ASSOCIATION BETWEEN TUITION DISCOUNTING AND INSTITUTIONAL GOALS AT THE LARGEST MIDWESTERN PRIVATE UNIVERSITIES

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ASSOCIATION BETWEEN TUITION DISCOUNTING AND INSTITUTIONAL GOALS AT THE LARGEST MIDWESTERN PRIVATE UNIVERSITIES

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ABSTRACT

ASSOCIATION BETWEEN TUITION DISCOUNTING AND INSTITUTIONAL GOALS AT THE LARGEST MIDWESTERN PRIVATE UNIVERSITIES

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This study examined differences in institutional aid among the largest 4-year privatenon-profit (PNP) institutions in the Midwest. The researcher determined the levels of association between institutional grants and measures of institutional goals, determined the levels of association between institutional grants and measures of institutional goals when controlling for the effects of total-full time undergraduate headcount and institutional wealth and determined whether the practice of tuition discounting has benefited the largest 4-year PNP institutions in the Midwest over the past decade.

The variables of the study were categorized as institutional goal and institutional grant variables. Institutional goal variables were further categorized as measures of diversity, enrollment and financial goals. The study population was the 30 largest 4-year PNP institutions having a primary location in a Midwest state and having students between the ages of 18 and 24 constituting at least 85% of undergraduate enrollment. Pearson's product-moment coefficients were computed to determine strength of associations. Profiles of the

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study colleges were created, including data for each of the measured institutional goal and grant variables.

The practice of tuition discounting was associated with various positive changes in diversity, enrollment and financial outcomes over the period of this study. The primary findings of the study are summarized in five conclusive statements: 1) different levels of institutional grants have had different levels of associations with institutional goals and institutional wealth had a significant impact on these associations, 2) higher discounts were not generally associated with greater changes in institutional goals, 3) associations between institutional goals through the use of institutional grants is fading, 4) total full-time undergraduate headcount had little impact on the associations between institutional goal variables, suggesting the findings are consistent across a range of institutional as measured by enrollment, 5) tuition and fees and institutional wealth have grown at significant rates, yet the population lagged the national averages in racial and ethnic diversity and socioeconomic diversity at all 4-year PNPs. Implications of these findings for policy and further research were discussed.

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CHAPTER I

INTRODUCTION

Over the past half century, federal, state, and institutional funded merit-based and need-based grant programs have helped millions of students pay for college and have provided steady revenues for colleges and universities. Merit-based grants, defined as financial aid given to students to reward academic merit or special talent, have existed since the 17th century. Need-based grants, defined as financial aid given to needy students, were created in the early 20th century and subsequently expanded largely through the G.I. Bill and the Higher Education Act of 1965. Later, states created their own grant programs. In 2010, freshmen recipients of federal, state, and institutional grants at 4-year private not-for-profit (PNP) institutions received an average of \$16,260 per student (Snyder & Dillow, 2013, Table 388).

The three providers, federal government, state government, and institutions have had dissimilar priorities and goals. Federal aid has been intended to benefit society by providing access, equity, and national security. State aid has been intended to ensure a stable job force and sufficient tax revenues. Institutional aid has been intended to meet enrollment initiatives that maximize net revenues.

At 4-year PNP colleges and universities, institutional grants have constituted the primary source of financial assistance. In 2010, for example, 80% of the freshman at these schools received an institutional grant. The aggregate amount of institutional grants exceeded

\$5.8 billion, the average (mean) institutional grant was \$14,316, and institutional grants constituted 62% of the grant assistance received by these students (Snyder & Dillow, 2013, Table 387). In comparison, only 40% of freshmen attending 4-year public colleges and universities received an institutional grant. For these students, institutional grants averaged \$4,630 and constituted just 35% of their total grant aid (2013a). As these data verify, institutional grants have been more prevalent at PNP institutions.

Statement of the Problem

Despite increases in institutional grants, college has become less affordable for many students. Over the past decade, two factors were especially relevant. First, using inflation-adjusted dollars, the annual published price of tuition and fees at 4-year public institutions increased an average of 51% whereas it increased 33% at 4-year PNP institutions. Second, institutional grant awards, although increasing in actual value, did not increase at the same pace as published prices (Snyder & Dillow, 2013, Table 381). Thus, the net price, defined as the published price minus federal, state, and institutional grants and educational tax benefits, for freshmen at 4-year public and 4-year PNP institutions increased an average of 53% and 22%, respectively. Without adjusting for inflation, net prices at 4-year PNP and public institutions over the last decade increased 96% and 66%, respectively (Baum & Ma, 2013, Table 2). These inflated prices are affecting both perceptions and reality about the affordability of college. As such they jeopardize access, equity, and enrollments and prompt federal and state policymakers and institutional administrators to make increasingly difficult strategic choices regarding student aid.

Tuition discounting, the art and science of establishing a net price that will maximize tuition revenue while achieving enrollment goals, has been a growing practice since the

1970's, especially at 4-year PNP institutions (Davis, 2003). Compared to other types of institutions, 4-year PNPs often have several distinct and at times overlapping tuition discounting goals. Examples include increasing the number of low income and other underrepresented students, increasing the number of high academic achievement or other special talent students, and maximizing net revenues (Redd, 2000). Tuition has generally accounted for at least 75% of all revenues at 4-year PNP institutions (Aud, et al., 2011, p. 134). Moreover, tuition price, directly under the control of private, not-for-profit college enrollment administrators and their Board of Trustees, can be easily manipulated to assist the attainment of enrollment goals (Lasilla, 2010, p. 28). Therefore, it is imperative that administrators carefully manage tuition discounting strategies; failing to do so results in a loss of net revenues and ultimately jeopardizes an institution's future. When colleges are forced to close, opportunities for education are lost and the nation and society as a whole suffer (Baum, Ma, & Payea, 2013).

Unfortunately the effects of tuition discounting strategies at the largest 4-year PNP institutions in the Midwest have not been documented and analyzed. The absence of empirical evidence is problematic because it increases uncertainty; that is, administrators cannot reasonably predict the consequences of their actions. Concurrently, the information void elevates risk, the possibility that decisions will be detrimental to the institution, the decision makers, or both (Kowalski, Lasley, & Mahoney, 2008).

Purpose of the Study

The purpose of this study was to generate data and reach conclusions that will enhance the ability of administrators to improve institutional financial aid decisions. Specifically, the research (a) examined differences in institutional grants among the largest 4year PNP institutions in the Midwest, (b) determined the level of association between institutional grants and measures of institutional goals (c) determined the level of association between institutional grants and measures of institutional goals when controlling for the effects of *total full-time undergraduate headcount* and *institutional wealth* and (d) determined whether the practice of tuition discounting has benefited the largest 4-year PNP institutions in the Midwest over the past decade.

The following three research questions, applied to the study population, guided the inquiry.

- 1. What are the characteristics of each institution as described by internal grant and goal variables?
- 2. What levels of association existed between the institutional grant variables and the institutional goal variables when (a) no data were adjusted; (b) differences in total full-time undergraduate headcount were controlled; (c) differences in *institutional wealth* were controlled?
- 3. Has the practice of tuition discounting benefited the largest 4-year PNP institutions in the Midwest?

