View metadata, citation and similar papers at core.ac.uk

brought to you by CORE

provided by Aquila Digital Community

The University of Southern Mississippi

The Aquila Digital Community

Dissertations

Fall 12-2016

Factors Influencing Accessibility to American Public Higher Education

Angela Leanne Bryan
University of Southern Mississippi

Follow this and additional works at: https://aquila.usm.edu/dissertations

 Part of the Community College Leadership Commons, and the Higher Education Commons

Recommended Citation

Bryan, Angela Leanne, "Factors Influencing Accessibility to American Public Higher Education" (2016). *Dissertations*. 884.
https://aquila.usm.edu/dissertations/884

This Dissertation is brought to you for free and open access by The Aquila Digital Community. It has been accepted for inclusion in Dissertations by an authorized administrator of The Aquila Digital Community. For more information, please contact Joshua.Cromwell@usm.edu.

FACTORS INFLUENCING ACCESSIBILITY TO AMERICAN PUBLIC HIGHER EDUCATION

by

Angela Alexander Bryan

A Dissertation
Submitted to the Graduate School
and the Department of Political Science,
International Development, and International Affairs
at The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

Approved:

_____
Dr. Shahdad Naghshpour, Committee Chair
Professor, Political Science, International Development, and International Affairs

_____
Dr. Joseph St. Marie, Committee Member
Assistant Professor, Political Science, International Development, and International Affairs

_____
Dr. Robert Pauly, Committee Member
Associate Professor, Political Science, International Development, and International Affairs

_____
Dr. Stephanie Burdine King, Committee Member
Associate Professor, Educational Leadership, Mississippi State University

_____
Dr. Karen S. Coats
Dean of the Graduate School

December 2016

COPYRIGHT BY

Angela Alexander Bryan

2016

Published by the Graduate School

THE UNIVERSITY OF SOUTHERN MISSISSIPPI®

ABSTRACT

FACTORS INFLUENCING ACCESSIBILITY TO AMERICAN

PUBLIC HIGHER EDUCATION

by Angela Alexander Bryan

December 2016

Since their inception in the early 1900s, community colleges have been about making higher education accessible. While their initial purpose was to overcome the geography barrier to higher education, the mission of community colleges and higher education on the whole has expanded over time to mitigate other barriers to higher education to include gender, race, religion, and socioeconomic barriers. As public support for higher education has changed over time, institutions have had to change their tuition and fee structure to make up the budget shortfall created by the decreases in public funding. How have these changes impacted accessibility to public higher education, and community colleges in particular?

This paper addresses the question of accessibility from a student perspective, an institutional perspective, and an international perspective. Regression analysis and descriptive statistics are used to determine factors that influence accessibility to public higher education.

ACKNOWLEDGMENTS

I wish to thank my committee chair, Dr. Shahdad Naghshpour, for his willingness to guide me through this dissertation and his infinite patience with me in all things "quantitative." I would also like to thank my committee members, Dr. J.J. St. Marie, Dr. Robert Pauly, and Dr. Stephanie Burdine King, for their feedback and encouragement through this process. Each provided much needed encouragement and support to see me through to the end.

DEDICATION

This dissertation is dedicated to:

My parents, Robert and Billie Faye Alexander, for their unconditional love, for making education a requirement and not an option, and for the inspiration to begin this journey.

My children, Alex Bryan and Kate Bryan, for their encouragement, "good behavior," and their unwavering belief that I would indeed finish.

My dearest friend, Sheila Smith, for seeing me through the hardest part of this journey and giving me the will to finish.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS

ASVAB	Armed Forces Vocational Aptitude Battery
IPEDS	Integrated Postsecondary Education Data System
NCES	National Center for Education Statistics
NLSY	National Longitudinal Survey of Youth
OECD	Organisation for Economic Co-operation and Development

CHAPTER I - INTRODUCTION

The American Public Community College

Over 100 years ago, a grass roots effort began with a purpose of increasing accessibility to higher education in the United States of America. The American community college system was created to eliminate barriers to higher education. Whether the barriers were geographic, social, or economic, local communities started community colleges with the help and support of states and the federal government to minimize these barriers for citizens. Over the past several decades, various pieces of federal legislation sought to ease the financial burdens of students in conjunction with state support of community colleges. However, as state budget priorities have shifted away from financial support of public higher education, community college budgets have sought to make up the short fall in appropriations with higher tuition and fees for students.

The purpose of this study is to look at the impact of funding changes on accessibility to higher education at community colleges. During the 1970s, community colleges received the majority of their funding from state and local appropriations making tuition and fees less important to the overall college budget. However, as state appropriations decrease, college budgets rely more heavily on tuition and fees from students. Students in turn rely heavily on student aid to pay tuition. But what effect does this high-tuition, high-aid model have on accessibility? Are there potential students who simply opt not to pursue higher education because of lack of resources or inability to qualify for aid?

This study will seek to update Rouse's 1994 study using more recent data available through the National Longitudinal Survey Youth Cohort (NLSY). The study uses a multinomial logistic (MNL) model with the dependent variable as the dichotomous choice of starting at a two-year college. The 1994 study finds that students who attend community colleges are more likely to be first-generation college students, nonblack, and have lower levels of measured scholastic abilities. Also, changes in overall college tuition mainly affect two-year college enrollments.

Background

Prior to the 20th century, higher education was viewed as mainly a private good. While there were some publicly funded universities, the purpose of higher education was primarily to offer training for professions like law, medicine, and clergy. And while members of these professions served the public by facilitating the justice system, healing the sick, and saving souls, the education of these professionals was thought to be the responsibility of their families. We see this theme reflected in Adam Smith's *Wealth of Nations* where he distinguished basic education as a public good and professional education as a private good (Smith 1976). However, the mid-1800s in the United States saw the beginnings of a shift in public opinion. The technological advances and complexities of a changing world led to the need for business and industry to have a workforce with capabilities above that of a basic education.

Higher education was seen as a necessity to drive the expansion of business and industry, and the key to the wealth of the United States was not just in the raw materials but in the human capital potential as yet unexplored and untapped. The university system at the beginning of the 20th century was well established but even for those with the

means to afford a higher education, geography was often a barrier that could not be easily overcome. The birth of publicly funded community colleges in various states was designed to solve the geographic barrier to higher education and offer an opportunity to those living in remote parts of the country unable to relocate to a university.

However, a more dramatic shift in public focus began in earnest in the mid-20th century. In 1947 after World War II, President Harry S. Truman charged the nation with making higher education the means by which citizens could be "enabled and encouraged to carry his education, formal and informal, as far as his native capacities permit…. Education that liberates and ennobles must be made equally available to all. Justice to the individual demands this; the safety and progress of the Nation depend upon it" (The President's Commission on Higher Education 1947, 101). As a result of this charge and the national emphasis on public funding of higher education, the public view of higher education shifted from that of a private good to more of a public good. State and federal funding for public higher education institutions increased over time in order to make higher education more accessible to those Americans who would make a better educated workforce and grow the economy.

Public higher education would see further public investment through the Higher Education Act of 1965 which sought to minimize financial barriers to higher education. With the initial passage in 1965 and subsequent reauthorizations in later years, federally funded grants and federally-insured student loans were available as instruments designed to make education more affordable for students at the institutions of their choosing, increasing educational opportunity for economically disadvantaged students.

As part of this shift, the societal expectation has been that publicly funded institutions will pursue a mission that serves the "public good" while there is no expectation of private institutions to do so. Public higher education institutions, and in particular community colleges, have been about providing access to higher education for those that would not otherwise be able to attend either due to cost, geographic proximity, or other limiting factors (Barrano and Traut 2012; Cohen, Brawer, and Kisker 2014; Grubb 1989; Kane and Rouse 1999; Rouse 1994).

This national investment in human capital has been viewed as a success, propelling the United States of America to be the largest economy in the world and positioning the nation as a world superpower. The recognition of our successful higher education system has led developing countries around the world to make similar commitments to public education at all levels, but for those wishing to develop strong economies, these nations have made similar investments in higher education, with universities and community and technical colleges alike. The Republic of South Korea is an example of the strides made in education. "Two generations ago, Korea was counted among the poorest countries, and its educational standards were well below the OECD {Organisation for Economic Co-operation and Development} average. In 2007, ninety-seven percent of twenty-five- to thirty-year-old Koreans have completed secondary education, by far the highest rate among OECD countries, and its figures for higher education are equally impressive (Docampo 2007).

Public funding for higher education, and state funding in particular, has changed significantly over time. As reported by Cohen, Brawer, and Kisker (2014), in 1980 average public funding from state appropriation and local sources was 73% of

community college revenue. Since that time, state funding for public higher education has been in a steady decline to the point that the public funding portion of the budgets of public higher education institutions more closely resemble the budgets of their private higher education counterpart institutions. By 2010, average public funding of community colleges had shrunk to 48% with only 30% coming from state appropriations (Cohen, Brawer and Kisker 2014, 153).

Along with this decline in state appropriations has been the inevitable rise in tuition and fees, placing a greater burden on students to pay for higher education. In response, students with the least means to pay for the high cost of higher education have turned to student aid, making the federal government a *de facto* contributor to public higher education budgets. Yet even the type of student aid available to economically disadvantaged students has changed from need-based grants which do not need to be paid back to loans, which must be paid back.

Exploring the consequences of decreased funding of community colleges is useful considering that community colleges educate 45% of all undergraduates, 42% of first-time freshmen, and traditionally serve populations that would not have access to higher education except for the existence of community colleges (American Association of Community Colleges 2014).

This paper seeks to answer several questions. Firstly, what factors influence student choice for higher education? Secondly, how have changes in public funding for higher education impacted student financial burdens for those attending public two-year colleges? Lastly, how have changes in public funding for higher education in other countries impacted accessibility to higher education in those countries?

CHAPTER II – LITERATURE REVIEW

Based on the research questions, the literature review will be segregated into the following parts to summarize the existing literature for each area: history of higher education and the community college; two-year institutions in other countries; choice of community college among higher education students; public support of two-year institutions; and public support of two-year institutions in other countries.

A History of Higher Education and the Community College

Prior to the mid-1800s in the United States, higher education focused on professional training for law, medicine, and the clergy. The expansion of the United States to the west created opportunities for the growth of the nation. The government, through various programs, sought to settle the country and promote development through the building of roads and railways. As part of the plan to insure the success of settlement, Justin Morrill of Vermont proposed to Congress the idea of the establishment of colleges focused on economics which were identified as agriculture and mechanic arts. He argued that agricultural products were the largest and most prosperous sector of the United States economy and the nation as a whole would benefit from investment in this industry through training and technology. The Morrill Act of 1862 distributed federal land to states for the establishment of land-grant colleges for the purpose of training in agriculture and associated technology. The rationale for the investment in land-grant colleges regarded this type of higher education as a public good and also established a precedent for public funding of higher education (Key 1996).

It was not until the early 20th century that the United States began to establish two-year institutions of higher learning as a way for students to take lower-division

university courses yet unable to leave home to attend a university. California passed a law in 1907 that allowed for local school boards to offer lower division courses. In 1910, the city of Fresno used this law to establish a junior college citing the need for "there was no institution of higher education within nearly two hundred miles of the city" (Cohen, Brawer and Kisker 2014, 20). The rural nature of much of the United States during the early 20th century facilitated establishment of local or "community" colleges as a way to solve the geographic issue of access for those wishing to pursue higher education within the United States (Cohen, Brawer, and Kisker 2014; Kane and Rouse 1999). Junior colleges, as they were initially referred to, were established across the country, primarily to facilitate higher education with lower-division courses taught for the purpose of transfer to a university.

Another important event in the history of higher education in the United States was the passage of the Servicemen's Readjustment Act in 1944, better known as the G.I. Bill (Thelin 2004). This legislation offered tuition assistance as an entitlement to veterans and was portable, meaning the tuition entitlement followed the student to whichever institution they chose. The legislation was important because it looked at increasing access to higher education, if only for a segment of society.

The same decade of the 1940s would see two additional arguments involving higher education that would engage society and shape policy in years to come. In 1945, Vannevar Bush wrote *Science: The Endless Frontier* wherein he made the case for federal funding for large-scale science research by universities. The second publication, *The Truman Report*, had a more immediate impact on community colleges as it charged

the nation with expanding access to higher education as it recognized the racial, religious, and financial barriers that many Americans had to higher education.

With the release of *The Truman Report* in 1947 (The President's Commission on Higher Education), President Truman sought to increase the human capital resources of the nation. The numbers of those undereducated in 1947 were considerable with "…two-thirds of the 18- and 19-year-old youths were not in school" (The President's Commission on Higher Education 1947, 27). The President's Commission further reported that national spending on "colleges and universities was less than one-half of 1 percent of the gross national product" (1947, 27).

The President's Commission went on to charge that "one of the gravest charges to which American society is subject is that of failing to provide a reasonable equality of educational opportunity for its youth. For the great majority of our boys and girls, the kind and amount of education depends, not on their own abilities, but on the family or community into which they happened to be born or, worse still, on the color of their skin or the religion of their parents" (1947, 27). This statement outlined the necessity to create institutions that offered access to those for whom higher education would otherwise not be available.

The President's Commission outlined the barriers to higher education very simply as family and community, race, and religion and more generally defined in modern terms as socioeconomic barriers. However, the President's Commission's argument in favor of accessibility to higher education went beyond social responsibility. Their argument made tapping the leadership potential of highly talented yet undereducated and undertrained citizens was an issue of national defense. They estimated that approximately "49 percent

of our population has the mental ability to complete 14 years of schooling with a curriculum of general and vocational studies that should lead either to gainful employment or further study at a more advanced level" (The President's Commission on Higher Education 1947, 41). Though the arguments in Bush's *Endless Frontier* and the *Truman Report* differ on the way in which public funds should be invested in higher education, both publications together shaped the debate for increased public funding of higher education.

