent variables of stay rate and college continuation rates.

Data and Variables

The data and variables in this model follow previous models like the human capital model which predicted that students have a higher propensity to enroll in college when the cost to attend college is reduced (Toutkoushian & Hillman 2012). However, this student demand can also be understood from previous research which showed that the following three areas need to be accounted for; the price of an education based on the income of the buyer, tastes or preferences of the buyer, and the value of the education from a consumption or investment perspective (Leslie & Brinkman 1987). I also used the human capital model to pull in variables that helped measure increases in state financial assistance like; federal funding to state educational by state per public high school graduate and the amount of state need-based aid by state per public high school graduate (Toutkoushian & Hillman, 2012).

I used data that is publicly available via the Integrated Postsecondary Education Data System (IPEDS) which is administered by the National Center for Education Statistics (NCES). Below is a detailed summary of the data along with all the variables used in my research. The primary data sources are IPEDS via the NCES tool which collects data on the residence and migration of all first-time degree/certificate-seeing undergraduate in degree-granting postsecondary institutions, by state or jurisdiction for every other year since 1996 via NCES data center. My research focused on the entry years of 2000 through 2020 and the associated data by each of the 50 states and the District of Columbia but excluded U.S territories and some foreign countries that are reported in the NCES data. Only public four-year institutions were

used as these data are more complete and there is a higher concentration of in-state students at 2-year institutions.

The first dependent variable in my research is the percentage of high school graduates who graduated from a public high school in the previous 12 months and enrolled in one of their home or resident state public 4-year institutions (Stay Rate). It is also important to note that NCES only reported on resident enrollment for every other year, so I included 10 different years from 2000 to 2020. This dependent variable required the collection of three different variables via the NCES data center. The first was designated in the equations below as (a) the total number of high school graduates from 2000 to 2020 (Total Public High School Graduates). The second data point designated in the equations below as (b) is the number of state residents that continued or enrolled in any state who graduated from high school in the previous 12 months (Total State Residents Attending College Anywhere). The third data point designated in the equations below as (c) is the number of state residents that enrolled in their home state (State Resident Staying In Home State). These three data points were used to calculate the first of two dependent variables. The first dependent variable, stay rate, had the following equation:

% of public high school graduates that stay in state for college (stay rate) = c / a

The second dependent variable, college continuation rate, is noted in the following equation:

% of public high school graduates that attend college in any state (college continuation rate) = b / a

The primary data point for the total number of public high school graduates by state is available from the IPEDS Common Core Data which is in the NCES database. I pulled the total number of public high school diplomas awarded in each academic year which had the corresponding

resident enrollment data from NCES or every other year starting in 2000 through 2020. The public high school diplomas awarded was the spring of 2000 since this is the first year being measured in my research and run through every other year until the last year which is the public high school diplomas awarded in the spring of 2020. I used the percentage of public high school students as not all high school graduates go to college and my research measured for the impacts of larger or smaller college going rates amongst the 50 states and the District of Columbia and the relationship that needs-based aid programs might have on this college going rate. The full summary of the mean and standard deviation for each of the 50 states for the stay rate, college continuation rate, and total public high school (hs) graduates in my model can be found in Table 4.

Needs-based aid by state per public high school graduate is collected from the National Association of State Student Grant and Aid Programs (NASSGAP) survey of state-funded expenditures for postsecondary student financial aid. The figures in the data are reported in millions of dollars. Then each of these states' annual needs-based aid funding was divided by the total number of public high school graduates in each state from 2000-2020. Each of the 50 states along with the District of Columbia has 10 years of corresponding state and federal aid on the years in which the state has corresponding enrollment data from 2000-2020. The survey started in the 1969-1970 fiscal year and notes even in the first survey, the challenges that states faced was no different from today where states had to determine what should be provided from state funds and what amount of dollars should be charged to students and/or their families. In the 1999-2000 academic year, the states awarded $4.089 billion in current and constant 1999 dollars in need and non-need-based student grant aid to more than 2.5 million

students which was an increase from almost 11% in expenditures from 1998-1999 academic year (31st NASSGAP Report 1999-2000). Fast forward to the 2019-2020 academic report and the states were awarding about $14.8 billion in current and constant 2019 dollars in total state funded student financial aid which is an increase of just under $10 billion in current and constant dollars since the 1999-2000 academic year. Eight states (California, Texas, New York, New Jersey, Virginia, Illinois, Pennsylvania, and Washington) in the 2019-2020 school year made up almost 69% of all needs-based aid with a total funding of $6.3 billion in current and constant 2019 dollars (51st NASSGAP Report 2019-2020). This compares to the 1999-2000 report where six states (California, Illinois, New Jersey, New York, Pennsylvania, and Minnesota) made up 59% of all needs-based funding with a total amount of $1.9 billion in current and constant 1999 dollars (31st NASSGAP Report 1999-2000). All but two states reported some needs-based funding (Georgia & Wyoming) compared to the 1999-2002 report showing three states who were not funding a state needs-based program (Alaska, Georgia, and South Dakota).

Another independent variable which has important impact on a student's ability and willingness to attend college is their household income. Previous studies have shown that per capita income affects the student's ability and willingness to enroll in college (Betts & McFarland 1995; Buss Parker, & Rivenburg 2004). This research follows the economic theory which finds that an increase in consumption of normal goods (college education) occurs when incomes are higher. The data on state per capita personal income can be found at the Bureau of Economic Analysis and my research adjusted the income data by the Consumer Price Index to reflect real-dollar value. Each of the 50 states along with the District of Columbia had 10 years

of corresponding state per capita personal income based on the years in which have corresponding enrollment data from 2000-2020.

An additional independent variable that helps to control for both a student's ability to afford a college education along with a state's economic health is the annual unemployment rate by state for the years of 2000-2020. This data was collected from the Bureau of Labor Statistics (BLS) which releases annual unemployment rate figures that serve a critical indicator of the economic health of states from 2000-2020. These figures represent the percentage of individuals within the labor force who are actively seeking employment but are currently without a job. In this report there is a wide range of annual unemployment rates with a maximum of Nevada in both 2010 and then again in 2020 at a rate of 13.8 and 13.5. Not only does these data help in understanding the relationship that needs-based aid investments have on the stay rates of students in each state, but annual unemployment rates are also essential for policymakers to assess the effectiveness of economic policies, provide insights into the health of the job market, and are also used to anticipate potential changes in consumer spending patterns which all influence a family or students college decision.

The next independent variable is the state funding of higher education expenditures inclusive of capital. This variable used the data from the National Association of State Budget Officers (NASBO). NASBO is a professional organization that represents state budget and finance officials throughout the United States. It was established in 1945 to serve as a resource hub and advocate for sound fiscal management practices as the state level. In 1987 NASBO released the first State Expenditure Report which has developed into a definitive baseline for the analysis of state spending. These data reflect support of public university systems,

community colleges, and vocational education institutions. It is broken down by total state spending on higher education, general fund expenditures, other state funding, and bonds. The data for the state funding of higher education by state from NASBO was collected from 2000 to 2020 for all 50 states along with the District of Columbia in which there was corresponding enrollment data. While collecting these data on state funding, I found that the District of Columbia did not report its state funding for 8 years along with one year for; Alaska, New Hampshire, West Virginia, and Wyoming. Additionally, some states wholly or partially exclude tuition and fees, and some also wholly or partially excluded student loan programs. This was noted in the limitations section of this report given that the variable of public in-state tuition and fees is another independent variable in the model.