Significance of Study

Findings and conclusions reported in this document can be used to facilitate data driven decision making by university administrators, especially at private institutions similar to those in the defined study population. Also, the results can inform state and federal policymakers who influence financial aid programs and provide general oversight for institutional aid. Last, this study adds depth and breadth to the existing financial aid knowledge base by virtue of specifically examining levels of association between institutional grants and select institutional goals at the largest 4-year PNP institutions in the Midwest.

Summary of Methods

Study Population

The defined population for this study was the 30 largest 4-year PNP institutions having a primary location in a Midwest state and having students between the ages of 18 and 24 constituting at least 85% of undergraduate enrollment. As defined here, the Midwest states included Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin. Members of the study population are listed in Appendix A. These states are representative states to the Midwest Association of Student Financial Aid Administrators (MASFAA).

Data Collection

Institutional grant measures and measures of racial, ethnic, and socioeconomic diversity, pricing, enrollment, retention, academic quality, and *institutional wealth* were collected from the U.S. Department of Education's Integrated Postsecondary Education Data System (IPEDS) for time-period A and time-period B. To alleviate 1-year exceptions or anomalies, the 3-year average for each variable was used for time-periods A and B.

Data Analysis

Research Question 1 was answered using measures of central tendency and frequency distributions to describe each of the data elements. Also, measures of variability were used to describe the extent to which the data values differed from each other, their consistency, and the accuracy of the central tendency descriptions. Part (a) of Research Question 2 was answered using Pearson product moment correlations to assess the level of association between each of the variables of this study. Scatter plots of the data points were examined to visually determine linearity between the variables. "The Pearson correlation coefficient describes the linear relationship between two interval variables, two ratio variables, or one interval and one ratio variable" (Heiman, 2006, p. 155). Use of the Pearson correlations in this fashion is purely descriptive and no conclusions about causality can safely be made (Kachigan, 1991, p. 4). Part (b) of Research Question 2 was answered using partial correlations to assess the level of association between the variables of this study holding *total full-time undergraduate headcount* constant. Part (c) of Research Question 2 was answered using partial correlations to assess the level of association between the variables of this study holding *total full-time undergraduate headcount* constant. Part (c) of Research Question 2 was answered using partial correlations to assess the level of association between the variables of this study holding *institutional wealth* constant. Questions 1 and 2 were answered for both time-periods A and B. Question 3 was answered using correlations to assess the levels of association of the changes between each of the variables from time-periods A and B considering differences between sub-groups of institutions.

Data Reporting

Levels of association were determined by calculating correlation coefficients and applying them as descriptive statistics as specified by Cohen and Cohen (1983); *small* associations were identified by correlation coefficients with absolute values from .01 to .29, *medium* associations were identified by correlation coefficients with absolute values from .30 to .49, and *large* associations were identified by correlation coefficients with absolute values of .50 or greater.

Definitions of Terms

The following terms were used in this study:

<u>ACT.</u> A widely used standardized assessment which measures educational development and readiness to pursue college-level coursework in English, mathematics, natural science, and social studies.

<u>Financial need.</u> A measure of the gap between the price of higher education and the student's financial resources for paying for higher education.

<u>For credit</u>. The formal recognition of attendance or performance in an instructional activity (course or program) that can be applied toward the requirements for a bachelor's degree. <u>Freshman</u>. A student who had no prior postsecondary experience attending an institution for the first time at the undergraduate level who was enrolled in courses for 12 or more semester credits, or 12 or more quarter credits, or 24 or more contact hours a week each term and recognized by the institution as seeking a degree, certificate, or other formal award as of the institution's fall reporting period deadline or October 15, whichever came first. This included students enrolled in academic or occupational programs. It also included students enrolled in the fall term who attended college for the first time in the prior summer term, and students who entered with advanced standing (college credits earned before graduation from high school).

<u>Institutional goals.</u> The specified ends, outputs, and priorities established for a single college or university (Peterson, 1970, p. 3).

<u>Institutional grants.</u> The monetary value of non-repayable grants (in the form of scholarships, grants, and/or fellowships) awarded to freshmen and funded by the institution and/or individual departments within the institution. This included institutional funded grants targeted to freshmen for which the institution designated the recipient.

Integrated Postsecondary Education Data System (IPEDS). A system of interrelated surveys conducted annually by the U.S. Department's National Center for Education Statistics (NCES). NCES gathers information from every college, university, and technical and vocational institution that participates in the federal student financial aid programs. The Higher Education Act of 1965, as amended, requires that institutions that participate in federal student aid programs report data on enrollments, program completions, graduation rates, faculty and staff, finances, institutional prices, and student financial aid. These data are made available to students and parents through the College Navigator college search web site and to researchers and others through the IPEDS Data Center.

<u>Mass customization</u>. Meeting the demands of individual students through the use of flexible processes, pricing and organizational structures to produce individually customized experiences at the low cost of mass production system (Jaaron & Backhouse, 2014). <u>Merit-based aid.</u> Student financial aid that is allocated on the basis of academic merit or special talent.

<u>Need-based aid.</u> Student financial aid that is allocated on the basis of financial need. <u>Price sensitivity.</u> The degree to which the price of attending an institution effects students' decisions to enroll.

<u>Standard Academic Test (SAT).</u> The SAT is a standardized assessment of critical reading, mathematical reasoning, and writing skills. The SAT is widely used for evaluating a student's college readiness.

<u>Student financial aid.</u> Funding that is intended to help students pay education-related expenses including tuition and fees, room and board, and related travel and personal

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expenses. Funding can be provided in the form of grants, tuition waivers, work-study, and/or loans.

<u>Time-period A.</u> The 3-year period marking the beginning point in time for the variables of this study as defined in Table 1.

<u>Time-period B.</u> The 3-year period marking the ending point in time for the variables of this study as defined in Table 1.

<u>Tuition discounting.</u> A phrase used to refer to the practice of awarding institutional grants to students to establish a net price that will maximize tuition revenue while achieving enrollment goals (Davis, 2003).

Undergraduate. A student enrolled in a 4 or 5-year bachelor's degree program.

<u>Value proposition</u>. An explicit value promise that reflects a rigorous understanding of the benefits students want, their willingness to pay for those benefits and the ability of the institution to deliver those benefits (Lanning & Michaels, 1988).

Definitions of Terms – Institutional Grant Variables

<u>Average monetary value for the freshmen class.</u> The average amount of institutional grant per freshman, calculated as follows:

Average monetary value for the freshmen class = total monetary value of institutional grants for freshmen / number of freshmen. (1)

<u>Average monetary value per freshman grant recipient.</u> The average amount of institutional grant per freshman grant recipient, calculated as follows:

Average monetary value per freshman grant recipient = total monetary value of institutional grants for freshmen / number of freshmen who received at least \$1 of institutional grant. (2) <u>Percentage of freshmen grant recipients.</u> The percentage of freshmen who received an institutional grant, calculated as follows:

Percentage of freshmen grant recipients = number of freshmen who received at least

\$1 of institutional grant / number of freshmen. (3)

Freshmen discount rate. The percentage discount rate calculated as follows:

Freshmen discount rate = average monetary value for the freshmen class / tuition and fees. (4)

Feshmen grant recipient discount rate. The percentage discount rate calculated as follows:

Freshmen grant recipient discount rate = average monetary value per freshman grant recipient / tuition and fees. (5)

Definitions of Terms – Institutional Goal Variables

<u>Acceptance rate</u>. The percentage calculated by dividing the number of freshmen who were admitted by the total number of freshmen who applied for admission.