While the development and missions of these community colleges across the United States are not identical to one another, the literature is well established that community college should be tied to the needs of the community (Cohen, Brawer and Kisker 2014). The President's Commission articulated a similar directive stating:

> whatever form the community college takes, its purpose is educational service to the entire community, and this purpose requires of it a variety of functions and programs. It will provide college education for the youth of the community certainly, so as to remove geographic and economic barriers to educational opportunity and discover and develop individual talents at low cost and easy access. But in addition, the community college will serve as an active center of adult education. (1947, 67-68).

Many have expanded their missions to include career-technical education, workforce training, developmental education, continuing education, and community service (Cohen, Brawer and Kisker 2014, Kane and Rouse 1999).

It should be noted that the keeping costs low was part of the implied mission directive by the President's Commission and seen as a necessity to promoting access to those economically disadvantaged. According to the American Association of Community Colleges, there are 1,132 two-year institutions in the United States. Of this

1,132 institutions, 986 are classified as public, 115 are classified as independent (private), and 31 are tribal (American Association of Community Colleges 2014).

Community colleges as they are known in the United States have similar counterparts in other countries, but the mission is not always the same. As previously discussed, community colleges in the United States were designed to offer a local option for lower-division university courses to give the local populations an opportunity to receive a higher education. The addition of technical and workforce training came along much later in the development of community colleges in the United States.

Two-Year Institutions in Other Countries

The international equivalents of American community colleges are known by a variety of names including "community colleges, technical colleges, technical universities, polytechnics, further education (FE) institutions, technical and further education (TAFE) institutions, institutes of technology, colleges of technology and junior colleges" (Elsner, Boggs and Irwin 2008, ix). In addition to the variation of names, the missions, funding, and governance vary as well. However, Elsner, Boggs, and Irwin (2008, ix) identify several commonalities that they believe defines this sector of higher education to include open access, student success, and community and workforce development. Of these commalities, the open access nature, focus on student success, and the responsivess to the local community and local industry have been been the driving force for the expansion of community colleges in the United States. In this way, the development of community colleges as an instrument fueling economic development and prosperity seems to be common as seventy-six of the world's 196 countries have

some form of two-year post-secondary higher education institution (Latiner Raby and Valeau 2009).

Community colleges, as they exist in the United States and also Canada, are best described as comprehensive institutions. These institutions of higher learning offer lower-division courses designed for university transfer, technical skills education, workforce training, and remedial education. And due to a well-developed system of accrediting bodies, students can transfer between institutions with relative ease and in most cases their credits transfer with them (Cohen, Brawer and Kisker 2014).

However, the institutions in other countries that stand in the gap between compulsory education and universities do not offer the same comprehensive range of offerings. In fact, many of these institutions offer no university transfer courses and focus solely on vocational training.

Like counterpart institutions in the United States, other countries have turned to technology as a way to break down distance and other barriers to higher education, many with the hope that distance education would be a cost-effective alternative to brick and mortar institutions (Kaye and Rumble 1996). In Europe, distance education is referred to as open learning and it developed similarly to distance education in the United States with a first evolution being correspondence education and as technology improved further evolving into a distance education system as known in the early part of the 21st century. The use of the term "open" or "open university" refers only to the delivery method and perhaps course materials as it pertains to overcoming geographic access issues, but does not necessarily apply to admissions, student tuition and fees, etc.

Choice of Community College Among Higher Education Students

There exists a substantial body of literature that identifies factors influencing student selection of community college education among higher education institutions. Kane and Rouse (1999) identify several factors that impact student choice of community colleges. The first factor influencing choice of community college is cost of attendance. In 1999, the average cost of community college tuition across the United States was approximately half the cost of a typical university tuition. Kane and Rouse further recognize location of community colleges within many cities and towns, community college students are able to live at home while attending which allows them to work while a student. The geographic location of the community college allows students to attend without the need to relocate reducing the overall cost of attendance. Lower tuition and location have traditionally been key determinants to choice of community colleges among higher education options (Rouse 1994).

Kane and Rouse also cite flexible scheduling options for students as another factor effecting student choice of community colleges. Community colleges offer courses meeting at a broad variety of times and locations to meet the needs of their student populations to include day, evening, weekend classes meeting on campus, at work sites, and online. The flexibility of scheduling options is a key factor to access for the 84% of community college students who work and the 50% of community college students who work full-time while attending classes (Kane and Rouse 1999).

Other factors cited by Kane and Rouse reflect the nature of the student or their goals for attending a community college. The authors discuss the overall greater availability of remedial coursework at community colleges compared to four-year

institutions that often limit the remedial course offerings or deny admission to students whose basic skills are not at a certain level. Community colleges often serve populations who lack basic skills to be successful in gateway courses at the freshman level.

Further, Kane and Rouse discuss the vocational degrees offered by community college. For the purpose of their review, these are described as terminal degrees offered by community colleges which are not designed to transfer to a four-year institution. These degrees are designed to prepare graduates for the workforce immediately upon graduation rather than to transfer to university.

Rouse (1994) examines factors that prompted students choose two-year community colleges over four-year colleges, which she termed diversion, and the extent to which two-year community colleges provided a higher education option for students who would otherwise not attend college, which she termed democratization. For her study, she examined the National Longitudinal Survey, Youth Cohort (NLSY), the High School and Beyond (HSB) survey, and the October educational supplement of the Current Population Survey (CPS) to investigate these questions such as who attends, economic motives for attending two-year colleges, and the effects of tuition and geography on the decision to attend two-year or four-year college.

Rouse found "at all levels of tuition, increases in two-year tuition primarily discourage students from attending college altogether" (1994, 60). She estimates that a $100 increase in both two-year and four-year tuition decreases the likelihood of enrollment by 1.3. Rouse also asserts that community college students are more sensitive to increases in tuition. Her analysis indicates that an "8 percent increase in two-year college tuition will decrease the probability of college enrollment by 0.7, with the

probability of enrolling in a two-year school decreasing 0.9 and the likelihood of attending four-year college increase 0.2 (1994, 74).

While Rouse found that other factors were predictors of two-year college choice, such as likelihood the two-year college student is first-generation in college, the parent of the student was less likely to have attended a four-year college, and the community college student was more likely to have a lower levels of measured ability than a four-year college student, the two-year college offered these students access to higher education they might not otherwise have. Furthermore, Rouse determined these students are also more sensitive to increases in tuition and might not otherwise attend college if the cost of attending a two-year college becomes unmanageable.

Barreno and Traut (2012) surveyed student choice of community colleges in 2008. In a survey of community college students, they examine a number of factors that influenced student choice of a community college across gender, race and ethnicity, age group, full-time or part-time status, and academic goal. In aggregate and then disaggregated across various groupings, the top reason students select a particular community college is transferability of courses. As discussed in the previous section, the initial purpose for the creation of community colleges was to offer these lower-division academic courses which are designed to transfer to a four-year institution. Therefore, Barreno and Traut's finding of transferability of courses as the number one reason for selection of a particular community college is consistent with other studies and confirms the mission of the community college.

The next two most frequently selected reasons for attending a particular community college were availability of academic programs and campus location. Among

the respondents to their survey, Barreno and Traut (2012) determine an equal number of respondents selected these two factors at the same frequency. While availability of academic programs reinforces the university transfer mission of community colleges, campus location confirms another aspect of the community college mission. As a response to making higher education more accessible, geographic location was determined early on as an issue and many communities responded by starting colleges in their communities.

The fourth most frequently cited reason for attending a community college is cost (Barreno and Traut 2012). This finding is consistent with other studies citing low-cost of attendance as a choice of community college over other higher education options (Kane and Rouse 1999; Rouse 1994).

The next most frequently cited factors are available educational facilities and technology and advice from family, friends, and high school staff as fifth and sixth respectively (Barreno and Traut 2012). The seventh most frequently cited factor among respondents to the survey is financial aid, however, it ranked below 50% in frequency of responses.

Public Support of Two Year Institutions

In the early years of public junior or community colleges, the majority of institutional budgets came from local governments. As reported in Cohen, Brawer, and Kisker (2014), as early as 1918, two-year institutions received on average 94% of their revenue from local funds and only 6% from tuition and fees. By 1942, local funds had decreased to 57% of institutional budgets, tuition and fees had increased to 11%, and state funding was appropriated at 28% and federal funding at 2%, with the remaining 2%

from other sources. By 2010, the mix of funds had shifted so that on average tuition and fees now account for 16% of institutional budgets, local funds are at 18%, federal funds are 23%, state funds are 30%, private gifts are 1%, sales and services are 4%, and other income is 8% (Cohen, Brawer and Kisker 2014, 153). Contrasted with the most current figures for 2012 as published by the American Association of Community Colleges and reported by the National Center for Education Statistics tuition and fees are 29.5%, state funds are 28.1%, federal funds are 16.1%, local funds are 17.3%, and other funds are 9%. These are nationwide averages and do not adequately portray the differences in funding allocated by individual state systems. Katsinas and Tollefson (2008) describe the disparity with a comparison of New Mexico's support of their community colleges at less than 7% of their operational budgets with Pennsylvania's support at 46%.

While these averages vary among states, they do illustrate the changes over time to the nature of funding for two-year institutions. As state appropriations for community colleges have decreased, tuition and fees have increased to make up for the decrease in state support (Tollefson 2009). It is therefore useful to discuss tuition and fees from the student perspective and not simply from an institutional perspective as part of the discussion of operating budgets of community colleges.

The President's Commission discussed the flexibility of increasing student fees as a means of increasing revenue to higher education institutions. It noted that at the time (1947) there had been an increasing trend toward dependence on student fees in public institutions. The President's Commission noted this "should be a matter of serious concern in a democracy devoted to the principle of equality of educational opportunity" (1947, 33). If community colleges are to be about access to higher education for the

economically disadvantaged, then keeping tuition and fees to a manageable level for students is important.

Sullivan (2010a) examines tuition changes over time in current dollars, percentage of family income, various grant amounts, and student debt. Using data gathered from the National Center for Education Statistics, a division of the United States Department of Education, he compared tuition and fees per year at in-state rates for public two-year institutions from 1980/1981 with the same figures from 2007/2008. Sullivan also uses current dollars rather than adjusting for inflation as "citizens in communities experience and remember cost changes related to community colleges" (Sullivan 2010a, 649). Sullivan reported the following changes as shown in Table 1 below.

Table 1

Changes in Public Two Year Education Costs and Assistance

Changes in Public Two-Year Education Costs and Assistance

Metric	1980/81	2007/08	% change
Average Tuition and Fees	$391	$2,063	427%
Average Federal Student Loan Award	$2,561	$4,399	71%
Federal Grants (Pell, SEOG, LEAP, etc.) (Total)	$16,996,000	$20,946,000	23%
Federal Loans (Perkins, Sub Stafford, Unsub Stafford, etc.)	$17,526,000	$66,815,000	281%

Source: Sullivan 2010a. All figures reported in current dollars.

Sullivan uses this data to illustrate the high-tuition high-aid model that many public higher education institutions have employed in response to decreases in state

funding. Sullivan argues that this high-tuition high-aid model has a negative impact on low-income families, who would have been more likely to choose a public community college. Data compiled by Sullivan illustrates the percentage of family income needed to pay tuition, room, and board at a public two-year college is shown in Table 2 below. Sullivan argues the high-tuition high-aid/debt model serves to restrict access to those with the least ability to pay and the most vulnerable to high debt.

Table 2

Percent of Family Income Needed for Public Two-Year College

Percent of Family Income Needed to Pay Tuition, Room, and Board at a Public Two-Year College

Family Income Range (in Quartiles)	**1992**	**2005**
Lowest 20%	50%	58%
Middle 20%	14%	17%
Highest 20%	6%	7%

Source: Sullivan 2010a.

Georgianna and Jones (2007, 18) discuss how decreases in public spending on higher education affects students' ability to pay and access to higher education, which they argue is a "specific reference to the perceived privatization of the benefits from higher education." They maintain that the decline in direct state appropriations is transmitted to declining access and choice of institution because institutions make up the shortfalls in appropriations through increases in tuition and fees. The declines in direct student aid to economically disadvantaged students inhibits their ability to pay tuition at the increased rates.

Georgianna and Jones (2007) discuss how both public and private universities changed their business model since 1993 and adopted a high-tuition high-aid model. The change was designed to make up decreases in state appropriations with higher tuition and seek students who had the ability to pay. These same institutions increased institutional aid to students, but Georgianna and Jones (2007) argue that there is evidence that during this same time that more institutional aid was merit based rather than need based. They argue the result of this practice has been to attract more middle-income students who can pay more and restrict access of the lower income students. These low-income students have less access to sufficient aid to attend a university with the high tuition high aid model and therefore turn to community colleges as a low-cost alternative to higher education.

Georgianna and Jones (2007, 20) assert this high-tuition high-aid model hurts lower-income students by restricting their access due to the shift in aid away from grants and toward loans which must be repaid. "While federal, state, and institutional grants have increased, they haven't increased enough to cover the increasing cost of college, which leaves the remainder to be paid from family savings and current income. Lower-income students, therefore, rely more heavily on government loans because neither they nor their parents can afford to pay tuition and other costs."

Most community colleges have access to some combination of three main funding sources: tuition and fees (which includes self-pay and/or student aid of any type), state funds, and local funds (Tollefson 2009). As discussed previously by Georgianna and Jones (2007), a common compensation for decreases in state and local funds is to increase tuition and fees. However, there are other ways in which community colleges

adjust to decreases in public funding, but like the high tuition high aid model, they threaten access to students they are meant to serve.