As noted above, in-state migration of students has been shown to have a positive correlation to the quality and size of university and negative correlation to tuition or cost variables (Adkisson & Peach, 2008). For this reason, I included the independent variable of Kiplinger's Best Value Colleges. Kiplinger is a respected and widely recognized publisher of personal finance and business content. This variable and rating were used to assess college and universities based on factors such as; affordability, academic quality, graduation rates, and student debt. This variable was also included because of its measure of affordability as cost is important factor in the decision on where to attend college. Because this rating wasn't available for the year 2020 this paper used the 2018 rankings for both the 2018 and 2020 years in the model. An additional calculation was made with this variable to be either zero or one where this data shows if a state has zero institutions that are in Kiplinger's Best Value Colleges for that year or if they have more than one. There is a variety of states in this model which see

increases, decreases, and consistencies in how many Kiplinger's Best Value institutions that in their states from 2000-2020. A few examples states like; Maryland, Michigan, and Mississippi who have seen increases in the number of institutions in their states which have made Kiplinger's Best Value list over the years of my research with jumps from zero in some years to as many as three or four in other years. An interesting example was New York where in 2002 it had two institutions in Kiplinger's Best Value rankings and by 2020 it had eleven which was second to only California with 12. Then there were states like; Georgia, New Jersey, and Pennsylvania which lost two to four institutions in the rankings throughout the years of 2000-2020. Finally, states like; Montana, Nevada, North Dakota, and South Dakota were constantly at zero for institutions in their states with a Kiplinger's Best Value rating. Given the variety in rankings noted above, this additional variable allowed this second regression analysis model to control for the impacts that the quality of institutional options have on a resident student's decision on where to attend college.

All the variables in my research are important for policy makers to understand based on what the goals of adding a needs-based aid programs could do for their state. One of the reasons that policy makers might support adding needs-based aid is to make college more affordable for their high school graduates. However, the goal in some states might also be to target a specific low-income family and trying to improve the affordability to attend college in their state. Policy makers might also see a benefit to supporting a needs-based aid program for their state to reduce the number of students leaving the state or trying to reduce the brain drain for their state. Thus, why each of these variables are important to measure as there will

be varying goals associated with why states support or want to measure the success of a needs-based aid program. Below is a summary of the variables in my analysis.

Table 2. Descriptive Statistics of Model Variables

	Mean	Std. Deviation	Min	Max
Dependent Variables				
Stay Rate (Public HS Grads Staying in Home State Public University)	32.79	8.71	9.37	57.86
College Continuation Rate (Total HS Grads Going Anywhere for College)	47.07	9.61	22.33	75.30
Independent Variables				
Needs-based Aid per HS Graduate in $1000s	1.12	1.18	0.00	8.21
Per Capita Income by State in $1000s	41.67	10.98	21.24	89.70
Annual Average Unemployment Rate by State	5.63	2.01	2.10	13.80
Total State Funds for Higher Education Expenditures Inclusive of Capital Per Public HS Graduate in $1,000s	58.86	34.27	4.76	174.54
Kiplinger's Best College (1 or 0)	0.73	0.44	0.00	1.00

Chapter Four: Results

The results of my analysis below demonstrated a positive correlation between higher levels of needs-based aid per public high school graduate and increased rates of retention in home state universities, as well as higher rates of college continuation. These findings underscored the importance of need-based financial assistance in facilitating students' decisions to stay within their home state for higher education, offering valuable insights into the interplay between educational policies and student behaviors.

Table 3. Multivariate Regression Results

Independent Variables	Stay Rate (1)	Stay Rate (2)	College Continuation Rate (3)	College Continuation Rate (4)
Needs-based aid per HS Graduate in $1000s	1.040**	1.109*	1.388**	1.422*
	(0.368)	(0.525)	(0.485)	(0.699)
Per Capita Income in $1000s		-0.024		0.011
		(0.043)		(0.045)
Annual Average Unemployment Rate by State		0.042		-0.003
		(0.114)		(0.124)
Total State Funds for Higher Ed. Expenditures Inclusive of Capital Per Public HS Graduate		0.028		0.018
		(0.016)		(0.017)
Kiplinger's Best Value Colleges One or More per State		-1.197*		-1.137*
		(0.490)		(0.516)
Constant	31.627***	31.823***	45.519***	44.777***
	(0.411)	(1.400)	(0.542)	(1.527)
Sample Size	559	549	559	549
States	51	51	51	51
R^2	0.0251	0.0423	0.0354	0.0562
Adj. R^2	0.0233	0.0311	0.0336	0.0451

Cluster robust standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. All models contain state fixed effects. Stay rate is defined as "Public HS Grads Staying In Home State Public University." College continuation rate is defined as "Total HS Grads Going Anywhere for College"

Table 3 displays the results of the multivariate regression which showed a statistically significant and positive relationship between the needs-based aid per recent public high school graduate both for stay rates and college continuation rates. The coefficients of 1.040 in stay rate in Table 3 above indicates a positive relationship between needs-based aid and the stay rate of recent public high school graduates attending college in one of their home state public institutions at the 99% confidence level. This positive relationship can be interpreted as a $1,000 increase in state needs-based aid per recent public high school graduates is associated with a 1.04 percent point ($p<0.01$) increase in the stay rate of recent public high school graduates in one of their home state public universities. Additionally, a $1,000 increase in state

needs-based aid per recent public high school graduates is associated with a 1.388 percent point ($p<0.05$) increase in the college continuation rate of recent public high school graduates in general either in their home state institution or institutions out of their home state. This model also showed a statistically significant and negative relationship between the needs-based aid per recent public high school graduate both for stay rates and college continuation rates for the independent variable of Kiplinger's best value colleges. The coefficient of -1.197 in stay rate in Table 3 above indicates a negative relationship between needs-based aid and the stay rate of recent public high school graduates attending college in one of their home state public institutions at the 95% confidence level. This negative relationship can be interpreted as a $1,000 increase in state needs-based aid per recent public high school graduates is associated with a 1.197 percent point ($p<0.05$) decrease in the stay rate of recent public high school graduates in one of their home state public universities and a -1.137 percent point ($p<0.05$) decrease in the college continuation rate of recent public high school graduates going to any college both in and out-of-state.

In addition to the statistically significance of these results it is also important to note how much of an effect, from a practical standpoint these results represent. In order to determine these effects, I calculated a Cohen's d value of 5.092 which suggested a substantial effect size for the difference between the mean of the Stay Rate of public high school students with or without Needs-Based Aid. The value of 5.092 indicates a large effect or a substantial difference in Stay Rates when Needs-Based Aid is either present or absent (Cohen 1988). The same Cohen's d calculation was run for determining the effects of the College Continuation Rate and the results were a value of approximately 6.712. This substantial effect size of 6.712

was even larger than the Stay Rate value of 5.092 indicating a large effect or substantial difference in College Continuation Rates when Needs-Based Aid is either present or absent (Cohen 1988).