<u>Admission index.</u> An index calculated by dividing the *admission yield* by the *acceptance rate*.

<u>Admission yield.</u> The percentage calculated by dividing the number of freshmen enrolled by the total number of freshmen who were admitted for the fall term of enrollment.

<u>Average 75th percentile ACT score.</u> The average 75th percentile composite ACT score for applicants who were admitted to become freshmen, reported by each institution in this study. When completing their IPEDS survey, schools reported the number of students submitting test scores on both the SAT and ACT tests, as well as the 75th percentile score for each test. The test which was taken most often was used for assessment of the percentile scores. If the

SAT test was used most often, then the SAT score was converted to the equivalent ACT score for comparison purposes. See the translation values used in Appendix B.

<u>Completion rate</u>. The 6-year graduation rate calculated by dividing the number of freshmen in a particular year (cohort) by the number completing their program within 150 percent of the normal time to completion.

<u>Freshmen enrollment increases.</u> The percentage increase (or negative increase) of freshmen enrolled at each institution.

<u>Freshman-to-sophomore retention rate.</u> The percentage of freshmen who returned as either full-time or part-time students for the following academic year. Exclusions from this calculation were the number of students from the original year cohort who left the institution for any of the following reasons: Died or were totally and permanently disabled; serve in the armed forces (including those called to active duty); serve with a foreign aid service of the federal government (e.g., Peace Corps); or serve on official church missions. <u>Institutional wealth.</u> The fiscal year end total asset value divided by the number of freshmen. The total asset value is defined as the sum of cash, cash equivalents, and temporary investments; receivables; inventories, prepaid expenses, and deferred charges; amounts held by trustees for construction and debt service; long-term investments; plant, property, and equipment; and other assets.

<u>Net tuition and fees.</u> The tuition and fees charged to freshmen after deducting average monetary value for the freshmen class as follows:

Net tuition and fees = tuition and fees – average monetary value for the freshman class. (6)

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<u>Racial and ethnic diversity.</u> The percentage of non-White freshmen enrolled. The non-White category consisted of students who either reported an ethnicity of Hispanic (regardless of race) or a race of American Indian or Alaskan Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, or two or more races. Also, any student who reported as a nonresident alien (for whom race and ethnicity are not reported), with multiple races, or have an unknown race and/or ethnicity was assumed to be non-White for purposes of this study.

<u>Recipient net tuition and fees.</u> The average tuition and fees charged to freshmen institutional grant recipients after deducting the average monetary value per freshman grant recipient, calculated as follows:

Recipient net tuition and fees = tuition and fees – average monetary value per freshman grant recipient. (7)

<u>Socioeconomic diversity.</u> The percentage of freshmen enrolled who were eligible to receive the Federal Pell grant, a need-based grant program administered by the federal government and awarded to students from families with low financial resources.

<u>Total full-time undergraduate headcount.</u> The total number of undergraduate students enrolled for 12 or more semester credits, or 12 or more quarter credits, or 24 or more contact hours a week each term.

<u>Tuition and fees.</u> The amount of money charged to freshmen for instructional services for each academic year. Required fees were fixed amounts charged to students for items not covered by tuition and required of such a large proportion of all freshmen that the student who does not pay the charge is an exception.

Limitations

This study contains limitations. The population of this study is limited to the 30 largest 4-year PNP institutions in the Midwest, thus the results of this study can only be generalized to policy decisions at similar institutions in similar markets. The researcher assumes the economic conditions existing in the time-period of the study are representative of economic conditions existing outside this time-period. There were conditions unique to this time-period (housing bubble, economic recession, etc.) that may not be replicated in other time-periods. Also, this study does not attempt to separate need and merit-based aid due to the difficulty in identifying pure need-based aid from pure merit-based aid for the large segments of students who receive both. Further, the institutions of this study may have a ceiling effect on increasing enrollments which will impact the demonstrated effects of tuition discounting on enrollment. Institutions may have had an institutional goal that superseded others and this was not a consideration in this study. The researcher assumed the institutional administrators simultaneously pursued the attainment of each of the institutional goals. Finally, the results of this study rely on the accuracy of self-reported institutional data to IPEDS.

Delimitations

This study included a subset of common institutional goals related to pricing, enrollment, and retention of students but did not include other institutional goals. Also, this study did not control for all confounding variables that have been widely studied to impact enrollment decisions, such as parent education attainment, social capital, and others. This study examined associations between variables and did not intend to determine causation between the allocation of institutional grants and the achievement of institutional goals.

Overview of the Chapters

Chapter II contains an analysis of the historical development of institutional aid as well as a contemporary review of related studies. Chapter III explains the methods used to answer the research questions. Chapter IV describes the results of this study and Chapter V contains conclusions, policy implications, and suggestions for further study.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

This chapter contains a historical background of financial aid in America and an analysis of literature relevant to the research questions presented in Chapter I. Literature addressing the history and context of student financial aid spanned a variety of historical documents and sources. Literature related to diversity, enrollment, and financial characteristics includes published works by notable authors Baum, Dynarski, Heller, Hossler, and St. John and were not restricted to studies involving only 4-year PNPs. Research published within the last 10 years was given emphasis.

Historical Background of Financial Aid

Democracy and financial aid.

During America's 238 years of independence, there have been many student financial aid philosophies and policies, created to protect and spread the ideals of democracy and to fuel the massification of higher education. The *Declaration of Independence* held that "all men are created equal, that they are endowed by their Creator with certain unalienable rights, that among these are life, liberty and the pursuit of happiness" (*Declaration of Independence*, 1776). It was this statement that set forth the basic principles for equality of education opportunity that would later guide the initial purposes of federal financial aid. Later, act three of the *Northwest Ordinance* specifically recognized the importance of education, stating

"Religion, morality, and knowledge, being necessary to good government and the happiness of mankind, schools and the means of education shall forever be encouraged" (*The Northwest Ordinance*, 1787). So, with the first two major government documents in place, our founding fathers established the ideal that equality of education opportunity and education for good government and happiness were fundamental to a successful democracy.

Shortly after the U.S. Constitution was signed, the *Bill of Rights* was passed to protect basic rights that were omitted from the *Constitution*. The final version of the *Bill of Rights* included the freedom to establish and exercise religion and freedom of speech, two basic rights that allowed for the continuance and further establishment of religiously based private institutions as well as the basic philosophy of academic freedom. Because the bill provided no provisions for federal power over education, the power to establish education was vested in the states.

Thomas Jefferson understood that education was a cornerstone to a successful democracy. Jefferson believed that "democracy cannot long exist without enlightenment, that it cannot function without wise and honest officials, that talent and virtue, needed in a free society, should be educated regardless of wealth, birth or other accidental condition, and that the children of the poor must be thus educated at common expense" (Padover, 1952, p. 43).

Although this statement was broadly directed toward the right to primary education, it also supports the basic philosophy of taxpayer funded student financial aid programs for postsecondary education. Within the first 100 years of our democracy, the founding documents were in place and the fundamental philosophy supporting federal aid to education was established.