Hendrick, Hightower, and Gregory (2006) cite several policies that community colleges often employ as offsets to shrinking budgets such as limiting program admission or competitive admissions (2006). The idea of capping enrollment at community colleges established to offer access to higher education seems counterproductive to the mission, but it has been reported by some institutions as a cost saving measure. Other instances where admissions are competitive, such as many of the allied health programs, are common due to the high cost nature of the programs.

Some institutions, such as community colleges in the Virginia system, have begun shifting toward an emphasis on noncredit workforce training rather than credit courses. The shift allows for a different funding stream and is not as costly as the credit programs due to accreditation and funding formula restrictions. However this noncredit training does not offer a straightforward path to a university and seems also counterproductive to the original community college mission of offering lower division academic courses designed for university transfer (Hendrick, Hightower and Gregory 2006).

Hendrick, Hightower, and Gregory (2006) call attention to the trend among states toward performance based funding of education, and the effects it could have on higher education in particular. Under performance based funding mechanisms, the formulas are skewed toward outputs rather than inputs. This means that instead of looking enrollment or full-time equivalent served, system inputs for a traditional funding mechanism, performance based funding models look at outcome metrics such as percentages of

students progressing through a series of developmental courses to be college ready, time to degree, and graduation rates which favor full-time students over part-time students.

Developmental education and service to part time students who progress more slowly through an educational program drive costs up or do little to improve outcomes could receive decreased institutional support as state funding is shifted from an enrollment model to a performance based model. Students in developmental courses need remediation very often because they are seeking retraining for a new career, but are nonetheless underprepared for college-level work. Part-time students often don't qualify for traditional student aid packages which require full-time status making them ineligible for aid. The current model of high tuition high aid forces them to be part-time and lengthens their time to degree and leaves them out of completion metrics which work off of a first-time full-time cohort. Tuition models which favor full-time over part-time decreases access for these students. And institutional support models which don't attend to underprepared students also decrease access.

Waiting lists are another practice that inhibits access to higher education. Hendrick, Hightower, and Gregory (2006) discuss the waiting list mechanism practiced in 2000 by Oregon community colleges whereby thousands of students were placed on hold while institutions waited for the state legislature to release state funds allowing them to hire additional faculty when enrollment growth outpaced state funding. Part-time students and workforce training needs were affected in the short term, however keeping a practice like waiting lists in place threaten access in the long term as well.

Some states have considered proposals to prioritize student enrollments and reduce state funding for students who already possess a degree to try to expand

opportunities for first-time college students (Hendrick, Hightower and Gregory 2006). Similar proposals have been defeated in the past in various states, but proposals similar to this are discussed from time to time as state budgets shrink

Hendrick, Hightower, and Gregory (2006) also point to the broad mission of the community colleges as an area for revision. They suggest that some community colleges may need to narrow their mission, focus on areas they can perform well in, abandon areas they cannot sustain, and possible even develop areas of specialization. Hendrick, Hightower, and Gregory (2006) discuss plans that were discussed in California and New York in the 1990s to remove remedial education from senior level institutions as well as from community colleges in an effort to narrow the financial burden of remedial created by the open access system.

Another possibility discussed by Hendrick, Hightower, and Gregory (2006) was to toughen academic standards requiring students to maintain a higher grade point average in core courses to receive a degree. The practice, they argue, restricts access indirectly and cited "Miami Dade Community College's educational reforms of the early 1980's suspended or dismissed over 8,000 students not performing to required expectation levels (Nigliazzio 1986). While measures like this do increase the overall level of student performance, they also scare off a large group of students with varying educational, social, and economic needs" (Hendrick, Hightower and Gregory 2006, 634-635).

While there is no specific language in the United States constitution outlining a role for the federal government in providing access to public higher education, several key pieces of legislation which include the Morrill Act, Servicemen's Readjustment Act,

Higher Education Opportunity Act and its subsequent reauthorizations have made the federal government a facilitator of access to higher education, both public and private. These pieces of legislation which have received widespread public support have reflect the nation's commitment to access to higher education and public higher education in particular. President Barack Obama has made educational attainment a national priority, reinforcing the federal role in maintaining human capital for the security of the United States (Alexander, et al. 2010).

While there is no specific language in the United States constitution outlining a role for the federal government in providing access to public higher education, several key pieces of legislation which include the Morrill Act, Servicemen's Readjustment Act, Higher Education Opportunity Act and its subsequent reauthorizations have made the federal government a facilitator of access to higher education, both public and private. These pieces of legislation which have received widespread public support have reflect the nation's commitment to access to higher education and public higher education in particular. President Barack Obama has made educational attainment a national priority, reinforcing the federal role in maintaining human capital for the security of the United States (Alexander, et al. 2010).

Alexander outlined Congressional scrutiny of:

> the complex relationship between federal student aid, states' funding appropriations for higher education, and institutional tuition and fee levels. Fueling this focus is the ongoing cost shift in public higher education, from states to students and families, as well as to the federal government via student aid programs. This shift in who pays for education is primarily a consequence of gradual state disinvestment in public higher education….. The shift in higher education funding, from states to students--- driven by insufficient, and in many cases, sharply reduced state appropriations for higher education--- has placed

> more pressure on federal lawmakers to expand existing student aid program (2010, 76).

They go on to describe recent federal legislation that established financial incentives for state lawmakers to maintain minimum state appropriation levels called "Maintenance of Effort" (MOE) provisions. Alexander et al explain that these minimum state funding levels are necessary as "Congress intended for these federal monies to supplement state resources aimed at supporting institutions and students, not supplant states' fiscal commitments to higher education" (2010, 76).

Also driving the Congressional scrutiny of federal funds spent on higher education is the for-profit sector. The federal government through the United States Department of Education, Congress, and the Governmental Accounting Office have all investigated the for-profit sector and reported findings at various points since the 1980s. The reports describe the sector as charging excessive and exorbitant tuition rates, participate in aggressive recruiting practices, and have poor student outcomes. Of particular interest has been the new Post 9/11 G.I. Bill which offered expanded education opportunities for veterans, and opportunities for the for-profit institutions as well. In 2010, "the top twenty for-profit education companies received $521 million in veterans' education funds" (Cohen, Brawer and Kisker 2014, 482).

Public Support of Higher Education in Other Countries

Other countries have similar issues with public funding of higher education. DoCampo (2007) examined funding of higher education at the international level. Using indicators selected from the OECD, DoCampo examines research and development expenditures, tax levels, and the entry rate into higher education in a variety of countries

to determine the effects of education funding policies on higher education enrollment. He identifies two distinct models for the funding of higher education: the Scandinavian model and the Anglo-American model. He notes that while there is consensus among developed countries with regard to primary and secondary education as a public good, just as in the United States, there is a debate at the tertiary level. At best, tertiary education is regarded as a mixed good because it simultaneously provides positive externalities to society at large (i.e. better goods, better services, more taxes received on higher incomes, etc.) and private benefits to students (i.e. greater income potential, better access to goods and services, career growth, etc.).

It is this debate that seems to drive public support for funding of higher education in developed countries. Docampo (2007) finds that public spending across the OECD countries ranges between 0.8 percent of GDP on the low end and 1.5 percent of GDP on the high end with the OECD average public spending on tertiary education at 1.3 percent of GDP. Excluded from this calculation are the Scandinavian countries because they are few in number and their overall spending far outpaces the rest of the OECD.

Docampo (2007) describes the Scandinavian model as placing a high social value on education in general and higher education in particular and public spending at rates far above the OECD average. The Scandinavian model is also characterized by "very high taxes, a strong R & D commitment, substantial public spending in higher education and large enrollment figures" (Docampo 2007, 372).

In contrast, Docampo (2007, 370) describes the Anglo-American model as assigning a lower social value to higher education as evidenced by under-funding the sector while discussing higher education as a universal right. Other characteristics of the

Anglo-American model include lower taxes and substantial private spending in higher education in spite of strong R & D commitments and large enrollment figures (Docampo 2007, 372).

Docampo analyzed seven indicators in his study of international comparisons: 1) public expenditure on education as a percentage of GDP; 2) public expenditure on higher education as a percentage of GDP; 3) private expenditure on higher education as a percentage of GDP; 4) total spending on higher education as a percentage of GDP; 5) taxes on the average worker; 6) gross enrollment ratio; and 7) expenditures on R & D as a percentage of GDP (2007, 372). He examined the following fifteen developed countries for each of these indicators: Australia, Canada, Denmark, Finland, France, Germany, Italy, Japan, Korea, the Netherlands, Norway, Spain, Sweden, the United Kingdom, and the United States of America.

Docampo (2007) finds that countries following the Scandinavian model have greater overall success in guaranteeing large enrollment figures, the standard measure of accessibility. He also determines the United States of America and Korea were the only two developed countries following the Anglo-American model which exhibit large enrollments. It should be noted that while Docampo makes reference to the nature of the private expenditures on higher education, he did not break down the nature of the private expenditures for the purpose of this study into loan debt incurred by students as a part of this indicator. The fact that the United States ranked number two in Docampo's analysis for countries with policies leading to high enrollment in higher education, there is some question as to whether this model is sustainable in the United States of America due to concerns of over large amounts of student loan debt.

Tilak (1996) was one such researcher to discuss the pros and cons of privatization in 1991 when writing for the UNESCO International Review of Education. He framed his argument in economic terms, citing growth in private higher education throughout the world as stemming from excess demand that was not being met due to limitations of public higher education in countries throughout the world and also a desire for differentiated demand which could have been in part because of a desire for better quality or simply better marketing on the part of the private institutions (Tilak 1996). Tilak (1996) also addressed the supply side of education economics in that private entrepreneurs stepped in to fill higher education gaps in various countries sometimes out of philanthropic or altruistic motives which he described as institutions with religious affiliations and also for profit which is more often the case.

Tilak (1996) discusses the challenges of defining the nature of public vs. private higher education institutions in that the common definitions were focused on either funding streams or management and governance. Tilak describes challenges to clearly defining institutions as either public or private. Revenue sources and governance are two examples where the challenge of defining an institution as either public or private becomes difficult. For instance, some private institutions receive substantial funding from governments in the form of research grants or aid paid on behalf of students and some public institutions generate large sums of revenue from private sources like donations, endowments, and private venture. Strictly defining an institution in terms of revenue sources is difficult when the revenue comes from multiple entities. Also, governance presents a similar dilemma in that private institutions are regulated by the same laws as public institutions and both public and private institutions may have appointed boards of

directors or trustees. Tilak (1996) asserts the best method for labeling institutions as public or private rested in the character or motive of the institution with public institutions being "not for profit" and private institutions being "for profit." However, even Tilak (1996) noted this simplistic distinction had its limitations as well.

While Tilak (1996) verbalized many of the arguments for and against privatization, he also sought to address these same arguments with research. The strongest argument privatization noted was that private institutions assist governments in addressing the desires of the citizens for higher education as public budgets are in decline and public institutions are strained to capacity. While there is demand for higher education beyond the capacity of public institutions in both developed and developing countries, the way in which the private institutions meet this demand with higher cost to students, no increased access to poor students, low-capital intensive disciplines of study, and no actual evidence of higher quality would make private higher education a poor alternative to well-supported public higher education.

Tilak (1996) also cited another popular argument for privatization that competition between public and private sectors of higher education typically has the same effect as it would in any other market of improving quality and efficiency. He notes that the higher education sector, when treated as a true market sector in economic terms, does not perform as one would expect based on evidence of competition response from other markets. He cites the positive externalities of higher education that make it atypical for market discussion in pure economic terms because higher education is a quasi-public good. Also, private higher education institutions are insensitive to distributional considerations and because of their higher cost often contribute to further socio-economic

inequalities. And finally, Tilak (1996, 62) argues that the market system fails to keep "consumers" or in this case the students well-informed of the costs and benefits of higher education (Tilak 1996, 62).

While Tilak (1996) did not conclude that higher education should be funded in total by governments, he discussed several mixed systems that combined public funding with private or student responsibility for costs. As of the publication of his article in 1996, Tilak noted that countries around the world were trying various funding strategies that ranged from increasing student fees, graduate tax, student loans, he also noted that there were strengths and weaknesses with the implementation of these strategies. Tilak (1996) went on to recommend a selective pricing scheme that would allow students to pay at different rates based on their socio-economic status. He asserted that "privatization of this type would be more efficient, generating additional private resources for higher education, and also more equitable, as it would not create dual structures of higher education, as do the other forms described [above] – one for the elite and another for the masses" (Tilak 1996, 69).

This strategy has been implemented at many higher education institutions in the United States, however the selective pricing is not based so much on socio-economic status as a variety of factors. The variety of factors include merit scholarships, performance scholarships, and various other types of financial aid that are need-based and non-need based. The argument against this method of net pricing is unequal treatment of students in that often those with the least personal and familial advantages often pay more than counterparts who have had better advantages from the beginning of their education (Sullivan 2010a; Sullivan 2010b; Oreopoulos and Petronijevic 2013).

If public funding of higher education is a challenge in industrialized countries, it is an even greater challenge for developing countries. Higher education, sometimes referred to as post-compulsory education, is now regarded as a necessity for industrialization and economic development. "Properly trained engineers, managers, professionals, and high level technical and administrative support personnel are crucial to the establishment of efficient industries and government services, and thereby to the generation of employment for those with only compulsory schooling" (Eicher and Chevaillier 1996, 90). Demand for higher education has grown at exponential rates since the 1950s due in part to demographics and rising expectations. This demand drove enrollments upward and in turn public expenditures on higher education increased as well. However, Eicher and Chevaillier (1996) observed that the economic challenges faced by market economies after the first oil crisis of 1973 caused a reversal of this upward trend toward and by the late 1970s the defunding was becoming more noticeable.