After running the first regression which included the independent variables of; needs based aid per high school graduate, per capita income, annual average unemployment rate by state, total state funds for higher education expenditures inclusive of capital per public high school graduate, and Kiplinger's best value colleges one or more per state I wanted to test the results of other variables. The first of those additional models excluded both the independent variables of Kiplinger's best colleges along with the total federal funds for higher education expenditures inclusive of capital per public high school graduate while keeping all the other independent variables from the first regression. The results of this model are in Table 5 which showed a statistically significant and positive relationship between the needs-based aid per recent public high school graduate and only stay rates. The coefficients of 1.040 in stay rate remained the same from the first regression which indicated a positive relationship between needs-based aid and the stay rate of recent public high school graduates attending college in one of their home state public institutions at the 99% confidence level. However, the college continuation did not result in a statistically significant result. Another issue which was found with the independent variable of total federal funds for higher education expenditures inclusive of capital per public high school graduate is that the sample size was missing 40 values in the data set. The largest missing values were in the states of; Maine (9) Washington DC (8), Pennsylvania (5), New Hampshire (4), and Wyoming (2).

The independent variable of Kiplinger's best value colleges was the target of the third model run in my analysis as this variable has a mix of different factors included in its calculation so I wanted to see what the model would look like without it while keeping the independent variable of total federal funds for higher education expenditures inclusive of capital per public high school graduate and all the primary model included in the third regression noted in Table 6. This model resulted in both the stay rate and college continuation rates not being statistically significant.

Finally, the model in Table 7 shows a regression that includes all the main model variables with all the other independent variables included like; Kiplinger's best value colleges, total federal funds for higher education expenditures inclusive of capital per public high school graduate. The model resulted in similar results to the model in Table 6 where both the stay rate and college continuation rates were not statistically significant.

Limitations

There is statistical significance that needs-based aid has a relationship with the stay rate of students going to college in their home states. It is important to recall that my research has pointed out many different variables that go into the college decision making process for students and their families. Most of the limitation mentioned below are factors that I was unable to incorporate in how students and their families make a college decision.

First, the ability to control for the relationship of needs-based aid on academically talented students is limited. There was a measure in the IPEDS data by state nor was there a variable like high school grade point average, ACT, or SAT included. Thus, my conclusion that

states with needs-based aid see higher stay rates can only be viewed in the general student context without the ability to conclude if higher academic students are influenced by state needs-based aid. Additionally, merit-based aid which typically is distributed based on high school or academic merit while in high school was not included. This would have been another way to measure how academically talented students are impacted by state needs-based aid. The difficulty in including this variable is the ability to collect the differences between institution merit-based aid from that of state or other forms of merit-based aid. As noted earlier, opponents of merit-based aid see this funding model as benefiting the elite class of society and adding access barrier for high school students from disadvantaged backgrounds (Tierney & Vengas 2009).

A second challenge I found was the ability to disentangle policy effects that influence student decision factors on where they attend college which include; political, economic, and social pressures within each state (Orsuwan & Heck 2009). The challenge of disentangling policy effects also brings about the limitation to control for who qualifies for needs-based aid via FAFSA filers. Research from McKinney and Novak (2015) shows that students delaying college or going part-time were associated with not filing a FAFSA or filing late. Another study by Kantrowitz (2009) found that nearly 2.3 million students that didn't file a FAFSA in 2007-2008 would have qualified for a Pell Grant and that 1.1 million of the non-filers would have likely qualified for a full Pell Grant. While FAFSA filer rates can help to control for the relationship that lowering a student's costs can have on their propensity to enroll in college the inclusion of state variables; per capital income, pell eligible recipents, and public in-state tuition and fees were

included to help control for the relationship of lowering student's costs (Toutkoushian & Hillman 2012).

Another limitation to note is with the variables federal and state funding per state on higher education. Throughout the years of data collected, some states wholly or partially excluded tuition and fees, and some wholly or partially excluded student loan programs. There are concerns with how the public in-state tuition and fee variable might be interacting with the state funding per public college graduate variable. The reason for noting this limitation is that it is difficult to separate the years in the data where states wholly or partially excluded tuition and fees from the reporting to NASBO or the data source used in the report this variable. General funds for years where states didn't include their tuition and fees might be under or overstated depending on the data that was included in the reporting by some of these states.

I didn't include a fourth limitation which is the distance from campus or the number of campuses which students live from a college. Previous studies have documented that having more colleges near a student's home increases the odds of applying to college (Turley 2009), and students who live far away from a university are less likely to enroll (Frenette 2004, 2006). Distance matters for several reasons, but most importantly it has been found to influence first-generation college-bound students which are those students who parents or guardians didn't go to college. First-generation students are also a limitation in this model as it was not accounted in the model directly nor did I include two-year or community colleges as a variable. Previous studies have shown that first-generation students tend to pick community colleges due to costs and geographic considerations in their college decision (Inman & Mayes 1999). However, other studies have also noted that first-generation students will also attend four-year

colleges that are close to home so by not including two-year colleges I didn't eliminated the impact of distance in this model (Saenz & Barrera 2007). While it is a limitation to not include distance from campus, research also shows that living close to campus benefits socioeconomically disadvantaged students because of reduced or savings for tuition, rent, utilities, and driving expenses which have increased due to declines in needs-based financial programs (Turley 2009). So, while it is a limitation, it helps to show that when needs-based aid increase it benefits those living closer to college campuses or first-generation students. The other advantage to living close to home is that students are in closer proximity to a family/guardian or friends support system which is also a limitation. Where a student's parents or guardian goes to college along with cultural norms or family roots influence a student's decision no matter how much needs-based or other forms of federal, state, or institutional aid is available (London 1989, Guiffrida 2005, Desmond Turley 2009).

A student's decision to attend college can also be influenced by academic and non-academic involvement in high school and then in college as well (Thompsett & Knoester 2023). This variable of how involved a student is involved in high school and college represents the fifth limitation in the relationship of needs-based on the stay rate of high school students in all fifty states. In this recent study by Thompsett and Knoester (2023) they note that both sport and non-sport extracurricular participation increases the likelihood of attending college although they found that multiple sports or non-sports participation added additional benefits to attending college. My research was unable to collect extracurricular participation both in sport and non-sports was unable to be attained for high school graduates from 2000 to 2020.

A common limitation with research and the final limitation is that it must assume that time effects for both the states with needs-based aid and those states without needs-based aid. This assumption is that without the needs-based aid that those states with needs-based aid would act like those states who didn't have needs-based aid over the years of 2000 to 2020. The validity of the study depends on how well it does in comparing states with needs-based aid to those without needs-based aid. In order to account for these trends, I used fixed effects and control variables, however, any factors not accounted for may result in omitted variable bias.

Included in my research is the additional technique to strengthen the research against some common limitations. The first of those is the inclusion of the control variables to account for salient factors related to college enrollment. Secondly, my research used fixed-effects estimation which helped to control for multiple observations and estimated effects only for those variables that change across the observations from 2000 through 2020 time period.