The establishment of federal and state aid directed toward institutions.

The *Morrill Act* in1862 serves as the first major federal financial aid program for colleges and universities. Through federal land grants, it provided direct aid to institutions to support the establishment of public institutions in every state, which broadened educational opportunities for Americans. The *Morrill Act* also mandated the establishment of military training programs at every land grant college, now known as the Reserve Officers' Training Corps (ROTC). The use of financial aid to incentivize ROTC cadets to become Army or Air Force officers foreshadowed similar uses of financial aid to come.

The *Second Morrill Act of 1890* was enacted to apply a portion of the proceeds of the public lands given since 1862 to more fully support the benefit of agriculture and mechanical arts (Second Morrill Act, 1890). This is an important Act because it extended access to higher education by providing additional endowments for all land-grants, but prohibiting distribution of funds to states that maintained distinctions of race in admission decisions (2009). Interestingly, the *Morrill Acts* show that although the federal government initially intended to give the authority for education to states, it has tended to use its broad funding appeal to incentivize particular behaviors at the state and institutional levels. This is also an example of a mixing of purposes among the providers of financial aid.

The establishment of aid directed toward students.

The first major federal program to assist individual students was conducted by the National Youth Administration, beginning in 1935. This program was created out of necessity to encourage higher education participation in spite of the depressed state of the nation following the Great Depression. As such, it was not necessarily designed as a program to create a philosophy of directly sending federal aid to students, but rather a program for meeting a specific national need. This program is important because through the assistance of individual students, the federal government began their indirect support of both private and public institutions (Wilkinson, 2005).

Two important trends emerged from the National Youth Administration program. First, it established federal support for educational institutions by indirect means; support for students who would vote for the best institutions with their feet. Second, it continued a trend that began with the *Morrill Act* wherein the federal government used federal funds to directly incentivize behaviors. With the advent of the next social crises, World War II, the federal government felt the need to make another stance in favor of higher education (Wilkinson, 2005).

On June 22, 1944 the *Servicemen's Readjustment Act*, otherwise known as the *G.I. Bill of Rights* was signed into law by Franklin D. Roosevelt to "provide Federal Government aid for the readjustment in civilian life of returning World War II veterans" (Servicemen's Readjustment Act, 1944, An Act, para. 1). In a statement, Roosevelt said, "It gives servicemen and women the opportunity for resuming their education or technical training after discharge...not only without tuition charge up to \$500 per school year, but with the right to receive a monthly living allowance while pursuing their studies" (U.S. Department of Veterans Affairs, n.d., "President Franklin D. Roosevelt's Statement," para. 2). This bill supports the idea that large numbers of people could benefit from college education and it served as the first of many programs to broaden access to postsecondary education in America. It had an immediate impact. Between 1944 and 1956 nearly half of the 16 million World War II veterans had participated in education or training (U.S. Department of Veterans Affairs, n.d.). The *GI Bill* was later extended to provide benefits for veterans of the Korean War and more recently revised to provide an array of expanded benefits to veterans serving post September 11, 2001.

The peacetime prosperity that followed World War II led to more college graduates and a boom period for higher education in America. The "ultimate effect [of federal involvement] was to foster accelerated programs, cooperative research, the growing importance of technical and scientific studies, and the inundation of the colleges by such great numbers of students as had never been seen before" (Brubacher & Rudy, 2008, p. 225). Again, the advent of both the National Youth Association program and the *GI Bill* extended the trend which began with the establishment of the ROTC programs; wherein the federal government created incentives to react to areas of national concern.

In the 1950s, as gifts and tuition revenues grew, it became necessary for mostly private institutions to begin developing their own formulas for the distribution of institutional funded student aid funds. This development was also a logical response to the threat imposed by the support for federal aid to public institutions. In 1954 the College Scholarship Service was founded by a consortium of private colleges and universities. This consortium created a system to determine financial need of student applicants and by 1956, a national need analysis system was in place that allowed all institutions to determine the financial need of students. This was the beginning of the still existent philosophy that student financial aid should be awarded on the basis of financial need (Anonymous, 2008, McCants, 2003).

The 1957 launching of Sputnik fueled fears that America had lost its scientific superiority and spurred public demand for greater involvement of the federal government in aiding students. A *New York Times* article suggested "the Soviet Union is far outstripping the United States in its emphasis on technical and scientific education" (Fine, 1957, p. 1).

"Federal aid to higher education now had the highest priority" (Brubacher & Rudy, 2008, p. 235). The widespread public outcry led to the passing of the *National Defense Education Act (NDEA)* in 1958.

The provisions of the *NDEA* promoted greater access to postsecondary education with a long standing impact on our country as well as the philosophies of federal student aid programs. For instance, Title II of the Act "spurred creation of federal and university funded college loan programs that still exist today" (Flattau et al., 2006, p. II-1). Moreover, according to Ihrke (2006), "The National Defense Student Loan Program (NDSL) established by Title II is credited with creating a broad acceptance of student loans as a method of financing postsecondary schooling by improving the accessibility of higher education for needy students, increasing the popularity of financial aid "packages" among colleges and universities, and providing a precedent for subsequent federal student loan and aid programs" (as cited in Flattau, et al., 2006, p. II-5). This loan program still exists today and is known as the Federal Perkins Loan program.

The period 1958 to 1964 was a tumultuous period for our country, highlighted by the assassination of John F. Kennedy and the passage of the *Civil Right Act*. Also, in 1964, the *Economic Opportunity Act* was passed to combat poverty. In this act it was written that The United States can achieve its full economic and social potential as a nation only if every individual has the opportunity to contribute to the full extent of his capabilities and to participate in the workings of our society. It is, therefore, the policy of the United States to eliminate the paradox of poverty in the midst of plenty in this Nation by opening to everyone the opportunity for education and training, the opportunity to work, and the opportunity to

live in decency and dignity. (The Economic Opportunity Act of 1964, "Findings and Declaration of Purpose," para. 1)

The philosophy of equal opportunity had won the day. This Act set forth provisions to support job corps programs and work study programs. Federal work study is still a substantial part of our country's student financial aid programs. More importantly, the passage of this Act established momentum for the founding of additional student financial aid programs designed to help solve the poverty challenges in our country.

1965 to 1972: Establishment of need-based aid programs.

On November 8, 1965, Lyndon Johnson passed the *Higher Education Act (HEA)*, which, as amended is the current law authorizing all federal financial aid programs. This legislation set forth federal grants for needy students and established government guarantees of student loans, both of which exist in similar forms today. It also consolidated the *NDEA* and the federal work study programs that had received prior authorization. Since the passage of this Act, we have seen rapid expansion in student aid programs (Wilkinson, 2005). In the mid-1960s and early 1970s, colleges saw an influx of students due to the coming of age of the baby boomer generation. The campus based programs that were established with the *NDEA* and *HEA* nearly a decade earlier provided very limited funds, therefore, they were not meeting the demands from needy students. As a result, many needy students were unable to attend college, which caused further congressional action (Wilkinson, 2005).