One of the questions posed by Eicher and Chevaillier (1996, 93) was "Who should pay for education?" They argue that a mixed system is optimum financing solution, and superior to both a purely private financing or purely public financing. As far as the type of institutions, they maintain that the mixed financing solution be available for both public and private institutions. However, they go on to discuss the further decisions that should be made regarding this mix of financing or more specifically, should the money be given directly to the institutions or should the money follow the student based on their choice of institution, and additionally, what is the most efficient way of reducing unit cost through this mix of financing.

Eicher and Chevaillier (1996) make a strong case for public funding of education, offering several arguments the strongest of which involve the positive externalities provided by higher education and that of government as an entity seeking to maximize its revenue. Higher education's public externalities are widely accepted as a component of economic development, flexibility of the labor market, as well as the transmission of literacy and aesthetic and cultural values that make for more efficient political participation.

They also argue that governments should see public financing of higher education as an investment in the livelihood of taxpayers, meaning that enabling a taxpayer to increase their personal earning power. The more income a taxpayer earns because of the opportunities afforded due to educational attainment, in turn enables a taxpayer to pay more taxes because of the higher income and maximizes tax revenues collected by the government offering the government a return on its investment in higher education.

Eicher and Chevaillier (1996) also discuss several widely accepted arguments for private financing of higher education. One of the strongest arguments they discuss is the 'token user charge' meaning that people are more inclined to appreciate that for which a fee is charged than is available freely. There is also a resulting consideration for institutions through the charging of fees directly to students. Institutions find it necessary to maintain a level of quality because students are able to be selective about where they choose to earn a higher education credential and higher education institutions must appreciate that they have competition for the needs and desires of students and organize their offerings to maximize their attractiveness as a solution to students' wants and desires.

Eicher and Chevaillier (1996) outline their notion of the optimal financial setting for higher education as a mixed model of public and private financing, with the predominant source of financing being from the public sector. They assert that public financing should consist of unrestricted block grant to institutions ensuring a minimum of security and continuity, specific grants negotiated between each institution and one or more public bodies, income-related grants to students covering tuition and maintenance, and guaranteed student loans (Eicher and Chevaillier 1996, 107). Their recommendation for private financing of higher education should consist of fees in the form of tuition and special fees that can be set freely by institutions within limits, business contributions (which they argue should be limited) aimed at training of workers or research grants, and gifts and endowments.

In 2011, Dodds discusses the future of the unrestricted block grants in the United Kingdom. She mentions specifically, the Browne Review, a report commissioned by the government to address public funding of higher education and student finance. The report proposes changes to the existing system or mix of support for higher education institutions (HEIs), including the abolition of unrestricted block grants from the British government for teaching non-STEM subjects and replacing it with a system whereby student fees are charged at levels varying between HEIs. The foundational idea for this change would be to place choice in the hands of the student, rather than in the hands of the institution. The Browne Review sees the lack of competition among HEIs as an inefficiency of the education sector with regard to public financing. The Browne Review recommends using student choice through payment of fees to HEIs as a way to encourage efficiency. The current system of student block grants is seen as inefficient and the report

seeks a solution that ensures public funding for higher education is "well-spent" (Dodds 2011).

It should also be noted that while the Brown Review acknowledges the public benefits of higher education for individuals such as economic growth and improved health of the society, it maintains that the private benefits of higher education to individuals outweighs the public benefits to society at large (Dodds 2011). This argument for greater private benefits belies a shift in perception of higher education as a private good rather than a public good.

CHAPTER III - METHODOLOGY

Introduction

Since their inception in California in early 1900s, community colleges have been about facilitating access to higher education. The purpose of the earliest community colleges was to eliminate geographic barriers to higher education. However, the release of the Truman Commission Report in 1947 broadened the purpose of the nation to eliminate socioeconomic barriers to higher education as well. Landmark legislation such as the Servicemen's Readjustment Act (G.I. Bill) in 1944 and the Basic Educational Opportunity Grant (Pell Grant) in 1972 was passed to create opportunities for higher education for those who would not otherwise be able to afford it.

With a national focus on accessibility to higher education, "community colleges have traditionally strived for equality of opportunity through low, or no, tuition. Faced with skyrocketing costs of higher education, many states have had to abandon this ideal" (Rouse 1994, 59). The rising cost of tuition has caused some students and their families to choose not just between attending community college and attending a university, but also between substantial student loan debt and not pursuing higher education all together.

Model

This paper seeks to utilize a model from an earlier study completed in 1994. The 1994 study used the National Longitudinal Survey of Youth to examine who attends community college, the reasons for selecting community college, and the influence of college tuition and distance on the decision to attend a community college or four-year university. In this 1994 study, Rouse used a multinomial logic (MNL) model representing three choices: starting in two-year college, starting in four-year college, or

not attending college. Rouse used a basic random utility framework for modeling college choice behavior.

Rouse's original 1994 study used the model outlined previously with data on 18-year olds between 1979 and 1983 to examine student choice of higher education against relative tuition and geographic proximity to a two-year institution. Her study makes assumptions that students make decisions based on their state of residence, tuition, and family income when they were eighteen years old. Rouse also considers only those participants who are considered college-ready, which she defines as those having completed at least twelve years of education as college drop-outs are not considered eligible for four-year institutions. She also looks only at the first school participants report attending, and does not look at completion versus stop-out, or subsequent schools attended.

Rouse's utility models for college choice decisions were styled as follows: If an individual chooses one of three alternatives—no college (NC), two-year or junior (community) college (JC), or four-year or senior college (SC), then the utilities can be represented as

$$U_{i,NC} = U_{i,NC} + \varepsilon_{i,NC}$$
$$U_{i,JC} = U_{i,JC} + \varepsilon_{i,JC}$$
$$U_{i,SC} = U_{i,SC} + \varepsilon_{i,SC}$$

Where $\varepsilon_{i,j}$ represents random error. An individual, I, receives utility from each alternative, j, such that

$$U_{ij} = \beta_{ij}X_i + \delta_j T_{ij} + \varepsilon_{i,j}$$

Where X represents a matrix of individual-specific characteristics, such as socioeconomic status and measured ability, and Tj represents alternative-specific characteristics, such as college tuition. An individual will choose an alternative if it maximizes her utility. That probability that she starts at junior college is thus:

$$Pr(U_{i,JC} > U_{i,SC}, U_{i,JC} > U_{i,NC}) = Pr(\varepsilon_{i,SC} - \varepsilon_{i,JC} < U_{iJC} - U_{iSC}$$

And $\varepsilon_{i,NC} - \varepsilon_{i,JC} < U_{iJC} - U_{iNC})$.

The MNL assumes that the error (ε's) are logistically distributed. Thus:

$$Pr(JC)_i = \frac{\exp(\beta_{JC}X_i + \delta_j T_{JC})}{\exp \sum_{j=1}^{3}(\beta_j X_i + \delta_j T_{ij})}$$

Data Sources

The data sources for this dissertation will be drawn from published, publicly-available sources to include National Center for Education Statistics Integrated Post-secondary Education Statistics (IPEDS), the United States Bureau of Labor Statistics National Longitudinal Survey Youth Cohort (NLSY) 1997 study, the Organisation for Economic Co-operation and Development (OECD), and the World Bank.

Research Questions

Research Question #1: What factors influence student choice for higher education?

To answer this question, the NLSY was initiated again in 1997 and asks essentially the same survey questions. This study will use the 1997 data and will use the same model as outlined previously while examining respondents who were between 17 and 20 years old in the year 2000 who had graduated high school. In keeping with

Rouse's 1994 study, this paper will utilize logistic regression with more recent data from the National Longitudinal Survey of Youth 1997.

$H_0$1: Household income has no effect on student choice of higher education.

H_a1: Household income has a positive effect on student choice of higher education.

$H_0$2: Household size has no effect on student choice of higher education.

H_a2: Household size has a positive effect on student choice of higher education.

$H_0$3: Father's level of education has no effect on student choice of higher education.

H_a3: Father's level of education has a positive effect on student choice of higher education.

$H_0$4: Mother's level of education has no effect on student choice of higher education.

H_a4: Mother's level of education has a positive effect on student choice of higher education.

$H_0$5: Gender has no effect on student choice of higher education.

H_a5: Gender has a positive effect on student choice of higher education.

$H_0$6: Cognitive ability has no effect on student choice of higher education.

H_a6: Cognitive ability has a positive effect on student choice of higher education.

$H_0$7: Cognitive ability has no effect on student choice of higher education.

H_a7: Cognitive ability has a positive effect on student choice of higher education.

$H_0$8: Race has no effect on student choice of higher education.

H_a8: Race has a positive effect on student choice of higher education.

$H_0$9: Geographic location has no effect on student choice of higher education.

H_a9: Geographic location has a positive effect on student choice of higher education.

Research Question #2: How have changes in public funding for higher education impacted student financial burdens?

To answer this research question, descriptive statistics will be used to examine changes in enrollment ratios, tuition and fees, state appropriations, and average student loan awarded for students enrolled in public community colleges. Data reported will be gathered at the institutional level for the public two-year sector from the National Center for Education Statistics Integrated Post-secondary Education Data System (IPEDS), and aggregated at the state and national level for comparison. Data for years 2000-2001 and 2013-2014 will be compared to differences.

$H_0$10: State appropriations for public two-year institutions have had no impact on enrollment at public higher education institutions.

H_a10: State appropriations for higher education have had a negative impact on enrollment at public higher education institutions.

Research Question #3: How have changes in public funding for higher education impacted accessibility in other countries?

$H_0$11: Public funding for higher education has no impact on enrollment in higher education institutions in other countries.

H_a11: Public funding for higher education has a positive impact on enrollment in higher education institutions in other countries.

To answer this research question, descriptive statistics and t-tests of public and private spending at all education levels and categorized into primary, secondary, and tertiary with data available through the Organisation for Economic Co-operation and Development (OECD) and the World Bank. The tertiary level includes higher education institutions for a country consisting of universities and community or technical colleges as may be applicable. While it is not possible to disaggregate the tertiary data between universities and community or technical colleges, a broad picture of potential differences in higher education spending in other countries will be possible.

CHAPTER IV – ANALYSIS

Student Choice of Higher Education

Using data from the National Longitudinal Survey of Youth (NLSY) 1997 cohort, a logistic regression was used to examine a dataset of responses to the survey gathered in 2000. In 2000, the respondents to the survey were between 17 and 20 years old and making decisions regarding choice of higher education.

The original dataset extracted from the NLSY97 contained 1,192 observations. All respondents included in the dataset possessed a high school diploma. GED recipients and non-high school graduates were not included as four-year institutions typically do not grant admission to an applicant without a high school diploma. Any observations that had no response for any of the variables selected were excluded from the dataset.

The dependent variable was choice for higher education with possible values of community college, four-year university, or no higher education at all. The independent variables examined included gender female, household income, household size, highest grade completed by father, highest grade completed by mother, ASVAB score as a measure of cognitive ability, geographic region variables for northeast, north central, and south, and race variables for African-American, Hispanic, and non-African American non-Hispanic.

The dataset was replicated so that the dependent variable, choice of higher education, could be recoded to test the dependent variable in a series of logistic regressions. The dependent variable responses were combined in 3 different ways for a series of 3 logistic regressions: four-year university or no higher education, community

college or no higher education, and four-year university or community college. Each of the logistic regressions are reported individually in the following sections.

Logistic Regression 1: Four-Year University or No Higher Education

In the first logistic regression, the two choices for higher education tested are four-year university or no higher education. All respondents choosing community college are excluded from the dataset. The results of the logistic regression are displayed in Table 3 below.

Table 3

Student Choice of Four-Year University or No Higher Education

Independent Variables	Odds Ratios	Coefficients	*P*
Gender	0.378	-0.973	0.000
		(0.220)	
Household Income	1.000	0.000	0.000
		(0.000)	
Household Size	0.850	-1.623	0.076
		(0.091)	
Father's Highest Grade Attained	1.198	0.180	0.000
		(0.045)	
Mother's Highest Grade Attained	1.021	0.021	0.370
		(0.24)	
ASVAB Score	1.000	0.000	0.000
		(0.000)	
Geographic Region Northeast	1.546	0.436	0.213
		(0.349)	
Geographic Region North Central	1.498	0.404	0.209
		(0.322)	
Geographic Region South	1.234	0.211	0.520
		(0.327)	
Race African American	2.988	1.092	0.002
		(0.348)	

Table 3 (continued)

Race Hispanic	2.293	0.829	0.019
		(0.353)	
Race Mixed	3.841	1.346	0.359
		(1.467)	
Constant	0.002	-6.106	0.000
		(0.860)	
Observations		726	
Pseudo R-squared		0.446	

Standard errors in parentheses. $p < 0.05$

In the first test of the dependent variable student choice for higher education where the selections were four-year university or no higher education, the independent variables gender female, household income, higher grade completed by father, ASVAB score, race African American, and race Hispanic are statistically significant.

Household income with a p-value of 0.000 is statistically significant. As an indicator of choice of higher education, household income has a positive effect on student selection of four-year university over no college education. When given a choice between a four-year university or no higher education, students from families with more financial means are more likely to choose higher education over no higher education. Likewise, students from families with less financial means must consider their ability to pay in the absence of any type of student aid and may often choose no higher education instead of attending a four-year university.

Highest grade completed by the father with a p-value of 0.000 is statistically significant. As an indicator of choice of higher education, higher grade completed by father had a positive effect on selection of four-year university over no higher education. Often, the more education the father has, the more earning potential and higher the

household income. Students from families where the father is highly educated tend to have more financial ability to choose higher education and likely more encouragement from the family to choose a four-year year university than their counterparts whose fathers are less education and have less earning potential.

The variable for the ASVAB score was used as a proxy for cognitive ability. As an independent variable in this logistic regression, ASVAB score had a p-value of 0.000 and is statistically significant and had a positive impact on student selection of four-year university over no higher education. This is to be expected as students with high cognitive ability tend to have successful high school performance and high standardized test scores allowing them to qualify for merit based scholarships in addition to any need-based scholarships. Students with high cognitive ability have greater options for choice of higher education.