Chapter Five: Discussion and Conclusion

Higher education and state governments are feeling a tightening in funding that will likely bring with it continued scrutiny in which programs will receive funding. This increased scrutiny is where the value of my research can be found to help inform policy decision-making (Birnbaum 2000). My research found that the relationship of needs-based aid on both the stay rate and college continuation rates increased the support from previous research that increases in student aid increase multiple measures of student success (Heller 2002, McLendon, Tandberg, & Hillman 2014, Thompsett & Knoester 2023). What these previous studies didn't focus on specifically was the relationship of needs-based aid on public high school students

staying in-state as well as relationship to college continuation rates. However, these studies did find positive correlations between increases in merit-based aid and other various forms of student with student success measures like college continuation, academic success in college, graduation rates in college, and even increasing the number of qualified graduates staying in-state for employment. I wanted to broaden the research to include all 50 states and focus on the relationship of needs-based aid on stay rates and college continuation rates across the country.

In addition to the limitations noted above, making the assumption that all policymakers need is to read this kind of research to make their policy decisions is short-sighted as policymakers are human and have been shown to make decisions using a variety of resources including their own value preferences, societal values, and an assessment of the changing policy environment (Fowler 2000, Baumgartner & Jones 2005). Public funding for higher education financial aid has received increased attention both by policymakers and researchers with some focused on the merit-based aid program which traditionally has benefited higher-academic achieving students who come from higher income families (McLendon, Tandberg, & Hillman 2014). Additionally, there has been recent research on the relationship of extracurricular activities in high school and the college continuation rate (Thompsett & Knoester 2023). From merit-based aid to extracurricular activities the impact of these studies in on college continuation or degree completion. Each of these research topics aims to inform decision making on the drivers of college continuation and graduation rates. Then there are other states that have focused more on increasing their state funding on lower-income families via needs-based aid programs (McLendon, Tandberg, & Hillman 2014). However, these studies

have not focused on the relationship of needs-based aid and the stay rate or recent public high school graduates staying in one of their home state institutions. Empirical information on the relationship of needs-based aid and retaining in-state public high school graduates in one of the in-state public institutions is important to understand for the public funding debate of higher education which focuses on funding for operating expenses versus direct funding to student financial aid (Laderman & Weeden 2020). My results increase the understanding which can help to inform policymakers on what the impacts of changing direct needs-based funding to students in their states will have on keeping those same students in one of their state's public colleges or universities.

Overall the results demonstrate support for the impacts that needs-based aid can have on the stay-rate or keeping public high school graduates in one of a state's public colleges or universities. Both hypotheses were accepted which showed a positive correlation between both the stay rates and the college continuation rate of recent public high school graduates in their home state institutions. Because of this positive correlation between needs-based aid and stay rates, my research can be used for public policies focused on impacting enrollment and fiscal pressures to find a solution in the student aid side of the public funding debate for higher education. If a policymaker is torn between whether to support more funding for operating expenses or student aid, I would recommend funding more needs-based student aid if the goal or issue that this public funding is looking to address for the state is retaining more students to stay in-state for college. The results of my analysis follow the results of similar studies that focused on the relationship of merit-based aid and student migration where increased funding to student aid via merit-based aid reduced student (Heller 2002, McDonough et al. 2007,

Morphew 2005, Orsuwan & Heck 2008). One of the areas which the results of my analysis improve is the understanding of the impacts of needs-based aid, but there is some additional research that is needed to better understand if needs-based aid or merit-based aid or some combination of both might lead to improve college continuation or stay rates for state policymakers.

The challenge which a policymaker faces if they were to use my results as support for funding more student aid is that they would be at odds with the current approach where general operating expenses or funding institutions by the states totaled $92.8 billion in current and constant 2022 dollars which represents 78.5% of all state and local higher education funding (SHEF Report 2022). This shift in funding allocation would reduce the amount of funding policymakers allocate directly to public institutions and instead increase the funding directly to students. While this change might be at odds with current funding, the results tell policymakers and the public institution that there should be more in-state tuition revenue coming as more public in-state pubic high school students should be staying in-state at one of the public institutions. Further research would be needed to determine if the increase in recent public high school graduates would benefit certain kinds of public higher education institutions more than others. However, no matter which institution might benefit more from this change, it could lead to increased competition from in-state institutions to attract recent in-state public high school graduates to their institutions. If states are committed to raising the educational attainment levels of their citizens, then a movement towards more needs-based financial aid policies would be an appropriate public policy to support moving forward.

Policymakers should also be excited about the results of my analysis as it provides opportunity to not only retain more students in their home state public institutions, but it also can help to improve the workforce needs. The statistical significance of the findings in the regression showed a $1,000 increase in state needs-based aid per recent public high school graduates is associated with a 1.04 percent point ($p<0.01$) increase in the stay rate of recent public high school graduates in one of their home state public universities is important from a practical standpoint to policymakers as well. I am using Table 4 for how one could interpret the significance of a 1.04 percent point increase in the stay rate. The first example is that of South Dakota where the mean stay rate is 41.18 and the mean total public high school graduates were 8,528.61. These two figures calculated together show that South Dakota has 3,512.08 students that stay in state for college at public institutions. If policymakers were to apply my model results to the practical impact that a $1,000 increase in state needs-based aid would have on the stay rate of public high school graduates in South Dakota, they should expect to see an additional 88.69 more students staying in South Dakota to attend one of the public institutions. Taking this analysis one step further, the average public in-state tuition and fees in the state of South Dakota from the years of 2000 through 2020 was $6,422. Doing a simple calculation for how much more tuition revenue would be generated with an increase of 88.69 more students staying in South Dakota is $569,567.18. This calculation doesn't consider any other revenue associated with 88.69 more students as there would also be room and board revenue that would add to this return on investment for policymakers. There is also a cost associated with increasing each public high school students needs-based aid by $1,000 which would need to be taken into calculating the return on this kind of increase, but this simple

calculation shows how important the results of my study can be to improving how public funding is allocated and what results could come from this kind of change in public funding for a state like South Dakota. Taking this same return on investment calculation in South Dakota to the largest state of California for total of public high school graduates shows what the practical impact for California would look like when an increase of $1,000 in state needs-based aid is implemented by policymakers. The results are an increase of 4,007.45 more public high school students staying in-state for college. That increase of a 1.04 percent point would bring an additional $25,156,927.70 in tuition and fee revenue for the state of California. Obviously, California is a significantly larger state than South Dakota, but these two examples show that policymakers should focus on funding additional needs-based as one way to increase enrollments at their public institutions.

Throughout my research on the impacts of needs-based aid on both the stay rate and college continuation, there became additional areas of research that can be consider in the future. The first of those was the consideration of how private colleges in each state are impacting the stay rate of public high school graduates. My focus on public institutions was primarily due to limitations with collecting data on these private colleges in each of the state of my study for the years of 2000 to 2020. Another research project that would help to better understand the return on investment would be to expand the analysis to employment data or outcomes of public institutions and how many of these graduates are staying in state for employment after graduating from college. Expanding on my model to include more data on FAFSA filers along with more data on variations in income levels of public high school graduates would help to better explain how the relationship between needs-based aid and stay rate can

be better understood across these variations in needs-based aid as well. Finally, I really wanted to include US News and World Report rankings as a variable in my model to help in understanding if these rankings have a relationship with needs-based aid and the stay rate and college continuation across the United States, but I was unable to collect this data as my email requests were never returned.

References

ACE. American Council on Education. (1949). *The student personnel point of view* (SPPV). Washington, D.C.: American Council on Education (ACE).

Angrist, J. 1993. *"The Effect of Veterans Benefits on Education and Earnings."* Industrial and Labor Relations Review 46 (4): 637-52.