The *Higher Education Act* of June 23, 1972 was passed as the most important federal measure in the field of higher education in more than a century (Brubacher & Rudy, 2008, p. 237). For the first time in history, Congress authorized direct federal funds to nearly all institutions of higher education "with no strings attached" and it also authorized, as a matter
of national policy, for any financially needy college student to receive grants for education (Brubacher & Rudy, 2008, p. 236). By creating the Basic Educational Opportunity Grants, Congress provided for a minimum level of resources to help assure access to higher education. These grants, later named Pell Grants, were administered in Washington, were based on one need analysis formula, and were portable by the student, regardless of their college choice. The campus based programs established during the 1960's continued to serve as supplemental aid to help ensure a basic level of choice among institutions. Thus, this reauthorization established the basic charter and philosophy for the federal student aid system; one which attempts to allow students a choice among institutions who meet their needs, irrespective of their ability to pay.

1972 to 1992: Focus on aid directed to middle income families.

In 1978, Congress passed the *Middle Income Student Assistance Act* to expand federal need-based aid programs to middle income families. This Act also opened subsidized guaranteed loans to any student regardless of income and financial need. The attention toward middle income families continued with the passing of the 1980 reauthorization which further expanded need-based programs and extended guaranteed loans to parents and graduate students.

Between 1980 and 1992, spending on student aid leveled off. At the same time, tuition prices increased, so students were becoming increasingly reliant on student loans to meet rising costs. Federal student loan volume tripled during this time-period (Snyder & Dillow, 2013, Table 419). As the government's guaranteed student loan portfolio grew, it became uncertain that the cost of the program could be managed. Congress addressed these concerns by eliminating or reducing appropriations for grants or other federal aid, which reduced the availability of grant aid for students (Archibald, 2002).

The 1992 reauthorization was intended to begin to balance the use of loans and grants among students. The effects of the reauthorization were mixed. It effectively increased eligibility for grant aid, but it simultaneously caused an increased reliance on student loans. Grant eligibility was increased through the establishment of a consolidated methodology for determining a student's financial need. The data collected from students' families through the Free Application for Federal Student Aid (FAFSA) informed a new federal need analysis methodology that replaced the methodology created by the College Scholarship Service 4 decades earlier. The result of this new methodology was a dramatic increase in calculated financial need which extended grant aid eligibility to a wider range of middle income families. The reauthorization also increased student loan limits, removed the borrowing cap from the federal parent loan (PLUS) program, and introduced a new unsubsidized loan program that allowed students to borrow guaranteed loan funds regardless of financial need. These actions resulted in dramatic increases in education loan borrowing; nearly a 60% increase over the 2 years spanning 1993 to 1995 (Gladieux, 1995).

1992 and beyond: Affordability challenges and increasing debt burdens.

In constant 2008-09 dollars, tuition and fees at 4-year PNP institutions rose 155% between the years 1992 and 2009 (Snyder & Dillow, 2011, Table 345). During this same time span the average federal grant per full-time undergraduate student rose 90% and the average non-federal grant per full-time undergraduate student rose 144% (Snyder & Dillow, 2013, Table 392; Snyder & Dillow, 2013, Table 393). Altogether, grant aid increased 135%. Percentages began to demonstrate why an education from a 4-year PNP was becoming less

affordable, but the story became even clearer when actual dollars were considered. The average dollar value increase in tuition and fees was nearly \$20,000 whereas the average dollar value increase for federal and non-federal grants per full-time undergraduate student was \$580 and \$4,471, respectively (Snyder & Dillow, 2013, Table 392; Snyder & Dillow, 2013, Table 393). In essence, undergraduate students at 4-year PNPs were expected to pay about \$14,000 more for 1 year of tuition and fees in 2009 than they would have paid in 1992.

The combination of large increases in tuition and fees with small increases in federal and non-federal grant aid and stagnating incomes has caused an affordability challenge for many students, forcing them to increasingly borrow loans to pay for college. As of the second quarter of 2014, the aggregate outstanding student loan balance now stands is more than \$1.1 trillion, surpassing the total edit card balance and the total auto loan balance (Federal Reserve Bank of New York, 2014). About 40% of these borrowers are under the age of 30 versus just 27% for borrowers aged 30 to 39, which is an indication of the recent trend of more borrowing among traditional aged college students (Brown, Haughwout, Lee, Mabutas, & van der Klaauw, 2012). There are now at least as many adult Americans with student-loan debts outstanding as there are living bachelor's degree recipients (Vedder, 2012). About 25% of borrowers owe more than \$28,000 and 10% owe more than \$50,000 (Brown, et al., 2012). Student loans are the leading category of debt for delinquent balances beyond 90 days (Federal Reserve Bank of New York, 2014, p. 9).

Borrowing has differed by sector. Generally, on average, students graduating from 4year PNPs have borrowed more, but have paid their loans back at a higher rate. In 1992-93, education loans accounted for 33% of all aid to undergraduate students and by 2012-13 this percentage was 39%, off its peak of 50% in 2007-08 (Baum & Payea, 2013, Table 2A). The rise was even more dramatic when 4-year PNPs were considered separately; in this sector education loans accounted for approximately 48% of all aid in 1992-93 and approximately 58% of all aid in 2007-08 (Snyder & Dillow, 2013, Table 393). About 65% of the 2010 bachelor's degree recipients at 4-year PNPs graduated with debt and the average debt per borrower was \$29,900, up from \$24,200 (in 2012 dollars), a decade earlier (Baum & Payea, 2013, Figure 10b). Additionally, in 2013, about 8% of 4-year PNP borrowers who entered repayment three years prior were in default versus 9% at public 4-year institutions and 22% at for profit institutions (Snyder & Dillow, 2013).

Tuition Discounting

Background.

To combat the aforementioned affordability challenges and rising concerns about student debt levels, colleges and universities have recently embarked on more aggressive tuition discounting practices (Davis, 2003). Some 4-year PNPs, primarily the more selective institutions, have established tuition discounting policies to incentivize enrollment from more high ability students and to increase net revenues (McPherson & Schapiro, 1998; Griffith, 2011). Other, less selective, 4-year PNPs have increased institutional grants primarily to thwart rising affordability concerns and to maintain some level of enrollment. It is clear, among many 4-year PNPs, tuition discounting has become a prominent practice and its mixed purposes have complicated pricing and affordability.

Between 2000-01 and 2012-13, after adjusting for inflation, the average institutional tuition discount at 4-year PNPs increased from about \$6,870 to about \$11,800 (Baum, & Payea, 2013, Figure 20b). Institutions have become the largest and most common source of tuition discounts for students attending 4-year PNPs. In 2007-08, 77% of students received

an institutional tuition discount versus just 54% in 1992-93 (Snyder & Dillow, 2013, Table 392). Increasingly, the ability to pay and willingness to pay for students considering 4-year PNPs has been contingent upon the receipt of an institutional tuition discount.

The advent of merit-based aid.

Over the last 2 decades there has been a shifting of policies away from primarily need-based to primarily merit-based. This shifting has occurred at the federal, state, and institutional levels. In 2006, the federal government enacted two new grant programs as part of the President's American Competitiveness initiative. The grants were awarded to incentivize students to study certain technical fields or foreign languages deemed vital to national security. To be eligible for these grants, students were required to have financial need and to meet certain academic standards. In 2007-08, about \$500 million was awarded to nearly 500,000 students as part of these programs (U.S. Department of Education, n.d.).