Race is statistically significant for African-American students ($p = 0.002$) and Hispanic students ($p = 0.019$) and as indicators of choice of higher education, both of these independent variables had a positive effect on the choice of a four-year university over no higher education. When compared to non-black non-Hispanic students, African-American students were 2.98 times more likely to select four-year university over no higher education than their non-white counterparts. Hispanic students were 2.29 times more likely to select four-year university over no higher education than their non-black non-Hispanic counterparts. Students with African-American or Hispanic race/ethnicity are more likely to choose four-year university over no higher education as it is seen as a better way to provide for the future.

The most surprising outcome of the independent variables in this test comparing selection of four-year university over no higher education was gender female. While this variable was significant with a p-value of 0.000, its coefficient of -0.973 indicates females were less likely to attend four-year universities. In this test, females were 37% less likely to choose four-year university over no higher education and seems contrary to enrollment statistics that tend to show women enrolled in greater numbers than men (United States Department of Education n.d.).

Household size is not statistically significant with a p-value of 0.076. This could be in part because household size is not dependent upon household income. Income levels may have no bearing on size of the household giving it no value as a predictor of student choice of higher education. Another possible explanation is that larger households have larger income, ceteris paribus; and since income has already been included in the model the size fails to become statistically significant.

Highest grade completed by mother is not statistically significant with a p-value of 0.378. This could be in part because the earning power of women is typically lower than their male counterparts. Educational attainment of the mother may have some impact on selection, but not enough to be statistically significant. A more likely explanation is that people tend to marry someone with similar education levels. The presence of the father's highest grade completed as a variable in the model makes the mother's higher grade completed statistically insignificant as a variable.

Geographic region variables, which are northeast, north central, and southern, when compared with the western region are not statistically significant as reflected by the p-values of $p = 0.213$ for northeast, $p = 0.209$ for north central, and $p = 0.520$ for south,

respectively. Considering the abundance of public institutions across the country (734 public four-year universities), proximity to a four-year university is not an obstacle to overcome for students making the choice between four-year universities and no higher education.

The other race variable, race non-African American non-Hispanic, is not statistically significant with a p-value of $p = 0.359$. One reason could be that among the sample tested, less than 10 respondents self-identified as non-African American non-Hispanic. A larger number of non-African American non-Hispanic race respondents might have yielded more interesting results.

Logistic Regression 2: Community College or No Higher Education

In the second logistic regression, the two choices for higher education tested are community college or no higher education. All respondents choosing four-year university are excluded from the dataset. The results of the logistic regression are displayed in Table 4 below.

Table 4

Community College or No Higher Education

Independent Variables	Odds Ratios	Coefficients	*P*
Gender	0.589	-0.529	0.005
		(0.190)	
Household Income	1.000	0.000	0.002
		(0.000)	
Household Size	0.970	-0.029	0.675
		(0.071)	
Father's Highest Grade Attained	1.073	0.071	0.078
		(0.040)	
Mother's Highest Grade Attained	0.989	-0.011	0.666
		(0.025)	

Table 4 (continued)

ASVAB Score	1.000	0.000	0.000
		(0.000)	
Geographic Region Northeast	0.749	-0.288	0.380
		(0.328)	
Geographic Region North Central	0.865	-0.145	0.602
		(0.278)	
Geographic Region South	0.930	-0.072	0.783
		(0.261)	
Race African American	1.880	0.635	0.028
		(0.287)	
Race Hispanic	1.988	0.687	0.013
		(0.277)	
Race Mixed	4.290	1.456	0.223
		(1.195)	
Constant	0.078	-2.548	0.000
		(0.697)	
Observations		558	
Pseudo R-squared		0.107	

Standard errors in parentheses. $p < 0.05$

In the second test of the dependent variable student choice for higher education where the selections were community college or no higher education, the independent variables gender female, household income, ASVAB score, race African American, and race Hispanic are statistically significant.

Household income with a p-value of 0.002 is statistically significant. As an indicator of choice of higher education, household income has a positive effect on student selection of community college over no higher education. When given a choice between community college or no higher education, students from families with more financial means are more likely to choose higher education over no higher education. Likewise, students from families with less financial means must consider their ability to pay in the

absence of any type of student aid and may often choose no higher education instead of attending a community college.

The variable ASVAB score was used as a proxy for cognitive ability. As an independent variable in this logistic regression, ASVAB score had a p-value of 0.000 and is statistically significant and in this test had a positive effect on student selection of community college over no higher education. This is to be expected as students with high cognitive ability tend to have successful high school performance and high standardized test scores allowing them to qualify for merit based scholarships in addition to any need-based scholarships. Students with high cognitive ability have greater options for choice of higher education.

Race is statistically significant for African-American students ($p = 0.028$) and Hispanic students ($p = 0.013$) and as indicators of choice of higher education, both of these independent variables had a positive effect on the choice of a community college over no higher education. When compared to non-black non-Hispanic students, African-American students were 1.88 times more likely to select community college over no higher education than their non-black non-Hispanic counterparts. Hispanic students were 1.99 times more likely to select community college over no higher education than their non-black non-Hispanic counterparts. Students with African-American or Hispanic race/ethnicity are more likely to choose community college over no higher education as higher education is viewed as a better way to provide for the future.

The most surprising outcome of the independent variables in this test comparing selection of community college over no higher education was gender female. While this variable is significant with a p-value of 0.005, its coefficient of -0.528 indicates a

negative effect on females in selection of choice of higher education for this sample. In this test, females are 59% less likely to choose community college over no higher education and seems contrary to enrollment statistics that tend to show women enrolled in greater numbers than men. The American Association of Community Colleges using data gathered from the National Center for Education Statistics reports that 57% of community college attendees are women (American Association of Community Colleges 2016). However, it is useful to remember that students currently enrolled in any higher education institution have overcome their barriers to attendance and may not necessarily reflect the population overall.

Household size is not statistically significant with a p-value 0.675. This could be in part because household size is not dependent upon household income. Income levels may have no bearing on size of the household giving household size no value as a predictor of student choice of higher education.

The variables highest grade completed by father and highest grade completed by mother are not statistically significant with a p-value of $p = 0.078$ and $p = 0.666$ respectively. For students choosing between community college and no higher education, this is to be expected. Community colleges traditionally educate a larger portion of first-generation college students than universities. These students typically have parents that do not have a high level of education making it understandable that these variables would have little influence over choice of higher education in this test.

Geographic region variables, which are northeast, north central, and southern, when compared with the western region are not statistically significant as reflected by the p-values of $p = 0.380$ for northeast, $p = 0.602$ for north central, and $p = 0.783$ for south.

Considering the abundance of public institutions across the country (1,027 public community colleges), geography is not an obstacle to overcome for students making the choice between community college and no higher education.

The other race variable, race non-African American non-Hispanic, is not statistically significant with a p-value of p = 0.223. One reason could be that among the sample tested, only 3 respondents self-identified as non-African American non-Hispanic. A larger number of non-African American non-Hispanic race respondents might have yielded more useful results.

Logistic Regression 3: Community College or Four-Year University

In the second logistic regression, the two choices for higher education tested are community college or four-year University. All respondents choosing no higher education are excluded from the dataset. The results of the logistic regression are displayed in Table 5 below.

Table 5

Community College or Four-Year University

Independent Variables	Odds Ratios	Coefficients	*P*
Gender	1.533	0.428	0.038
		(0.206)	
Household Income	0.999	0.000	0.039
		(0.000)	
Household Size	1.066	0.064	0.447
		(0.085)	
Father's Highest Grade Attained	0.888	-0.119	0.009
		(0.045)	
Mother's Highest Grade Attained	0.945	-0.564	0.246
		(0.048)	

Table 5 (continued)

ASVAB Score	0.999	-0.00003	0.000
		(0.000)	
Geographic Region Northeast	0.372	-0.988	0.004
		(0.344)	
Geographic Region North Central	0.597	-0.516	0.079
		(0.294)	
Geographic Region South	0.897	-0.128	0.656
		(0.287)	
Race African American	0.414	-0.880	0.007
		(0.329)	
Race Hispanic	0.759	-0.276	0.393
		(0.323)	
Race Mixed	2.696	0.992	0.294
		(0.945)	
Constant	97.589	4.581	0.000
		(0.864)	
Observations		586	
Pseudo R-squared		0.209	

Standard errors in parentheses. $p < 0.05$

In the third test of the dependent variable student choice for higher education where the selections were community college or four-year university, the independent variables gender female, household income, highest grade completed by father, ASVAB score, geographic region northeast, and race African American are statistically significant.

Gender female with a p-value of 0.038 is statistically significant and its coefficient of 0.427 indicates a positive effect on females in selection of choice of higher education for this sample. In this test, females are 1.53 times more likely than males to choose community college over four-year university.

Household income with a p-value of 0.039 is statistically significant however its coefficient of -0.00005 indicates a negative effect on the choice of community college over four-year university. When given a choice between community college or four-year university, students from families with more financial means are more likely to choose four-year university. Likewise, students from families with less financial means must consider their ability to pay in the absence of any type of student aid and may often choose community college instead of attending a four-year university.

Highest grade completed by the father with a p-value of 0.009 is statistically significant however its coefficient of -0.118 indicates a negative effect on student choice of community college over four-year university. Often, the more education the father has, the more earning potential and higher the household income. Students from families where the father is highly educated tend to have more freedom to choose to attend a four-year university over community college.

The variable ASVAB score was used as a proxy for cognitive ability. As an independent variable in this logistic regression, ASVAB score had a p-value of 0.000 and is statistically significant. However, its coefficient of -0.00003 indicates a negative effect on student selection of community college over four-year university. This is to be expected as students with high cognitive ability tend to have successful high school performance and high standardized test scores allowing them to qualify for merit based scholarships in addition to need-based scholarships. Students with high cognitive ability have greater options for choice of higher education and will typically choose the four-year university over community college.

Geographic region northeast is a statistically significant variable in this test with a p-value of 0.004. However, its coefficient of -0.988 indicates a negative effect on student choice of community college over four-year university for students in the northeast region when compared with students in the western region. This could be explained in part to better acceptance of community colleges in the western region of the United States as compared to the northeast region of the United States.

Race is statistically significant for African-American students with a p-value of 0.004 however its coefficient of -0.880 indicates a negative effect on student choice of community college over four-year university. Students with African-American race/ethnicity are more likely to choose four-year university over no higher education as it is 41% more likely to choose a four-year university over community college than their non-black non-Hispanic counterparts.

Household size is not statistically significant with a p-value of 0.447. This could be in part because household size is not dependent upon household income. Income levels may have no bearing on size of the household giving it no value as a predictor of student choice of higher education.

Highest grade completed by mother is not statistically significant with a p-value of 0.246. This could be in part because the earning power of women is typically lower than their male counterparts. Educational attainment of the mother may have some impact on selection, but not enough to be statistically significant.

Geographic region variables, north central and southern, when compared with the western region are not statistically significant as reflected by the p-values $p = 0.079$ for north central, and $p = 0.656$ for south. Considering the abundance of public institutions

across the country (734 public four-year universities and 1,027 community colleges), geography is not a variable to overcome for students making the choice between community college and four-year university.

The other race variables, race Hispanic and race non-African American non-Hispanic, are not statistically significant with p-values of $p = 0.393$ and $p = 0.294$. One reason could be that among the sample tested, only 5 respondents self-identified as non-African American non-Hispanic. A larger number of non-African American non-Hispanic race respondents might have yielded more useful results. Hispanic respondents may not have a preference regarding choice of higher education and make their decision based on other criteria.

Effect of State Appropriations on Accessibility

In the early days of the American public community college, the funding was a combination of local and state level appropriations making tuition and fees paid by students and their families relatively small. However, over the last three decades states and the federal government have changed the way that public higher education is funded. The idea behind the shift in funding patterns is best described as "cost sharing" or a "high tuition, high aid" model as described by Patrick Sullivan (What Is Affordable Community College Tuition?: Part I 2010a, 645). He describes cost sharing as a model that "requires students and their families to shoulder a greater percentage of the burden" of the cost of their education. (What Is Affordable Community College Tuition?: Part I 2010a, 645) While this funding shift has been adopted by policy makers across the country for reasons both economic and political, Sullivan asserts that it places an unfair

burden on those at the lowest socioeconomic levels and in the most need of assistance, thus effecting accessibility to higher education.

In an effort to answer the questions related to accessibility from the institutional standpoint, data was obtained from the National Center for Education Statistics, which is a part of the United States Department of Education. Data was gathered at the institutional level and aggregated to the state and national level for enrollment, tuition and fees, state appropriations, and loans awarded. Enrollment ratios were calculated at the state and national level for public two-year institutions using total full-time and part-time enrollment at the state level as the numerator and census data for 15-24 year olds for the denominator. Data from the 2000-2001 academic year was compared to the 2013-2014 academic year in the Table 6 below.