Angrist, J., Lang D., and Oreopoulos P. 2009. *"Incentives and Services for College Achievement: Evidence from a Randomized Trial."* American Economic Journal: Applied Economics 1 (1): 13.

Adkisson, R. & Peach, J. (2008). *Non-resident enrollment and non-resident tuition at land grant colleges and universities.* Education Economics, 16(1), 75-88.

Allen, W., & Jewell, J. (2002). *A backward glance forward: Past, present, and future perspectives on historically black colleges and universities.* Review of Higher Education, 25(3), 241-261.

Alon, S. (2011). *Who benefits most from financial aid? The heterogeneous effect of need-based grants on students' college persistence.* Social Science Quarterly, 92(3), 807-829

Baltagi, B. (2008). Econometric analysis of panel data (4th ed.). John Wiley & Sons.

Baumgartner, F. & Jones, B. (2005). *The Politics of Attention: How Government Prioritizes Problems*. Chicago: University of Chicago Press.

Becker, G. (1983). *A theory of competition among pressure groups for political influence*. The Quarterly Journal of Economics, 98, 371-400.

Bennett, L. (1984). Before the Mayflower: A history of Black America; the classic account of the struggles and triumphs of Black American. New York: Penguin.

Berger, M. & Kostal, T. (2002*). Financial resources, regulation, and enrollment in U.S. public higher education.* Economics of Education Review, 21(2), 101-110.

Bertrand, M., Duflo, E., & Mullainathan, S. (2004). *How much should we trust differences-in-differences estimates?* The Quarterly Journal of Economics, U9(1), 249-275

Bettinger, E. (2004). *"How Financial Aid Affects Persistence." In College Choices: The Economics of Where to Go, When to Go, and How to Pay For It*, edited by Caroline M. Hoxby, 207-38. Chicago: University of Chicago Press.

Bettinger, E. (2015). *Need-Based Aid and College Persistence: The Effects of the Ohio College Opportunity Grant.* Educational Evaluation and Policy Analysis, 37(1S), 102S-119S.

Betts J. & McFarland, L. (1995). *Safe port in a storm: The impact of labor market conditions on community college enrollments.* Journal of Human Resources, 30(4), 741-765.

Billings, R. D. (2012). *The homestead act, pacific railroad act and morrill act.* Northern Kentucky Law Review, 39(4), 699-736.

Birnbaum, R. (2000). *Policy scholars are from Venus: Policy makers are from Mars. The Review of Higher Education*, 23(2), 119-132.

Board of Governors of the Federal Reserve System (US) (2023). Student Loans Owned and Securitized [SLOAS], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/SLOAS, July 7, 2023

Bok, D. C. (2003). *Universities in the marketplace*: The commercialization of higher education. Princeton, NJ: Princeton University Press.

Bound, J., and Turner S. 2002. *"Going to War and Going to College: Did World War II and the G.I. Bill Increase Educational Attainment for Returning Veterans?"* Journal of Labor Economics 20 (4): 784-815.

Brennan, J., Durazzi, N., & Sene, T. (2013). *Things we know and don't know about the Wider Benefits of Higher Education: A review of the recent literature.* London, UK: London School of Economics and Political Science (LSE).

Brown, M., Donahoo, S., & Bertrand, R. (2001). *The black college and the quest for educational opportunity.* Urban Education, 36(5), 553-571.

Buss, c., Parker J., & Rivenburg, J. (2004). *Cost, quality, and enrollment demand at liberal arts colleges.* Economics of Education Review, 23(1), 57-65.

Carnevale, A., & Rose, S. (2015). *The economy goes to college: The hidden promise of higher education in the post-industrial service economy*. Washington, D.C.: Georgetown University Center on Education and the Workforce.

Castleman, B., and Long. 2013 B. "Looking Beyond Enrollment: The Causal Effect of Need-Based Grants on College Access, Persistence, and Graduation." National Bureau of Economic Research (NBER) Working Paper 1930

Chan, R. (2016). *Understanding the Purpose of Higher Education: An Analysis of the Economic and Social Benefits for Completing a College Degree.* Journal of Education Policy, Planning and Administration. Vol. 6, Issue 5.

Chen, R., & St. John, E. P. (2011). *State Financial Policies and College Student Persistence: A National Study*. The Journal of Higher Education, 82(5), 629–660.

"Cincinnatus," No. 34, New Hampshire Patriot, Apr. 16, 1821; No. 35, Apr. 23, 1821.

Cohen, J. (1988). Statistical Power Analysis for the Behavioral Sciences (2nd ed.) Lawrence Erlbaum Associate.

Conklin, K & Curran, B. (2005). Action agenda for improving America's high schools. Sponsored by Achieve, Inc., and the National Governors Association: https://www.achieve.org/publications/2005-summit-action-agenda

Cooke, T., & Boyle, P. (2011). *The Migration of High School Graduates to College.* Educational Evaluation and Policy Analysis, 33(2), 202-213.

Cordrary, R. (2023). Dear Colleague Letter. Washington, DC: U.S. Department of Education, Office for Civil Rights.

College Savings Plan Network (CSPN) 2020. https://www.collegesavings.org/529-plan-data

Coughlin, C, & Erekson, O. (1986). *Determinants of state aid and voluntary support of higher education*. Economics of Education Review, 5, 179-190.

Dellas, H. & Sakellaris, P. (2003). *On the cyclicality of schooling:* Theory and evidence, Oxford Economic Papers, 55, 148-172.

Department of Education (2023). *The Federal Role in Education:* https://www2.ed.gov/about/overview/fed/role.html July 8th, 2023.

DesJardins, S., & Bell, A. (2006). *Using economic concepts to inform enrollment management*. New Directions for Institutional Research, 2006(132), 59-74.

Desmond, M. & Turley R. (2009). "The Role of Familism in Explaining the Hispanic-White College Application Gap." Social Problems 56(2):311–34.

Douglas-Gabriel, Danielle; Stein, Jeff (August 24, 2022). "Biden to cancel up to $10,000 in student debt for most borrowers and $20,000 for Pell recipients". The Washington Post.

Doyle, W., Delaney, J., & Naughton, B. (2004*). Institutions Amplifying State Policy: How Public College Award Institutional Aid.* Change, 36(4), 36–41.

Doyle, W. (2006). *Adoption of Merit-Based Student Grant Programs: An Event History Analysis.* Educational Evaluation and Policy Analysis, 28(3), 259-285.

Domina, T., Pharris-Ciurej, N., Penner, A. M., Penner, E. K., Brummet, Q., Porter, S. R., & Sanabria, T. (2018). *Is Free and Reduced-Price Lunch a Valid Measure of Educational Disadvantage?* Educational Researcher, 47(9), 539–555.

Dynarski, S. (2000). *Hope for Whom? Financial Aid for the Middle Class and Its Impact on College Attendance.* National Tax Journal, *53*(3), 629–661

Dynarski, S. (2003). *"Does Aid Matter? Measuring the Effect of Student Aid on College Atten dance and Completion."* American Economic Review 93 (1): 279

Dynarski, S., & Scott-Clayton, J. (2013). *Financial Aid Policy: Lessons from Research*. *The Future of Children*, *23*(1), 67–91.

Education Amendments Act of 1972, 20 U.S.C. §§1681 - 1688.