In 2012-13, 26% of state funded aid was based on merit compared to 90% in 1991-92 (Baum & Payea, 2013, Figure 17a). States have used merit aid to incentivize college going behaviors to meet a range of policy goals. These goals have included increasing access to college for certain student groups (Cornwell, Mustard & Sridhar 2006; Dynarski, 2000; Heller & Marin, 2002), promoting and rewarding academic excellence (Cornwell, Mustard & Sridhar, 2006; Heller & Marin, 2002), responding to accountability issues with tangible outcome measures (Dynarski, 2003), satisfying middle-income voters (Dynarski, 2000), and competing with other states' merit-based programs (McLendon, Heller & Young, 2002). Most commonly, states have used merit-based aid to keep the best and brightest students at home to address issues related to state economic competitiveness and development (Cornwell, Mustard, & Sridhar, 2006; Doyle 2006; Heller & Rogers, 2003). A well-educated labor supply is critical to states' economic development (Breneman & Finney, 1997; Heller, 2003).

In 2009-10, among all 4-year PNPs, 75% of students received an institutional grant, yet only 61% of students applied for need-based financial aid and only 40% of students received the Federal Pell grant, which is awarded to the students who demonstrate the most financial need (NCES, 2011). These figures provide evidence that a large portion of institutional tuition discounts have been provided to students who did not have demonstrated financial need. Further, *U.S. News & World Report* indicated that in 2010-11 there were many colleges and universities where more than 40% of students who received an institutional grant had no demonstrated financial need ("Most Students Receiving Merit Aid," 2014).

The practice of tuition discounting has grown in recent years and, as greater resources are dedicated, more research is needed to assess its impact on students and its association with the attainment of certain institutional goals (Lasilla, 2010). The following sections provide a review of recent trends in pricing as well as an in depth review of recent literature considering the impacts of tuition discounting practices at the institutional level. Because of the recent shift in attention toward merit-based aid most of the recent literature on tuition discounting practices has emphasized the positive and negative impacts of merit-based aid and placed less attention on need-based aid.

Factors affecting tuition discounting policy choices.

There have been wide differences in the published prices of tuition and fees among different types of institutions. Differences exist across sectors and geographic locations and are also based on the size of institutions. In 2009, the average annual price of tuition and fees

was \$6,721 for institutions in the 4-year public sector and \$25,715 for institutions in the 4year PNP sector (NCES, 2011). The geographic location of institutions has also been a differentiating factor of pricing. For instance, in 2009, the average tuition and fees at 4-year PNPs in New York was \$30,207 (NCES, 2011). By comparison, the average tuition and fees at 4-year PNPs in Michigan was \$16,206 (NCES, 2011). The differences have been between states as well as entire regions. For example, in 2013-14, the average tuition and fees at 4year PNPs in New England states were 32% higher than the average tuition and fees at 4year PNPs in Midwestern states (Baum & Ma, 2013, Table 4). Finally, prices have varied widely by headcount enrollment. In 2009, 4-year PNPs enrolling more than 1,000 freshmen had average tuition and fees of \$29,038 (NCES, 2011). Smaller 4-year PNPs had average tuition and fees of \$24,014 (NCES, 2011). These sector, geographic, and headcount enrollment differences have made it difficult for federal policy makers to draft effective one-size-fits-all policies and have forced public policy makers and institutional administrators to understand complex differences in competitive markets when considering pricing policy alternatives.

Tuition discounts have been provided to help lower the net price for students with lower financial means as well as to increase the probability that particular students will choose to enroll (Baum & Lapovsky, 2006). To increase the academic profile of their student body while also maintaining a mix of socioeconomic, racial and ethnic diversity, many administrators have chosen to award both merit and need-based aid. To fund need-based grants many institutions have adopted the concept of 'high-tuition, high-aid' policies (Nishimura, Watkins, & Burbank, 2009). In theory, these institutions set a high tuition price, collect large amounts of tuition revenues from wealthier students, and then redistribute those revenues in the form of need-based grants for lower income students. In theory, merit aid is used to incentivize enrollment which provides additional tuition revenues that can then be converted to more need-based grants for low income students (Bowen, Kurzeweill, & Tobin, 2005). Although not widely studied at private 4-year PNPs, high-tuition, high-aid strategies have been shown to reduce access, decrease the academic profile, and increase student debt at a few flagship public institutions (Nishimura, 2009).

Changing demographics are especially challenging for administrators at 4-year PNPs in the Midwest. In 2010, over 87% of full-time students attending 4-year PNPs were between the ages of 18-24 (Aud, et al., 2011). Prescott & Bransberger (2012) predicted a 2.4% growth nationally in the number of high school graduates between 2010 and 2020. This prediction is much less positive for the Northeast and Midwest regions, where they predicted a 9.4% and 3.6% decline, respectively (Prescott & Bransberger, 2012). Meanwhile, the West and South are predicted to grow at rates of 5.5% and 10.9%, respectively (Prescott & Bransberger, 2012). When these predictions are considered together with the fact that in 2009 only 19% of full-time college students aged 18-25 attended a 4-year PNPs, it is clear that demographic shifts from the Midwest and Northeast to the South and West require state policy makers and institutional administrators to carefully consider the changing competitive landscape of their markets as well as the impact of pricing and financial aid strategies on the college going behavior of students they serve (NCES, 2011).

Federal and state policymakers face increasingly complex financial challenges which place downward pressure on the allocation of tax dollars for student aid programs. These pressures trickle down to institutional administrators, forcing them to consider ways to increase or strategically re-allocate aid to offset decreases from the federal and state levels. At the same time, institutional administrators are facing increasing demands for financial stability, higher rankings, and improved competitive standings despite increasingly challenging shifts in market demographics and socioeconomic patterns among consumers of higher education. As a result, administrators are forced to create policies in an attempt to meet conflicting and overlapping goals and are often not aware of the effects of these policies, especially over the long term. When compared to institutional type, geographic location, institutional size, reputation, and program offerings, tuition pricing and tuition discounting decisions are easier for administrators to manipulate and control. Therefore, pricing decisions and the setting of net price through the use of tuition discounts are often the primary strategic levers available to administrators at 4-year PNPs.

Tuition discounting and enrollment.

Enrollment decisions are impacted by a number of factors, including price, geographic location, socioeconomic conditions, reputation, or program offerings (Akerhielm, Berger, Hooker, & Wise, 1998; Beattie, 2002; Hsing and Chang, 1996; Heller, 1999; Kane, 2003; Manski & Wise, 1983; Perna, 2000; Shin and Milton, 2006; and Titus, 2006). Public choice theory predicts market conditions will drive individuals' choices when competitive alternatives are presented (Ostrom & Ostrom, 1971). Therefore, all else being equal, it is assumed that applicants to colleges and universities will choose to attend the college or university offering the lowest price (Winston & Zimmerman, 2000).