Table 6

Enrollment Ratios by State for Public Two-Year Institutions

Enrollment Ratios - Public Two-Year Institutions- by State			
State	**2000_2001**	**2013_2014**	**% Change**
Alabama	0.1064	0.1237	16%
Alaska	0.2042	0.0101	-95%
Arizona	0.2379	0.2122	-11%
Arkansas	0.0848	0.1317	55%
California	0.2858	0.2635	-8%
Colorado	0.1191	0.1243	4%
Connecticut	0.1010	0.1114	10%
Delaware	0.1120	0.1124	0%
Florida	0.0313	0.0271	-14%
Georgia	0.0520	0.0871	68%
Hawaii	0.1283	0.1460	14%
Idaho	0.0493	0.1107	125%
Illinois	0.1976	0.1899	-4%
Indiana	0.0077	0.0969	1162%
Iowa	0.1574	0.2114	34%

Table 6 (continued)

Kansas	0.1736	0.1934	11%
Kentucky	0.0697	0.1441	107%
Louisiana	0.0481	0.1101	129%
Maine	0.0476	0.1131	138%
Maryland	0.1236	0.1690	37%
Massachusetts	0.0991	0.1078	9%
Michigan	0.1317	0.1423	8%
Minnesota	0.1448	0.1739	20%
Mississippi	0.1358	0.1683	24%
Missouri	0.0650	0.1206	86%
Montana	0.0408	0.0622	52%
Nebraska	0.1405	0.1503	7%
Nevada	0.0386	0.0295	-24%
New Hampshire	0.0674	0.0838	24%
New Jersey	0.1239	0.1414	14%
New Mexico	0.1908	0.2597	36%
New York	0.0813	0.1199	47%
North Carolina	0.1492	0.1702	14%
North Dakota	0.0444	0.0570	28%
Ohio	0.0906	0.0765	-16%
Oklahoma	0.1063	0.1245	17%
Oregon	0.1760	0.1898	8%
Pennsylvania	0.0597	0.0787	32%
Rhode Island	0.1058	0.1125	6%
South Carolina	0.1162	0.1449	25%
South Dakota	0.0432	0.0522	21%
Tennessee	0.1051	0.1104	5%
Texas	0.1328	0.1767	33%
Utah	0.0531	0.0831	56%
Vermont	0.0528	0.0665	26%
Virginia	0.1431	0.1102	-23%
Washington	0.1208	0.1090	-10%
West Virginia	0.0217	0.0819	277%
Wisconsin	0.1152	0.1316	14%
Wyoming	0.2252	0.2679	19%
United States	0.1284	0.1468	14%

Source: IPEDS, 2016

Table 6 illustrates the percent of change in the enrollment ratio by state from the base year of 2000-01 and the last year available of 2014-15. While the methodology for calculating the enrollment ratio is supported in the literature (Docampo 2007), the methodology itself is limited in that the ratio does not account for the possibility of the non-traditional community college student by only using census data for 15-24 year olds as the denominator of the ratio. Community colleges often have an average student age of older than 24 and a history of offering older, displaced workers the opportunity to return to school to update skills and education to re-enter the workforce. However, the 15-24 year age range was selected to account for dually-enrolled students and those attending beyond the first 2 years after high school and as stated earlier, consistent with the literature.

The table illustrates that from 2000-2014, enrollment in public two-year institutions increased 14% at the national level. Changes in enrollment at the state level were mixed with 40 of the 50 states showing gains in enrollment. Only three states showed a double-digit decline in enrollment: Alaska at -95%, Nevada at -24%, and Virginia at -23%. One possible explanation for Alaska's -95% decrease in community college attendance can be explained in part by the 58% increase in tuition at public community colleges. (See table 6.) As reported by Rouse (1994), community college students are sensitive to changes in tuition. The 58% increase in average in-state tuition and fees in Alaska appears to be a factor in the 95% decrease in enrollment.

Another limitation of the enrollment ratio lies within the choice of the data to examine. Though the question of accessibility for this study is focused on public higher education, in particular community colleges, students in fact have options for a better

future. Some students may choose private two-year colleges, public or private four-year colleges, or no higher education at all. Other types of institutions and the job market represent competition for community colleges in their offering of a better future to these students.

To get a better picture of accessibility, it is useful to examine metrics other than enrollment ratios. Examining changes in tuition and fees, state appropriations, and average loans illustrate the cost of access to higher education. Some students are better able to bear the cost of higher education than others due to socioeconomic status. In this manner, examination of additional metrics at the institutional level provide a picture of the consequences of reducing state funding, increasing tuition and fees, and impact of grants and loans to students selecting public two-year institutions as factors that impact student choice and accessibility to public higher education.

Table 7 illustrates the changes in tuition and fees by state for the periods 2000-2001 and 2013-2014. All tuition and fees listed in the table are stated in current dollars. This is consistent with Sullivan's methodology of using current dollars as this is "the way citizens in communities experience and remember cost changes related to community colleges." (What Is Affordable Community College Tuition?: Part I 2010a, 649). Further, it should be noted that the tuition and fees gathered are based on in-state tuition rates and do not include room and board.

Table 7

Average Tuition by State for Public Two-Year Institutions

Average Tuition - Public Two-Year Institutions- by State			
State	**2000_2001**	**2013_2014**	**% Change**
Alabama	1840.62	4218.12	129%
Alaska	1730.00	2740.00	58%
Arizona	792.33	1978.90	150%
Arkansas	1274.82	2582.09	103%
California	325.70	1237.50	280%
Colorado	1747.27	3192.13	83%
Connecticut	1863.50	3787.67	103%
Delaware	1678.33	3380.00	101%
Florida	1558.35	2735.86	76%
Georgia	1059.52	2717.48	156%
Hawaii	1062.83	2615.17	146%
Idaho	2006.67	2805.00	40%
Illinois	4997.53	3259.44	-35%
Indiana	1986.00	3605.00	82%
Iowa	2149.47	4395.94	105%
Kansas	1423.16	3217.79	126%
Kentucky	1191.31	3478.75	192%
Louisiana	880.93	3022.56	243%
Maine	2730.00	3487.14	28%
Maryland	3923.56	3358.31	-14%
Massachusetts	1913.13	4315.88	126%
Michigan	2415.44	3132.44	30%
Minnesota	2520.90	5363.55	113%
Mississippi	1047.47	2401.53	129%
Missouri	2110.87	3017.14	43%
Montana	2040.42	2952.73	45%
Nebraska	1657.14	3084.25	86%
Nevada	1395.00	2700.00	94%
New Hampshire	3886.75	7224.14	86%
New Jersey	3395.74	3948.47	16%
New Mexico	869.74	1587.84	83%
New York	2789.62	4497.03	61%
North Carolina	998.56	2512.08	152%
North Dakota	1853.50	3816.80	106%

Table 7 (continued)

Ohio	2460.76	4040.24	64%
Oklahoma	1315.25	3524.14	168%
Oregon	1633.06	4122.82	152%
Pennsylvania	4368.38	4831.56	11%
Rhode Island	1806.00	3950.00	119%
South Carolina	1776.05	4298.90	142%
South Dakota	2817.80	4805.60	71%
Tennessee	1438.31	3619.15	152%
Texas	1275.28	2276.68	79%
Utah	1636.00	3342.00	104%
Vermont	3004.00	5698.00	90%
Virginia	1172.29	3824.67	226%
Washington	1725.44	4019.82	133%
West Virginia	1562.00	3255.14	108%
Wisconsin	2270.00	4115.94	81%
Wyoming	1455.14	2570.14	77%
United States	1936.64	3493.27	80%

Source: IPEDS 2016

As illustrated in Table 7, the national average for community college tuition and fees were 80% higher in 2013-2014 than in the base year of 2000-2001. Only two states have tuition and fee decreases and those states are Illinois at -35% and Maryland at -14%. Three states have tuition and fee increases greater than 200% and those states are California with an increase of 280%, Louisiana with an increase of 243%, and Virginia with an increase of 226%. Over 26 states posted increases in tuition and fees at 100% or greater.

One reason frequently cited by public institutions for increasing tuition and fees is to make up for decreasing state appropriations. Table 8 shows the aggregate state appropriations by state for the years 2000-2001 and 2013- 2014.

Table 8

Total State Appropriations for Public Two-Year Institutions

State Appropriations - Public Two-Year Institutions- by State			
State	**2000_2001**	**2013_2014**	**% Change**
Alabama	207,864,294	291,875,565	40%
Alaska	-	-	-
Arizona	114,872,503	62,797,159	-45%
Arkansas	113,940,758	177,951,366	56%
California	1,497,997,207	2,942,539,028	96%
Colorado	125,047,497	10,117,459	-92%
Connecticut	142,975,284	247,560,574	73%
Delaware	49,215,075	68,443,941	39%
Florida	200,613,720	185,751,479	-7%
Georgia	212,494,426	330,192,560	55%
Hawaii	57,023,383	97,051,120	70%
Idaho	27,193,861	53,063,250	95%
Illinois	278,426,840	407,203,042	46%
Indiana	12,342,392	234,180,304	1797%
Iowa	151,318,276	238,776,508	58%
Kansas	90,050,030	152,492,356	69%
Kentucky	-	128,748,990	-
Louisiana	74,790,427	127,939,798	71%
Maine	31,072,558	51,585,148	66%
Maryland	144,313,117	280,894,905	95%
Massachusetts	250,573,062	310,755,306	24%
Michigan	257,618,371	291,720,859	13%
Minnesota	307,228,335	341,018,000	11%
Mississippi	188,906,475	234,576,416	24%
Missouri	62,751,213	108,649,557	73%
Montana	10,135,204	25,543,604	152%
Nebraska	86,187,822	93,678,679	9%
Nevada	21,958,000	30,028,000	37%
New Hampshire	20,635,652	40,724,415	97%
New Jersey	132,121,107	134,949,204	2%
New Mexico	118,691,111	191,627,301	61%
New York	410,298,863	687,266,631	68%
North Carolina	477,850,984	921,191,811	93%
North Dakota	17,831,954	42,598,394	139%

Table 8 (continued)

Ohio	313,038,599	414,936,823	33%
Oklahoma	137,103,941	179,870,259	31%
Oregon	202,353,190	274,945,490	36%
Pennsylvania	152,077,011	235,149,541	55%
Rhode Island	35,215,923	44,433,286	26%
South Carolina	172,235,045	116,757,940	-32%
South Dakota	10,571,973	14,557,397	38%
Tennessee	195,767,231	262,595,627	34%
Texas	855,417,746	1,124,941,322	32%
Utah	68,686,793	110,996,557	62%
Vermont	1,470,200	5,424,037	269%
Virginia	266,973,217	381,823,634	43%
Washington	212,263,336	284,921,136	34%
West Virginia	12,328,989	50,278,330	308%
Wisconsin	144,681,639	113,024,349	-22%
Wyoming	44,728,174	111,136,556	148%
United States	8,719,252,808	13,269,285,013	52%

Source: IPEDS, 2016. Data not available for Alaska and Kentucky.

As illustrated in Table 8, while tuition and fees increased by an average of 80% nationally, state appropriations increased at the lower rate of 52% nationally. Five states had state appropriation decreases: Colorado at -95%, Arizona at -45%, South Carolina at -32%, Wisconsin at -22%, and Florida at -7%. Interestingly, Colorado experienced an 83% increase in tuition and fees over the same period for a 4% change in the enrollment ratio. While Arizona cut state appropriations by -45%, institutions increased tuition and fees by 150% and sustained a decrease in their enrollment ratio of -11%. Florida had the smallest decrease in state appropriations of -7%, while tuition and fees increased by 76%. Florida's enrollment ratio decreased by -14% for the same time period.

Another important metric to examine is average student loan awarded. While student loans impact accessibility to higher education by allowing students without the ability to pay a way to enroll thus eliminating the economic obstacle many face when

trying to go to college, it must also be viewed as a consequence because the student loan is a debt that must be repaid. Students must make wise choices not only for a field of study but also for the institution in which they enroll. Within the last 2 years, two well-known private institutions have closed their doors leaving students liable for their student loan debt and possibly with no degree or a less acceptable degree (Johnson 2016, Nasiripouri 2015). In addition, students selecting well-respected public institutions may also graduate with substantial student loan debt and not find employment making what they had planned.

Table 9 reflects the average student loan awarded at public two-year institutions by state.

Table 9

Average Student Loan Awarded by State at Public Two-Year Institutions

Average Federal Student Loan - Public Two-Year Institutions- by State			
State	**2000_2001**	**2014**	**% Change**
Alabama	741	4,423	497%
Alaska	-	-	-
Arizona	2,626	3,998	52%
Arkansas	1,794	4,009	123%
California	2,493	4,629	86%
Colorado	2,424	4,811	99%
Connecticut	1,655	3,766	128%
Delaware	1,914	3,428	79%
Florida	94	5,288	5550%
Georgia	274	4,789	1646%
Hawaii	2,622	4,147	58%
Idaho	2,160	4,748	120%
Illinois	1,353	4,001	196%
Indiana	2,512	4,526	80%
Iowa	2,877	4,927	71%
Kansas	2,021	4,609	128%

Table 9 (continued)

Kentucky	1,694	4,727	179%
Louisiana	923	5,220	466%
Maine	2,486	4,971	100%
Maryland	1,791	4,939	176%
Massachusetts	1,923	3,656	90%
Michigan	2,286	4,572	100%
Minnesota	2,953	5,693	93%
Mississippi	1,887	3,590	90%
Missouri	2,054	4,504	119%
Montana	1,579	5,329	237%
Nebraska	2,120	4,362	106%
Nevada	3,355	5,258	57%
New Hampshire	3,310	5,448	65%
New Jersey	1,964	4,340	121%
New Mexico	2,153	4,234	97%
New York	2,244	4,695	109%
North Carolina	1,399	5,973	327%
North Dakota	1,905	5,791	204%
Ohio	2,042	4,805	135%
Oklahoma	1,133	4,228	273%
Oregon	2,129	5,700	168%
Pennsylvania	2,284	5,189	127%
Rhode Island	1,953	4,172	114%
South Carolina	1,582	4,501	185%
South Dakota	2,242	6,567	193%
Tennessee	835	4,065	387%
Texas	1,707	4,610	170%
Utah	949	4,362	360%
Vermont	2,000	4,695	135%
Virginia	1,150	4,494	291%
Washington	2,948	4,936	67%
West Virginia	1,092	3,979	264%
Wisconsin	2,087	4,520	117%
Wyoming	2,371	4,166	76%
United States	1,882	4,666	148%

Source: IPEDS 2016. Data for Alaska not available.