Elliott, W., III, Song, H-a., & Nam, I. (2013). *Small-dollar children's savings accounts, income, and college outcomes* (CSD Working Paper No. 13-06). St. Louis, MO: Washington University, Center for Social Development.

Fack, G., & Grenet, J. (2015). Improving College Access and Success for Low-Income Students: Evidence from a Large Need-Based Grant Program. American Economic Journal: Applied Economics, 7(2), 1–34.

Fine, B. (1954). "Russia Is Overtaking U.S. in Training of Technicians." New York Times, 7 Nov. 1954: 1, 80.

Flemming, A. (1960). *The Philosophy and Objectives of The National Defense Education Act.* The Annals of the American Academy of Political and Social Science, 327, 132–138.

Frees, E. (2004). Longitudinal and panel data: Analysis and applications in the social sciences. Cambridge University Press.

Frenette, Marc. 2004. "Access to College and University: Does Distance to School Matter?" Canadian Public Policy 30(4):427–43.

Frenette, M. (2006). "Too Far to Go On? Distance to School and University Participation." Education Economics 14(1):31–58.

Fowler, C. (2000). *Policy studies for education leaders*. Upper Saddle River, NJ: Prentice Hall.

Garza, A. N., & Fullerton, A. S. (2018). *Staying Close or Going Away: How Distance to College Impacts the Educational Attainment and Academic Performance of First-generation College Students*. Sociological Perspectives, 61(1), 164–185.

Goldin, & Katz, L. (1999). *The Shaping of Higher Education: The Formative Years in the United States, 1890 to 1940.* The Journal of Economic Perspectives, 13(1), 37–62.

Goldrick-Rab, S., Harris D., Kelchen R., and Benson J. 2012. *"Need-Based Financial Aid and College Persistence: Experimental Evidence from Wisconsin."* Institute for Research on Poverty (IRP) Discussion Paper 1393-12

Guiffrida, D. (2005). "To Break Away or Strengthen Ties to Home: A Complex Issue for African American College Students Attending a Predominantly White Institution." Equity & Excellence in Education 38(1):49–60.

Hagedorn, L. S., Mensel, R. F., Friedel, J. N., Lui, J., Smith, D., Tarrant, M., Kilgo, R., Clark, C., & Katsinas, S. G. (2018). *The Growing Impact of New Pell Grant Funding*: 217 A Statewide Profile of Iowa's Community Colleges.

Hansen, W. (1983). *Impact of Student Financial Aid on Access.* Proceedings of the Academy of Political Science, 35(2), 84-96.

Hanson, M.(2023). “College Savings Statistics”. EducationData.org, https://educationdata.org/college-savings-statistics

Heller, D. (2002). Exchange: Is Merit-Based Student Aid Really Trumping Need-Based Aid? Another View. Change, 34(4), 6-8.

Heller, D. & Marin, P. (Eds.). (2002). *Who should we help? The negative social consequences of merit scholarships.* Cambridge, MA: The Civil Rights Project at Harvard University.

Herbold, H. (1994). *Never a Level Playing Field: Blacks and the GI Bill.* The Journal of Blacks in Higher Education, 6, 104–108.

Higher education act of 1965 section-by-section analysis. (1965). Washington, D.C.:U.S. Department of Health, Education, and Welfare, Office of Education.

Hoenack, S. (1982). *Pricing and efficiency in higher education*. The Journal of Higher Education, 53, 403.

Holden, S. (2002). SAVING FOR COLLEGE WITH 529 PLANS. Proceedings. Annual Conference on Taxation and Minutes of the Annual Meeting of the National Tax Association, 95, 89–98.

Hout, M. (2012). *Social and economic returns to college education in the United States*. Annual Review of Sociology, 38(1), 379-400.

H.R. 2055 — 103rd Congress: Student Loan Reform Act of 1993.” www.GovTrack.us. 1993. March 4, 2023.

Inman, E. and Larry M. 1999. “The Importance of Being First: Unique Characteristics of First Generation Community College Students.” Community College Review 26(4):3–22.

Jaquette, O., & Curs, B. (2015). *Creating the Out-of-State University: Do Public Universities Increase Nonresident Freshman Enrollment in Response to Declining State Appropriations?* Research in Higher Education, 56(6), 535–565.

Johnson, E. (1983). *“The Dartmouth College Case: The Neglected Educational Meaning.”* Journal of the Early Republic, vol. 3, no. 1, pp. 45–67.

Kaiser, D. (2006). *The Physics of Spin: Sputnik Politics and American Physicists in the 1950s.* Social Research, 73(4), 1225–1252.

Kantrowitz, M. (2009). Analysis of why some students do not apply for financial aid. Student Aid Policy Analysis.

Kelchen, R., & Webber, D. (2018). *Examining the Interstate Mobility of Recent College Graduates.* Educational Researcher, 47(3), 213–215.

Laderman, S., & Weeden, D. (2020). *State higher education finance fiscal 2019*. State Higher Education Executive Officers Association.

Lee Jr, J. (2013). *Land-grant but unequal.* Association of Public and Land-Grant Universities. September Report No. 3000- PB1.

Lee, J. (2014). *Merit-based aid, college affordability, and student success* (Doctoral dissertation, Vanderbilt University).

Lee, M. (2019). *Losing our Minds: Brain Drain Across the United States.* United States Congress, Joint Economics Committee. https://www.jec.senate.gove/public/inxex.cfm/republicans/2019/4/losing-our-minds-brain-drain-across-theunited-states.

Leslie, L., & Brinkman, P. (1987). *Student Price Response in Higher Education: The Student Demand Studies.* The Journal of Higher Education, 58(2), 181–204.

Levine, & Levine, A. (2011). *Who Said the Government Can't Do Anything Right? The World War II GI Bill, the Growth of Science, and American Prosperity.* American Journal of Orthopsychiatry, 81(2), 149–156.

London, H. (1989). "Breaking Away: A Study of First-generation College Students and Their Families." American Journal of Education 97(2):144–70.

LOONEY, A., & YANNELIS, C. (2015*). A Crisis in Student Loans? How Changes in the Characteristics of Borrowers and in the Institutions, They Attended Contributed to Rising Loan Defaults.*

Ma, J. & Matea P. (2021). *Trends in College Pricing and Student Aid 2021*, New York: College Board.

Ma, J., Pender, M., & Welch, M. (2019). *Education pays 2019: The benefits of higher education for individuals and society*. The College Board.

McBain, L. (2011*). State Need-Based and Merit-Based Grant Aid: Structural Intersections and Recent Trends.* American Association of State Colleges and Universities. 1-7.

McDonough, P., Calderone, S., & Purdy, W. (2007). *State grant aid and is effects on. students' college choices*. The Western Interstate Commission for Higher Education.

McDowell G. (2002). Land-Grant Universities and Extensions into the 21st Century: Renewing the Covenant, WASHINGTON STATE UNIVERSITY COOPERATIVE EXTENSION CONFERENCE 16.

McHugh, R. & Morgan, J. (1984). *The determinants of interstate student migration: A place-to-place analysis.* Economics of Education Review, 3(4), 269-278.

McKinney, L., & Novak, H. (2015). *FAFSA Filing Among First-Year College Students: Who Files on Time, Who Doesn't, and Why Does it Matter?* Research in Higher Education, 56(1), 1–28.