Empirically, lower net prices of tuition have been found to positively affect individual enrollment decisions and produce additional revenues for institutions. Avery, Glickman, Hoxby and Metrick (2004) found that high ability students responded to price changes in a rational manner. Heller (1997) found that the likelihood of enrollment decreases as the price of college increases and this was found to be true across various methodological approaches investigating enrollment of poor students, wealthy students, White students, or underrepresented students. Others have found that for every \$1,000 offered in a tuition discount, the probability of the given student enrolling increased between 1.1% and 6.8% (Braunstein, McGrath, & Pescatrice, 1998; Curs, 2008; Leslie & Brinkman, 1987; Paulsen & St. John, 2002). Finally, tuition discounting has shown to produce additional tuition revenues which can lead to enrolling more low income students (Bowen, Kurzweill, & Tobin, 2005).

Different types of students respond differently to tuition discounts therefore tuition discounting has not always produced the desired effects on enrollment and has decreased revenues at some colleges (Avery & Hoxby, 2003; Davis, 2003; Desjardins, 2001; Ehrenberg & Sherman, 1984; Monks, 2009, Redd, 2000; Singell & Stone, 2002). When comparing the effects of grants and tuition increases, St. John (1990) found that students are more responsive to changes to grants than they are to changes to tuition. He also found the effects of grants decline with increases in income (St. John, 1990). Therefore, since measurements of high ability have been found to be correlated with higher income, institutional administrators who offer large tuition discounts to attract high ability students may not achieve their expected results (Griffith, 2011). Furthermore, shifting institutional funds away from need-based discounts toward merit-based discounts may lead to decreases in enrollment of low-income or underrepresented students (Griffith, 2011). Failing to meet enrollment projections because of misinformed allocation of institutional grants has caused decreased net revenues at some colleges (Davis, 2003; Redd, 2000).

Tuition discounting, student persistence and completion rates.

The effect of tuition discounts on persistence is to lower the financial burden of tuition costs and to reduce the need for students to spend time away from academics for working (Goldrick-Rab, Harris, & Trostel, 2009). Generally, the receipt of a financial aid award is positively related to higher rates of persistence (Alon, 2011; Wei & Horn, 2002; DesJardins, Ahlburg, & McCall, 2004; Dowd, 2004; Gross, Hossler, & Ziskin, 2007; Heller, 2003; Horn, Peter & Carroll, 2003; Kerkvliet & Nowell, 2004; Light & Strayer, 2000; Paulsen & St. John, 2002; St. John, Hu, & Weber, 2001). Higher persistence rates ultimately lead to higher completion rates (Brunt, 2011).

When making decisions to continue in school, students have reacted to discounts differently. Alon (2011) found tuition discounts prevented students from the bottom two income quartiles from dropping out of college. The persistence rates of students from the second lowest income quartile, who are on the margin of being eligible for federal and or state need-based aid, were the most sensitive to increased discounts (Alon, 2011). For the average student in the lowest income quartile, a \$1,000 increase in tuition discount resulted in a 6% greater likelihood of persisting from the 1st to 2nd year, whereas a \$1,000 increase to the average student in the second lowest quartile resulted in a 10% greater likelihood of persisting from the 1st to 2nd year to students in the top 2 quartiles did not impact persistence rates (Alon, 2011). This is evidence that administrators should consider both the variety of effects of tuition discounts and allocate funds appropriately. This study used a national sample of students and did not provide separate data for students from 4-year PNPs, nor did it provide differences based on race or ethnicity.

There is further evidence that tuition discounting generally has a positive impact on persistence. Ackerman, Young, and Young (2005) found that the Nevada Millennium Scholarship program promotes persistence among award recipients. Gross, Hossler, and Ziskin (2007) found that colleges and universities may be able to improve student persistence rates by awarding financial aid to a greater number of enrolled students. They also caution that while institutional grants are positively correlated with persistence, its impact on the overall explanatory reasons for persistence was small; institutional grants are just one factor among many that contribute to persistence decisions (Gross, Hossler, & Ziskin, 2007). These findings are also tempered by the fact that proportional increases in merit aid may have skewed the results because these policies have favored higher ability students who were more likely to persist in the first place (Gross, Hossler, & Ziskin, 2007).

Tuition discounts affect student choice which has been found to have a negative impact on persistence and revenues. Merit-based discounts contingent upon maintaining a certain minimum GPA have had detrimental effects on students' choice of major because students have migrated towards less rigorous majors (Hu, 2008). Dee and Jackson (1999) found that roughly half the recipients of the HOPE scholarship at one flagship institution in Georgia lost their support after their 1st year in college, especially in the critical fields of science, engineering, and computing. Also, Orsuwan and Heck (2009) found the receipt of state funded merit aid has incentivized students to attend college close to home, which may not always fully align with their academic abilities and interests. Finally, institutions that pay for merit aid by shifting funds away from student services or academic programs may impede their own efforts to improve student retention and degree completion, which could have a detrimental effect on revenues (Davis, 2003).

There have also been wide disparities of completion rates among racial and ethnic groups. Asians have led the way in bachelor's degree completion by age 29, completing at a rate of 71% (Mortensen, 2011). Whites have completed at a rate of 55.7% and Blacks and Hispanics have completed at rates of 35.3% and 36.6%, respectively (Mortensen, 2011).

These gaps are striking, but the completion rates for Blacks have improved slightly faster over the past 2 decades. Between 1992 and 2007, Bachelor's degree completion rates by age 25 to 29 increased 18.3% for Asians, 7.1% for Blacks, 4.5% for Whites, and 1% for Hispanics (Mortensen, 2011). There is evidence tuition discounting policies may have incentivized Blacks and Hispanics to choose lower priced and less selective institutions or to choose to attend 2-year colleges, which tend to have much lower bachelor's degree completion rates than the alternative choice of 4-year institutions (Singell, Waddell, & Curs, 2004; Mortensen, 2009).

Persistence gaps exist between the highest and lowest income earners even after netting out noneconomic aspects of family capital, such as human, social, and cultural resources, which reinforces the importance of family financial resources for persistence and degree attainment of economically disadvantaged students (Advisory Committee on Student Financial Assistance (ACSFA), 2010; Haveman & Smeeding, 2006). Tuition discounting policies addressing economic inequality are imperative for equalizing persistence rates (ACSFA, 2010, Bailey & Dynarksi, 2011). In addition, efforts to equalize the likelihood of achieving a bachelor's degree must consider existing gaps across racial, ethnic, and gender categories (Bailey & Dynarski, 2011).

Tuition discounting and standardized test scores.

Some have argued that the quality of the student body, as partly measured by average standardized test scores, is used as an important measure of the overall quality of the institution (Winston, 1999). Therefore, increasing the quality of the student body can lead to an increase in institutional prestige and tends to draw more high ability students in the following years (Griffith & Rask, 2007; Monks & Ehrenberg, 1999; Winston, 1999).

Institutions use merit aid as a tool to compete with peer institutions for high-ability students and often use standardized test scores to determine merit-based awards (Baum & Lapovsky, 2006; Griffith, 2011). Griffith (2011) found that colleges adopt a merit aid policy in response to low growth in standardized test scores of their incoming class and decreases in their *US News & World Report* rankings.