When examining table 9, it is important to note that all states reporting data experienced an increase in the average student loan amount. The national average student loan amount increased from 2000 to 2014 by 148% in current dollars. Of the 50 states, 34 states have triple digit or higher increases in the average student loan amount. The largest single increase is Florida with an increase of 5,550% in the average student loan amount, followed by Georgia with an increase of 1,646%.

In 2011, the United States Department of Education reduced the expected family income level required for students to qualify for federal grants for higher education from $32,000 annually to $23,000 annually (Association of Community College Trustees 2012). The reduced threshold for zero family contribution meant that students whose family income fell between $32,000 and $23,000 were suddenly ineligible for Pell grants to continue their education. This change in eligibility created a situation where as many as 300,000 students needed to seek a student loan to pay for part or all of the remaining semesters of their education at the community college level.

The findings for the increases in student loan indebtedness is consistent with the findings of Rouse (1994) that community college students are sensitive to changes in tuition and find community college a more affordable alternative to four-year institutions.

Accessibility to Higher Education in Other Countries

Using data from the World Bank, gross enrollment ratios for tertiary education for the years 2000 and 2010 are compared using a t-test to determine whether differences are statistically significant. The World Bank calculates the gross enrollment ratio for tertiary education as a percentage of the total population of the five-year age group beyond secondary school. One limitation of this measure is that while it includes traditional

higher education levels comprised of universities and two-year schools, the data also includes non-credit short term workforce training that is beyond the secondary education level. In spite of this limitation, it is the best measure of accessibility to higher education available at the international level. The World Bank collected data for twenty-one countries for the years 2000 and 2010. Gross enrollment ratios for the twenty-one countries can be seen in Table 10.

Table 10

Gross Enrollment Ratios for Tertiary Education 2000 & 2010

Country	Code	Gross Enrollment Ratio Tertiary Education 2000	Gross Enrollment Ratio Tertiary Education 2010
Australia	AUS	67.04	80.92
Austria	AUT	56.57	68.73
Chile	CHL	37.15	69.67
Czech Republic	CZE	28.42	64.02
Denmark	DNK	57.25	73.62
Finland	FIN	82.44	94.12
France	FRA	54.43	57.13
Hungary	HUN	35.93	60.37
Iceland	ISL	45.48	78.35
Ireland	IRL	46.24	63.05
Italy	ITA	49.35	66.20
Japan	JPN	48.74	58.08
Netherlands	NLD	53.00	65.16
Norway	NOR	69.34	72.89
Poland	POL	50.49	73.17
Portugal	PRT	48.07	65.66
Slovak Republic	SVK	28.43	56.85
Spain	ESP	57.81	78.67
Sweden	SWE	67.11	74.68
United Kingdom	GBR	58.52	59.07
United States	USA	68.14	94.23

Source: World Bank 2016.

Among the twenty-one countries identified in Table 10, the difference between gross enrollment ratios for tertiary education levels from 2000 to 2010 is statistically significant as measured by a t-test. In year 2000 (M= 52.85, SD 13.71) and year 2010 (M= 70.22, SD 10.77), t(40) = -4.5642, 0.0001 <= .05.

Further analysis of the data was performed using multiple regression to examine changes in the gross enrollment ratios against a series of independent variables. The selected independent variables are based on the literature and include public spending on tertiary education as a percentage of GDP, public spending on education (all levels) as a percentage of GDP, taxes on the average worker, and expenditures on research and development as a percentage of GDP (Docampo 2007). The national unemployment rate is included because of its historical context as influencing higher education enrollment in the United States. While empirical studies show mixed results, community colleges in the United States often report increases in enrollment that positively correlate with increases in the unemployment rate (Chen 2016). Also, a dummy variable is included as an independent variable. The combination of variables accounted for a significant portion of the variance, Adj. R2 = 0.5667, with an F value of (6,33) = 9.5; 0.0000 < .05. Of the independent variables tested, only public spending on tertiary education as a percentage of GDP and the dummy variable were statistically significant as shown in Table 11 below.

Table 11

Prediction of Changes in Gross Enrollment Ratio Tertiary Education

Variables	Coefficients	P
Public Spending on Tertiary Education as a Percentage of GDP	16.434	0.022
	(6.834)	
Research & Development	3.402	0.122
	(2.140)	
Public Spending on Education as a Percentage of GDP	-2.144	0.417
	(2.608)	
Unemployment Rate	0.295	0.476
	(0.410)	
Taxes on Average Worker	0.011	0.990
	(0.158)	
Dummy Variable	13.618	0.000
	(3.218)	
Constant	36.4	0.001
	(9.899)	
Observations	40	
Adjusted R-squared	0.566	

Standard errors in parentheses
p<0.05

Public spending on tertiary education is the only variable tested that is statistically significant at $p = 0.022 < 0.05$. While it is expected that public spending on tertiary education would have a positive effect on accessibility as measured by the gross enrollment ratio, the significance of the dummy variable ($p = 0.000 < 0.05$) would indicate that there are other factors that would have a positive effect on accessibility. The amount the government spends on public higher education has a direct impact on affordability of higher education in terms of keeping costs low to students (The President's Commission on Higher Education, 1947; Sullivan 2010; Barreno and Traut 2012).

Public spending on education (all levels) as a percentage of GDP is not statistically significant at $p = 0.417$. If the importance that a society places on education is measured by the amount of public spending on all levels of education, then it would be expected that this variable would have shown statistical significance. One possible explanation is that while societies view elementary and secondary education as a public good and are willing to make a public investment, the same does not necessarily hold true for tertiary education, which is often regarded as a mixed good at best. Higher education students in many countries are expected to bear the burden of their tuition costs, so this measure of spending when divided between the three levels of education is divided in favor of lower levels with a smaller portion going to tertiary education.

Taxes on the average worker was not statistically significant at $p = 0.990$. It could be reasoned that countries that make a public investment in tertiary education, that taxes on the average worker would also be an indicator of enrollment. However, its lack of statistical significance in this case could be related to variations in taxing structures in the countries in the sample. A country that places more tax burden on corporations and businesses rather than individuals would not have a strong relationship between taxes on the average worker and tertiary enrollment.

Expenditures on research and development as a percentage of GDP was another variable that was not statistically significant at $p = 0.122$. While Docampo (2007) found many countries with a high gross enrollment ratio for tertiary education also had a high expenditure on research and development, this study found that expenditures on research and development as a percentage of GDP is not an indicator of higher education enrollment. One possible explanation is the way in which research funds are allocated at

the higher education level. Typically, research grants, whether private or public, may enhance an educational opportunity for a higher education undergraduate or graduate student, but these funds are earmarked for specific purposes. The institution receiving the research grant may not use the funds as part of their general budget in such a way as to reduce tuition costs for enough students to realize a significant gain in enrollment.

The most interesting finding of this regression analysis was that the coefficient for unemployment rate is not statistically significant at $p = 0.476$. The traditional belief in the United States has been that when people are unemployed, they return to school for training and education to help them to re-enter the workforce. The lack of significance of the unemployment variable could be explained in part because other countries may not have the governmental safety nets such as public funds that allow the unemployed to return to college for the training and education that will help them to re-enter the workforce. Another possible explanation is that there might be a lag between the onset of unemployment and the commitment to obtain a new degree. It seems reasonable for people to continue hoping to find a job for a while before deciding to enroll for a new degree, especially because a higher portion of the burden of higher education has been shifted to the students making it more difficult to enter college especially when income and savings are lacking. The unemployment rate appears to have no effect on gross enrollment (Craft, et al. 2012).

CHAPTER V – SUMMARY AND CONCLUSIONS

Introduction

The promise of the American public community college has been eliminating barriers and making higher education accessible. When community colleges were founded, the main barrier was geography. Half a century after the first community colleges were founded, President Truman charged the nation with making public higher education accessible to all Americans that have the will and the capability of pursuing higher education by mitigating other barriers such as race, religion, and socioeconomic factors. He made public higher education a social responsibility in an effort to increase the human capital resources of the nation. President Truman further suggested that keeping costs low is important to accessibility for the economically disadvantaged. The country responded over the decades to support higher education through state and local appropriations and with federal support through appropriations like Pell grants, the Carl Perkins Act, and the G.I. Bill.

Changes in public funding have occurred in the form of lower local appropriations, lower state appropriations, and the shifting allocation of federal support from grants to loans. Furthermore, there is a movement to shift the nature of state appropriations toward performance metrics rather than enrollment, which will further change the way institutional budgets are comprised. In response to these changes, tuition and fees at institutions have increased. It is important to assess the effect of changes in accessibility to public higher education. A series of three research questions are used to address to the impact on accessibility. The first research question examines data at the student level, the second research question examines data at the institutional level, and

the third research question examines data at the institutional level in other countries. A summary of findings for each of these questions can be found in the following sections.

Factors that Influence Student Choice of Higher Education

Using data from the National Longitudinal Survey of Youth 1997, student choice of higher education is examined against a variety of variables. Students have a choice of community college, four-year university, or no higher education, and the choices are compared against each other with the selected variables. When comparing student choice of four-year university over no higher education and community college over no higher education, household income is statistically significant and has a positive effect on student selection in both cases. This finding is consistent with Rouse's 1994 study as well as other studies conducted by Kane (1995) and Sullivan (2010a).

It is important for policy makers and institutional leaders to be mindful of the challenges faced by economically disadvantaged students. The high tuition high aid model described by Sullivan (2010a) and Georgiana and Jones (2007) has allowed economically disadvantaged students to seek higher education opportunities. However, as aid shifts from grants to loans, this model may no longer work for institutions if students become unwilling to pursue higher education if the only way to gain access is through incurring large amounts of student debt.

Another variable of interest is the ASVAB score, used as a proxy for cognitive ability. While this variable is statistically significant in each of the three comparisons of student choice of higher education, it only has a positive effect on selection in two of the comparisons. When students are given a choice between attending a four-year university or no higher education, or a choice between attending community college or no higher

education, the ASVAB score has a positive impact on student choice. This is expected as students with higher cognitive abilities tend to have more options for paying for higher education, often through merit-based scholarships and grants.

However, when given a choice between community college and four-year university, the ASVAB score has a negative impact on student choice of community college. While this outcome is to be expected as students with higher cognitive abilities have more opportunities for merit-based scholarships and grants, the leadership of community colleges should consider the amounts and structure of merit-based aid they offer if their intent is to attract students with higher cognitive abilities. Community colleges are in direct competition with four-year universities as well as other institutions, and in order to attract these students to enroll and persist their scholarship offers will need to be competitive.

Changes in Public Funding for Higher Education

Whereas public community colleges have historically received the majority of their funding through state and local appropriations, data for this question was obtained at the institution level through IPEDS and aggregated at the state level. State enrollment ratios for public community colleges are compared along with average tuition and fees for in-state students, total state appropriations, and average student loan awarded for the years 2000-2001 and 2013-2014. Changes in enrollment ratios over the period from 2000-2001 to 2013-2014 were mixed with nine states having an overall decrease in enrollment. The nine states with decreases in enrollment are Alaska, Arizona, California, Florida, Illinois, Nevada, Ohio, Virginia, and Washington. Five states have measured

increases in excess of 100% which include Idaho, Indiana, Kentucky, Louisiana, and Maine.

For the same time period, the changes in state appropriations are mixed as well. Five states, Arizona, Colorado, Florida, South Carolina, and Wisconsin, decreased state appropriations to community colleges. A few states increased state appropriations to community colleges to include Indiana at 1,797%, Montana at 152%, North Dakota at 139%, Vermont at 269%, West Virginia at 308%, and Wyoming at 148%. The remainder of states have modest increases.

Interestingly, the largest changes were in the metrics of average tuition and average student loan awarded. Only two states, Illinois and Maryland, had decreases in average tuition. All other states had increases in average tuition with 26 states showing increases in the in excess of 100%. It would appear that with further examination, the modest increases in state appropriations did not keep pace with costs to operate public institutions, and institutions made up the shortfalls with increases to the students in the form of tuition and fees.

However, the most dramatic changes are in average federal student loan awarded. All states have increases in the average student loan awarded. Thirty-four of the fifty states had triple digit increases to include Florida with a 5,550% increase, Georgia with a 1,646% increase, and Louisiana with a 455% increase. Increases in tuition and fees, changes in fee structures favoring full-time status in order to receive aid, changes in income thresholds to receive grants, the elimination of private banks as lenders of federal student loans, and increases in per hour costs that make part-time status unrealistic for

low-income students have created a mix of factors whereby the student choice to seek higher education is costly.

Inherent in the idea of accessibility to public higher education is that in order to make higher education accessible for the economically disadvantaged or "working poor," higher education must remain affordable. Perhaps affordability should be defined not only as the ability to pay tuition upon enrollment but also include the ability to repay the student loan after graduation. While nationwide there is an overall increase in enrollment at public community colleges, the increases in tuition and fees coupled with the modest increases in state appropriations would seem to indicate that enrollment gains are influenced by the availability of student loans rather than state and local policy decisions to invest in community colleges to keep them affordable.

The "high-tuition high-aid" model described by Sullivan supports this observation. The high-tuition high-aid model adopted by many higher education institutions has been a workable solution to budgetary issues but only because of student financial aid (Sullivan, 2010a; Georgiana and Jones, 2007; Hossler, et al. 1997). It must also be considered that while maximum federal grant amounts to students have remained static for many years, the numbers of students eligible for the maximum federal grant amount has declined due to changes in family income and family contribution thresholds. Furthermore, there has been a shift in the composition of the federal student aid model from grants to loans. Students who are economically disadvantaged have fewer choices for how to pay for higher education and feel the impact of heavy student loans for a much longer time than students from families with more income.