McMahon, W. (2009*). Higher learning, greater good: The private and social benefits of higher education*. Johns Hopkins University Press.

McPherson, M., & Schapiro, M. (1998). *Merit Aid: ITS PLACE IN HISTORY AND ITS ROLE IN SOCIETY. In The Student Aid Game: Meeting Need and Rewarding Talent in American Higher Education* (Vol. 120, pp. 107–115).

Miao, K. (2012). Performance-Based Funding of Higher Education: A Detailed Look at Best Practices in 6 States. Center for American Progress

Morphew, C. (2005). *Student migration: Relief valve for state enrollment and demographic pressures*. Paper published as part of the Policy Insights Series. Issued by the Western Interstate Commission for Higher Education, Boulder, Colorado. May

Morrill Act, Ch. 130, 12 Stat. 503 (1862) (codified as amended at 7 U.S.C. § 301

Mullin, C. (2013). *Past, Present, and Possibilities for the Future of the Pell Grant Program.* Journal of Education Finance, 39(1), 3–14.St

Ness, E. (2010). *The Politics of Determining Merit Aid Eligibility Criteria: An Analysis of the Policy Process.* The Journal of Higher Education, 81(1), 33-60.

Ness, E., & Noland, B. (2007). *Targeted merit aid: Implications of the Tennessee education lottery scholarship program.* Journal of Student Financial Aid, 37(1), 4.

Nixon, R. (1970). *Special Message to the Congress on Higher Education* (Public Papers of the Presidents, March 19, 1970), 276.

Orsuwan, M., & Heck, R. (2009). *Merit-Based Student Aid and Freshman Interstate College Migration: Testing a Dynamic Model of Policy Change*. Research in Higher Education, 50(1), 24–51.

Perna, L., & Titus, M (2004). *Understanding the differences in the choice of college attended: The role of state public policies.* Review of Higher Education, 27(4),507-525.

Peterson, P. (1995). The price of federalism. Washington, D.C. Brookings Institution. https://www.brookings.edu/book/the-price-of-federalism/

Pingel, S (2017). *Policy Snapshot: Need-based state financial aid*. Denver, CO. Education Commission of States. 1-6.

Redd, K. (1998). *Historically black colleges and universities: Making a comeback.* New Directions for Higher Education, 26(2), 33-43.

Rubin, R. (2011). *The Pell and the Poor: A Regression-Discontinuity Analysis of On-Time College Enrollment.* Research in Higher Education, 52(7), 675–692.

Saenz, V. and Barrera D. (2007). “What We Can Learn from UCLA’s ‘First in My Family’ Data.” Recruitment and Retention in Higher Education 21(9):1–3.

Selingo, J. (2016). *There is life after college: What parents and students should know about navigating school to prepare for the jobs tomorrow*. New York, NY: William Morrow.

Shin, J., & Milton, S. (2008). *Student Response to Tuition Increase by Academic Majors: Empirical Grounds for a Cost-Related Tuition Policy.* Higher Education, 55(6), 719-734.

Singell, L., Waddell, G., & Curs, B. (2006). *HOPE for the Pell? Institutional Effects in the Intersection of Merit-Based and Need-Based Aid.* Southern Economic Journal, 73(1), 79-99.

Sjoquist, D., & Winters, J. (2015). *State merit-based financial aid programs and college attainment.* Journal of Religious Science, 55(3), 364-390.

Spellings Commission (2006). *A test of leadership charting the future of U.S. higher education: A report of the commission appointed by secretary of education Margaret Spellings.* Washington, D.C.: U.S. Department of Education.

Stanley, M. (2003). "College Education and the Midcentury GI Bills." Quarterly Journal of Eco nomics 118 (2): 671-7.

St. John, E., Paulsen, M., & Carter, D. (2005). *Diversity, college costs, and postsecondary opportunity: An examination of the financial nexus between college choice and persistence for African Americans and whites.* The Journal of Higher Education 76(5), 545-569.

Suspitsyna, T. (2012). *Higher education for economic advancement and engaged citizenship: An analysis of the U.S. Department of Education Discourse.* Journal of Higher Education, 83(1), 49-72.

Taylor, F. (1911). The Principles of Scientific Management. Mineola, New York: Dover Publications, Inc.

Thelin, J. (2019). A history of American higher education (3rd ed.). Baltimore, MD: Johns Hopkins University Press.

Tompsett J., Knoester C. (2023). *Family socioeconomic status and college attendance: A consideration of individual-level and school-level pathways.* PLoS ONE 18(4): e0284188.

Tierney, W., & Venegas, K. (2009*). Finding money on the table: Information, financial aid, and access to college.* The Journal of Higher Education, 80(4), 363-388.

Tilak, J. (2008). Higher education: A public good or a commodity for trade? Prospects, 38, 449-466.

Toutkoushian, R., & Shafiq, M. (2010*). A Conceptual Analysis of State Support for Higher Education: Appropriations versus Need-Based Financial Aid.* Research in Higher Education, 51(1), 40–64.

Toutkoushian, R., & Hillman, N. (2012). *The impact of state appropriations and grants on access to higher education and outmigration.* The Review of Higher Education, 36(1). 51-90

Turley, R. (2009). "College Proximity: Mapping Access to Opportunity." Sociology of Education 82(2):126–46.

Washburn 2005 Wilson, R. (1990*). Can black colleges solve the problem of access for black students?* American Journal of Education, 98(4), 443-457.

Weerts D., & Ronca, J.. (2006). *Examining Differences in State Support for Higher Education: A Comparative Study of State Appropriations for Research I Universities.* The Journal of Higher Education, 77(6), 935-967.

Zhang, L., & Ness, E. (2010). *Does State Merit-Based Aid Stem Brain Drain?* Educational Evaluation and Policy Analysis, 32(2), 143-165.

U.S. Department of Education (2016). Institute of Education Sciences, National Center for Education Statistics (NCES).

U.S. Joint Committee on Taxation, May 26, 2001. The provisions of EGTRRA will expire on December 3 1, 2010. Unless the law is extended by Congress, the federal tax treatment of 529 Plans will revert to its status prior to January 1, 20

Veysey, L.. (1965). The Emergence of the American University. Chicago: The University of Chicago Press.

Appendix: Supplemental Tables

Table 4. Descriptive Statistics by State

	Stay Rate		College Continuation Rate		Total Public HS Graduates	
State	Mean	S.D.	Mean	S.D.	Mean	S.D.
Alabama	34.86	2.91	41.39	2.72	42438.82	4893.51
Alaska	24.96	4.41	42.06	5.00	7680.18	574.86
Arizona	23.44	1.19	29.37	1.68	58567.91	10863.23
Arkansas	37.50	2.75	43.07	2.69	29295.73	2029.73
California	27.09	2.70	33.75	4.08	385331.50	47186.77
Colorado	35.46	1.73	49.49	2.04	48857.45	6604.25
Connecticut	27.30	1.20	62.97	3.71	36376.64	2718.45
Delaware	31.53	11.76	55.00	11.92	7863.00	1114.61
District of Columbia	15.60	3.66	67.46	5.01	3320.54	315.66
Florida	44.71	10.65	52.13	11.26	150703.30	26926.16
Georgia	42.18	3.65	53.44	3.69	87324.00	18190.59
Hawaii	21.48	2.32	46.29	4.65	11013.91	444.62
Idaho	25.48	1.83	36.93	1.53	17257.73	1389.57
Illinois	27.39	2.75	46.25	1.68	131530.50	9970.23
Indiana	47.98	3.43	55.83	3.43	63381.18	5744.09
Iowa	31.72	1.29	40.24	1.56	33843.27	558.63
Kansas	32.30	3.21	41.70	3.25	31152.73	1374.48
Kentucky	39.16	2.53	46.06	2.45	41297.55	3656.73
Louisiana	51.45	3.57	58.18	3.24	38101.82	3209.52
Maine	29.22	2.83	51.11	4.12	13078.09	682.33
Maryland	21.03	1.24	46.10	2.14	56140.64	3923.27
Massachusetts	37.68	2.05	64.32	3.80	62739.91	514.80
Michigan	40.09	1.45	46.99	1.89	102301.00	6913.99
Minnesota	30.71	1.53	50.25	3.25	58722.36	1280.71
Mississippi	23.48	2.92	28.85	3.24	26006.45	2291.08
Missouri	31.86	2.02	42.18	2.07	59504.55	3318.51
Montana	35.81	1.99	47.37	1.41	9968.09	608.09
Nebraska	39.88	1.53	50.53	1.31	20358.36	641.99
Nevada	33.42	5.82	44.39	6.86	21077.45	5811.84
New Hampshire	23.32	1.65	54.90	3.09	13666.80	1063.09
New Jersey	24.68	1.90	56.71	2.35	90707.45	8327.43
New Mexico	29.09	3.57	39.00	4.14	18965.27	1252.12
New York	42.68	2.06	58.57	2.64	170500.50	17258.34
North Carolina	37.95	2.87	44.69	2.26	86832.55	16059.01
North Dakota	40.66	3.84	53.69	3.15	7277.27	636.31
Ohio	42.66	2.16	52.12	2.50	119238.20	4569.85
Oklahoma	32.56	3.60	37.93	3.72	39383.27	4446.63
Oregon	24.30	1.83	35.38	2.18	34751.36	3095.57
Pennsylvania	41.91	1.66	53.96	1.61	125226.00	5952.36
Rhode Island	27.79	3.49	53.56	4.61	9544.81	534.63
South Carolina	37.06	3.18	44.15	3.24	39505.36	6974.67
South Dakota	41.18	2.45	56.69	2.27	8528.81	370.93
Tennesse	35.65	3.47	46.30	3.50	55886.18	9301.42
Texas	29.96	2.52	36.28	3.00	280347.40	49826.93
Utah	34.33	5.83	37.90	6.23	33987.18	5428.55
Vermont	23.25	1.79	53.12	3.57	6662.18	549.47
Virginia	35.16	1.52	47.56	1.98	78344.27	8662.62
Washington	27.98	4.87	39.14	6.18	64617.45	5380.41
West Virginia	40.87	1.72	46.58	2.10	17752.60	746.55
Wisconsin	39.16	2.49	50.62	3.13	61822.09	2116.12
Wyoming	14.94	1.96	28.44	2.52	5729.18	305.56
Total	32.78	8.70	47.06	9.61	59460.11	69667.68

Table 5. Multivariate Regression Results without Kiplinger's & Federal Funds

Independent Variables	Stay Rate (1)	Stay Rate (2)	College Continuation Rate (3)	College Continuation Rate (4)
Needs-based aid per HS Graduate in $1000s	1.040**	1.076*	1.388**	1.391
	(0.368)	(0.523)	(0.485)	(0.698)
Per Capita Income in $1000s		-0.022		0.013
		(0.042)		(0.045)
Annual Average Unemployment Rate by State		0.051		-0.024
		(0.122)		(0.124)
Total State Funds for Higher Ed. Expenditures Inclusive of Capital Per Public HS Graduate		0.029		0.018
		(0.016)		(0.011)
Constant	31.627***	30.789***	45.519***	43.795***
	(0.411)	(1.272)	(0.542)	(1.449)
Sample Size	559	549	559	549
States	51	51	51	51
R^2	0.0251	0.0394	0.0354	0.0441
Adj. R^2	0.0233	0.0324	0.0336	0.0371

Cluster robust standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. All models contain state fixed effects. Stay rate is defined as "Public HS Grads Staying In Home State Public University." College continuation rate is defined as "Total HS Grads Going Anywhere for College"

Table 6. Multivariate Regression Results without Kiplinger's Best Value Colleges

Independent Variables	Stay Rate (1)	Stay Rate (2)	College Continuation Rate (3)	College Continuation Rate (4)
Needs-based aid per HS Graduate in $1000s	1.040**	1.045	1.388**	1.289
	(0.368)	(0.540)	(0.485)	(0.689)
Per Capita Income in $1000s		-0.022		0.026
		(0.047)		(0.048)
Annual Average Unemployment Rate by State		0.073		0.012
		(0.122)		(0.131)
Total Fed. Funds for Higher Ed. Expenditures Inclusive of Capital Per Public HS Graduate		-0.022		-0.043
		(0.051)		(0.052)
Total State Funds for Higher Ed. Expenditures Inclusive of Capital Per Public HS Graduate		0.029		0.018
		(0.017)		(0.018)
Constant	31.627***	31.069***	45.519***	43.127***
	(0.411)	(1.293)	(0.542)	(1.448)
Sample Size	559	519	559	519
States	51	51	51	51
R^2	0.0251	0.0378	0.0354	0.0501
Adj. R^2	0.0233	0.0284	0.0336	0.040951

Cluster robust standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. All models contain state fixed effects. Stay rate is defined as "Public HS Grads Staying In Home State Public University." College continuation rate is defined as "Total HS Grads Going Anywhere for College"

Table 7. Multivariate Regression Results with Kiplinger's & Fed Funds

Independent Variables	Stay Rate (1)	Stay Rate (2)	College Continuation Rate (3)	College Continuation Rate (4)
Needs-based aid per HS Graduate in $1000s	1.040**	1.065	1.388**	1.314
	(0.368)	(0.541)	(0.485)	(0.689)
Per Capita Income in $1000s		-0.022		0.026
		(0.047)		(0.049)
Annual Average Unemployment Rate by State		0.065		0.003
		(0.121)		(0.130)
Kiplinger's Best Value Colleges One or More per State		-1.166*		-1.495*
		(0.543)		(0.573)
Total Fed. Funds for Higher Ed. Expenditures Inclusive of Capital Per Public HS Graduate		-0.000		-0.000
		(0.000)		(0.000)
Total State Funds for Higher Ed. Expenditures Inclusive of Capital Per Public HS Graduate		0.000		0.000
		(0.000)		(0.000)
Constant	31.627***	32.034***	45.519***	44.364***
	(0.411)	(1.389)	(0.542)	(1.502)
Sample Size	559	519	559	519
States	51	51	51	51
R^2	0.0251	0.0423	0.0354	0.0562
Adj. R^2	0.0233	0.0311	0.0336	0.0451

Cluster robust standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. All models contain state fixed effects. Stay rate is defined as "Public HS Grads Staying In Home State Public University." College continuation rate is defined as "Total HS Grads Going Anywhere for College"