The United States Department of Education monitors student loan default rates and penalizes institutions when default rates become too high. Also, borrowers are penalized individually for non-payment of student loans. While these steps are certainly necessary to maintain the overall viability of the student loan system, additional actions could be useful as well. For instance, a greater commitment of policymakers at funding higher education to keep costs and debt levels low would be a proactive measure towards accessibility and affordability rather than reactionary measures that scrutinize institutions and borrowers for non-payment after the student loan debt is incurred.

Accessibility to Higher Education in Other Countries

Using data from the World Bank, accessibility to higher education is examined. In the tertiary education measure published by the World Bank, this figure includes both traditional for-credit enrollment in higher education as well as short-term workforce training offered as non-credit. The aggregation of this data made makes it difficult to draw any conclusions regarding traditional higher education enrollment in other countries. However, a multiple regression was used to examine changes in the gross enrollment ratios against a series of independent variables selected from the literature.

As might be expected, public spending on tertiary education is statistically significant as the regression analysis reveals. Public investment in higher education has a direct effect on accessibility by creating opportunities to earn credentials. The surprise result is that the variable for unemployment rate is not statistically significant. In the United States, college leaders tend to expect an increase in enrollment when unemployment rates are high, yet analysis of this sample does not yield support for this idea.

When looking at factors that influence accessibility to higher education, public investment directly supports accessibility. Policy makers in other countries should consider increasing public investment if the goal is an educated populace and they wish to support the human capital resources of their country.

Implications

It is difficult to discuss accessibility to higher education without addressing cost and affordability. An area of concern is the level of student loan debt, which is determined to be over $1 trillion dollars (Lucca, Naudauld, and Shen 2015). While that figure certainly has implications at the national level, it has implications at the individual level as well. The typical college graduate of 2015 left college with an average of $35,000 in student loan (Sparshott 2015). This level of debt for graduates who are qualified for entry-level jobs places a burden on young workers that will have lasting effects on their ability to support themselves and their families. It is not beyond reason that institutions will see enrollment decreases as students respond to high tuition costs with an unwillingness to incur substantial student loan debt.

In the future, state support of public higher education and community colleges in particular will continue to change. State support of other initiatives such as healthcare, prison systems, and primary and secondary education all make demands upon state budgets. Further, performance-funding is a reality in many states and in all areas of public funding, not just higher education, because it offers lawmakers a rubric for judging budgetary requests. Considering the low to moderate growth in enrollment and mixed results on state appropriations for higher education, institutions will need to seek an alternative to the high-tuition high-aid model for higher education budgets.

Some states are making strides in the effort to level the playing field and keep accessibility a policy goal by new programs aimed at keeping community college affordable. For example, institutions and policy makers in Tennessee have initiated a program to maintain accessibility called the Tennessee Promise. This initiative seeks to offer two years of tuition-free education at a public two-year institution in Tennessee (Tennessee Student Assistance Corporation n.d.). While there are some additional criteria for the program, the overall goal is to maintain accessibility to higher education through public investment and by leveraging other funding sources available to students without the use of student loans.

Historically, barriers to higher education have included location, socioeconomic factors, gender, religion, and race. Through the growth of public and private higher education institutions across the country and more recently through the integration of technology, the location barrier to higher education has been addressed. Through legislation starting in the Civil Rights era, gender, religion and race barriers have been addressed to make sure that institutions do not deny access based on these factors. However, it appears that the socioeconomic barrier still exists for many and that some of the mechanisms put in place to mitigate these barriers such as public funding and aid programs need further attention.

BIBLIOGRAPHY

Alexander, F. King, Thomas Harnisch, Daniel Hurley, and Robert Moran. 2010. "Maintenance of Effort: An Evolving Federal-State Policy Approach to Ensuring College Affordability." *Journal of Education Finance* (ASBO International) 36 (1): 76-87.

American Association of Community Colleges. 2014. "Fast Facts." *American Association of Community Colleges.* April. Accessed July 5, 2014. http://www.aacc.nche.edu/AboutCC/Documents/Facts14_Data_R3.pdf.

—. 2016. *Fast Facts.* February. Accessed August 31, 2016. http://www.aacc.nche.edu/AboutCC/Pages/fastfactsfactsheet.aspx.

Association of Community College Trustees. 2012. "Pell Grants." *Association of Community College Trustees.* Accessed September 13, 2016. http://www.acct.org/pell-grants.

Barreno, Yvette, and Carol Ann Traut. 2012. "Student Decisions to Attend Public Two-Year Community Colleges." *Community College Journal of Research and Practice* 36: 863-871.

Baum, Sandy, Charles Kurose, and Michael McPherson. 2013. "An Overview of American Higher Education." *The Future of Children* (Princeton University) 17-39.

Chen, Grace. 2016. "Why Student Enrollment Rises as the Economy Falls." *Community College Review.* New York, NY, April 5. Accessed July 20, 2016. http://www.communitycollegereview.com/blog/why-student-enrollment-rises-as-the-economy-falls.

Cohen, Arthur M., Florence B. Brawer, and Carrie B. Kisker. 2014. *The American Community College.* San Francisco: Jossey-Bass.

Craft, Kim, Joe Baker, Brent Myers, and Abe Harraf. 2012. "Tuition Revenues and Enrollment Demand: The Case of Southern Utah University." *Professional File.* Edited by Gerald McLaughlin. Prod. Association for Institutional Research. Tallahassee, FL. Accessed July 20, 2016. http://files.eric.ed.gov/fulltext/ED532857.pdf.

Docampo, Domingo. 2007. "International Comparisons in Higher Education Funding." *Higher Education in Europe* 369-386.

Dodds, Anneliese. 2011. "The British higher education funding debate: the perils of 'talking economics'." *London Review of Education* 317-331.

Eicher, Jean-Claude, and Thierry Chevaillier. 1996. "Rethinking the financing of post-compulsory education." In *Higher Education in an International Perspective: Critical Issues*, by Zaghloul Morsy and Philip G. Altbach, 90-107. Geneva, Switzerland: UNESCO: International Bureau of Education.

Elsner, Paul A., George R. Boggs, and Judith T. Irwin. 2008. *Global Development of Community Colleges, Technical Colleges and Further Education Programs. .* Washington, D.C.: Community College Press.

Fisher, Sandra. 2005. *Is There a Need to Debate the Role of Higher Education as the Public Good?* Dublin Institute of Technology, Dublin: Dublin Institute of Technology. Accessed June 7, 2015. http://level3.dit.ie/html/issue3/fisher/fisher.pdf.

Georgianna, Daniel, and Robert T. Jones. 2007. "Privatizing the Benefits from Higher Education and Its Effect on Access." *American Academic* 9-23.

Gilbert, Claire Krindl, and Donald E. Heller. 2013. "Access, Equity, and Community Colleges: The Truman Commission and Federal Higher Education Policy from 1947 to 2011." *The Journal of Higher Education* 417-443.

Grubb, W. Norton. 1989. "The Effects of Differentiation on Educational Attainment: The Case of Community Colleges." *The Review of Higher Education* 349-374.

Hardiman, Kate. 2016. "This one graph shows why the higher ed bubble may be close to bursting." *The College Fix*, February 1. Accessed September 20, 2016. http://www.thecollegefix.com/post/26010/.

Hearn, James C., and Janet M. Holdsworth. 2005. "Federal Student Aid: The Shift From Grants to Loans." In *Public Funding of Higher Education: Changing Contexts and New Rationales*, by Edward P. St. John and Michael D. Parsons, 40-59. Hopkins Fulfillment Service.

Hendrick, Ruth Zimmer, William H. Hightower, and Dennis E. Gregory. 2006. "State Funding Limitations and Community College Open Door Policy: Conflicting Priorities?" *Community College Journal of Research and Practice* 627-640.

Hossler, Don, Jon P. Lund, Jackie Ramin, Sarah Westfall, and Steve Irish. 1997. "State Funding for Higher Education: The Sisyphean Task." *The Journal of Higher Education* 68 (2): 169-190.

Johnson, Derek. 2016. "Dispatches from ITT Tech Closing: Students Suffer Consequences." *Good Call*, September 16. Accessed September 16, 2016.

https://www.goodcall.com/news/side-itt-tech-closing-students-suffer-consequences-08593.

Joshi, Prathibha V., Kris A. Beck, and Christian Nsiah. 2009. "Student Characteristics Affecting the Decision to Enroll in a Community College: Economic Rationale and Empirical Evidence." *Community College Journal of Research and Practice* 33: 805-822.

Kane, Thomas J., and Cecelia Elena Rouse. 1999. "The Community College: Educating Students at the Margins Between College and Work." *Journal of Economic Perspectives* (American Economic Association) 13 (1): 63-84.

Kane, Thomas. 1995. *Rising public college tuition and college entry: How well do public subsidies promote access to college.* Cambridge, MA: The National Bureau of Economic Research. Accessed July 20, 2016. http://www.nber.org/papers/w5164.pdf.

Katsinas, Stephen, and Terrence Tollefson. 2008. *State Funding for Community Colleges: Perceptions from the Field.* Tuscaloosa: University of Alabama Press.

Kaye, Tony, and Greville Rumble. 1996. "Open universities: a comparative approach." In *Higher Education in an International Perspective: Critical Issues*, by Zaghloul Morsy and Philip G. Altbach, 46-58. Geneva, Switzerland: UNESCO International Bureau of Education.

Key, Scott. 1996. "Economics or Education: The Establishment of American Land-Grant Universities." *Journal of Higher Education* 196-220.

Latiner Raby, Rosalind, and Edward J. Valeau. 2009. *Community College Models.* Springer.

Lucca, David O., Taylor Naudauld, and Karen Shen. 2015. "Credit Supply and the Rise in College Tuition: Evidence from the Expansion of Federal Student Aid Programs." Staff Report, Federal Reserve Bank of New York, New York.

Morsy, Zaghloul, and Philip G. Altbach, . 1996. *Higher Education in An International Perspective.* Geneva: UNESCO: International Bureau of Education.

Nasiripour, Shahien. 2015. "Corinthian Colleges Files for Bankruptcy." *Huffington Post*, May 5. Accessed September 16, 2016. http://www.huffingtonpost.com/2015/05/04/corinthian-colleges-bankruptcy_n_7205344.html.

National Center for EducationStatistics. n.d. *Integrated Postsecondary Data System.* Accessed June 14, 2015. https://nces.ed.gov/ipeds/about/.

Nelson, Libby A. 2011. "Loan Changes, Sans Congress." *Inside Higher Ed*, October 26. Accessed September 13, 2016. https://www.insidehighered.com/news/2011/10/26/obama-proposes-changes-student-loan-programs.

Nigliazzo, M.A. 1986. "The fading vision of the open door." *New Directions for Community Colleges* 33-40.

Oreopoulos, Philip, and Uros Petronijevic. 2013. "Making College Worth It: A Review of the Returns to Higher Education." *The Future of Children* 41-65.

Rouse, Ceceilia Elena. 1994. "What to Do After High School: The Two-Year versus Four-Year College Enrollment Decision." In *Choices and Consequences: Contemporary Policy Issues in Education* , by Ronald H. Ehrenberg, 59-88. ILR Press.

Smith, Adam. 1976. *The Wealth of Nations.* Oxford University Press.

Sparshott, Jeffrey. 2015. "Congratulations, Class of 2015. You're the Most Indebted Ever (For Now)." *The Wall Street Journal*, May 8. Accessed September 20, 2016. http://blogs.wsj.com/economics/2015/05/08/congratulations-class-of-2015-youre-the-most-indebted-ever-for-now/.

Stoetzer, Ethan. 2015. "Federal Reserve report finds link between increased federal aid, rising tuition." *The USA Today*, August 20. Accessed September 20, 2016. http://college.usatoday.com/2015/08/20/report-federal-aid-rising-tuition/.

Sullivan, Patrick. 2010a. "What Is Affordable Community College Tuition?: Part I." *Community College Journal of Research and Practice* 645-661.

Sullivan, Patrick. 2010b. "What Is Affordable Community College Tuition?: Part II." *Community College Journal of Research and Practice* 34 (9): 687-699.

Tennessee Student Assistance Corporation. n.d. *Tennessee Promise.* Accessed September 18, 2016. http://tennesseepromise.gov/about.shtml.

The President's Commission on Higher Education. 1947. *Higher Education for American Democracy: Establishing the Goals.* Vol. 1. 5 vols. New York, New York: Harper and Brothers.

—. 1947. *Higher Education in America: Financing Higher Education.* Vol. 5. 5 vols. New York: Harper and Brothers.

Thelin, John. 2004. "Higher Education and the Public Trough." In *Public Funding of Higher Education: Changing Contexts and New Rationales*, by Edward P. St. John and Michael D. Parsons, 21-39. Baltimore: The Johns Hopkins University Press.

Tilak, Jandhyala B. G. 1996. "The privatization of higher education." In *Higher Education in an International Perspective*, by Zaghloul Morsy and Philip G. Altbach, 59-71. Geneva, Switzerland: UNESCO: International Bureau of Education.

Tollefson, Terrence A. 2009. "Community College Governance, Funding, and Accountability: A Century of Issues and Trends." *Community College Journal of Research and Practice* (Taylor & Francis Group, LLC) 386-402.

United States Department of Education. 2015. "Digest of Education Statistics: Table 330.10. Average undergraduate tuition and fees and room and board rates charged for full-time students in degree-granting postsecondary institutions, by level and control of institution: 1963-64 through 2014-15." *National Center for Education Statistics.* Accessed September 12, 2016. https://nces.ed.gov/programs/digest/d15/tables/dt15_330.10.asp?current=yes.

—. n.d. *FastFacts.* Accessed August 31, 2016. http://nces.ed.gov/fastfacts/display.asp?id=372.