Standardized test scores are highly correlated with income and race (Griffith, 2011). This has prompted the concern that merit-based policies discriminate against underrepresented and lower income students (Davis, 2003; Dynarski, 2000; Griffith, 2011). These concerns are validated by three notable studies. McPherson and Schapiro (1998) found that non-White students are under-represented in the merit-aid pool. Kash and Lasley (2011) found that merit-based aid is received less and retained less by lower income students who may not qualify for these awards in the first place or may not have necessary non-financial support for retaining them. Heller (2006) found that high percentages of tuition discounts are going to families with incomes above the median. To offset these concerns, some institutions have adopted 'test-optional' policies that favor the concept of using non standardized, non-cognitive measurements of achievement (Hoover, 2010). Even so, the majority of institutions have continued to use standardized test scores as measurements of achievement for determining merit-based awards (Hoover, 2010).

Tuition discounting and measures of institutional selectivity and demand.

Two of the strongest factors influencing college choice are institutional selectivity and demand (Eagan, Lozana, Hurtado, & Case, 2013; Hossler, Schmitt, & Vesper, 1998). Institutional selectivity is commonly measured by an institution's *acceptance rate*, which is the number of applicants admitted to an institution divided by the number of applications received by an institution. An institution's *acceptance rate* provides an indication of the likelihood of being admitted to the institution. One measure of demand is an institution's *admission yield*, which is the number of students who choose to enroll divided by the number of admitted applicants. The *admission yield* provides an indication of the desirability of the institution to prospective students. A lower *acceptance rate* equates to a lower likelihood of being admitted to the institution, which results in a perception of a more selective institution. A higher *admission yield* rate is an indication of the demand for an available seat at the institution.

An institution's acceptance rate is a factor in the annual U.S. News & World Report rankings of colleges and institutional administrators have adopted many strategies to influence this measure. For example, to increase the number of applicants, administrators may provide pre-filled applications to prospective students. Also, administrators have adopted a variety of admission policies to influence the number of acceptances: early-action, early-decision, wait list, and deferred admission. These policies directly impact the acceptance rate and can have a positive impact on an institution's rankings, but they may negatively impact an institution's *admission yield*. Therefore, it is informative to examine both the *acceptance rate* and *admission yield*. The *admission index* is a simultaneous measure of the *admission yield* and *acceptance rate* that indicates an institution's overall appeal. A higher admission index indicates a lower acceptance rate, a higher admission yield, or a combination of both. For example, in 2010, Harvard University's admission index was 10.4, which is comprised of an *admission yield* of 75% and an *acceptance rate* of 7.2%, whereas the University of Tulsa's admission index was 0.76, which was comprised of an admission yield of 29.9% and an acceptance rate of 39.1%. In addition to average

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standardized test scores, measures of selectivity and demand are often perceived as measures of overall institutional quality. In the 2012 *U.S. News and World Report* ranking, Harvard University was ranked 1st and Tulsa University was ranked 75th among all national universities.

Institutional selectivity is related to *freshmen-to-sophomore retention rates* and *completion rates*. Mortensen (2011) classifies highly selective institutions as institutions that primarily accept students who graduate in the top 10% of their high school classes and have the highest test scores and liberal arts institutions as institutions that primarily accept students from the bottom 50% of their high school classes with lower test scores (Mortensen, 2011). In 2011, highly selective 4-year PNPs had 6-year completion rates exceeding 86%, whereas 4-year private liberal arts institutions had 6-year completion rates of about 45% (Mortensen, 2011). The College Board classifies selective institutions across 5 categories based on percentages of students accepted and has a separate category for non-selective or open admission institutions. The lowest quintile of selective institutions accepted 90% or more of applicants whereas highly selective institutions accepted fewer than 25% of their applicants (Baum & Ma, 2013, Figure 26b). According to this rubric, highly selective institutions graduated 88% of their students versus a 45% rate from the lowest selective quartile of institutions (Baum & Ma, 2013, Figure 26c). Also, at highly selective 4-year PNPs, the average freshmen-to-sophomore retention rates were over 93%, much higher than the average 61% rate at 4- year, private liberal arts institutions (Mortensen, 2011). These statistics provide some evidence that institutional selectivity is linked to outcomes and explains why parents have perceived highly selective institutions as places where their children have a higher likelihood to persist through degree completion.

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Institutional selectivity is a measure used in national rankings of colleges and universities (Morse & Flanigan, 2013) and it also drives differences in *tuition and fees*, grant packages, and ultimately, net prices. Nationally, the 4-year PNPs with lower *acceptance rates* and higher rankings had higher *tuition and fees*, awarded larger grant packages, and had higher net prices (NCES, 2011; *U.S. News & World Report*, 2014). Lower *acceptance rates* and higher rankings are indications the institution has been able to generate more net tuition and fee revenues.

Tuition discounting and racial and ethnic diversity.

Black and Hispanic students have lagged White students in college entrance and the difference has grown over time (Mortensen, 2010). The entrance rate difference between Whites and all non-Whites averaged 12.4% for the years 1960 through 1964 (2010). This gap decreased to 4.3% for the years 2007 through 2010 (Mortensen, 2010). The declining difference for all non-Whites is primarily due to high college entrance rates for races other than Black or Hispanic, especially Asians. The results are much different when comparing entrance rates of Whites to only the group of Blacks or Hispanics. The entrance rate gap between Whites and Blacks was 3.7% for the years 1976 through 1980 and the gap rose to 9.7% for the years 2006 through 2010 (Mortensen, 2010). The entrance rate gap between Whites and Hispanics averaged 0.2% for the years 1976 through 1980 and averaged 7.8% for the years 2006 through 2010 (Mortensen, 2010). While colleges and universities have seen overall enrollments from the non-White group improve over time, the rates of entrance for Blacks and Hispanics have not kept pace.

There is recent evidence of the impacts of tuition pricing and discounting practices on college entry rates for various racial and ethnic groups. The more recent movement from a

long tradition of need-based aid to merit-based-aid has been linked to increased inequality in college participation (Kim & Sambonsugi, 2010). Traditionally, need-based aid programs have been well targeted toward Black and Hispanic students because of the strong relationship between race and income (Kim & Sambonsugi, 2010). Griffith (2011) and Heller (2002) found that the use of merit aid appears to have detrimental impact on the racial composition of the student body. Many studies have found relationships between race and achievement (Heller & Marin, 2002; Cornwell, Mustard, & Sridhar, 2006). Also, Lasilla (2010) found that the 75th percentile ACT score was negatively correlated with enrollment of Blacks and positively correlated with the enrollments of Whites and Asians at 4-year PNPs. Essentially, institutions that use test scores to determine merit awards may do so at a detriment to enrollment of Blacks and Hispanics (Inue & Geske, 2006).

Multiple studies have shown negative or null effects of tuition discounts on enrollments of under-represented students. Kim and Sambonsugi (2010) found a negative relationship between enrollments of under-represented students and the existence of merit aid programs. Redd (2000) found that private institutions with high growth in tuition discounting suffered enrollment decreases of 5% from 1990-91 to 1997-98 while institutions with lower growth in tuition discounts saw enrollment growth of 11%. Further, Lasilla (2010) found no statistically significant relationship between institutional discounts and enrollment of Blacks and Hispanics over the long-term. McPherson and Schapiro (1998) found that non-White students are under-represented in the merit-aid pool, and White students over-represented. Persistent differences in enrollment between Whites and non-Whites are a threat to the future of our democracy (Heller, 2002). While the above findings may suggest that tuition discounting is ineffective in increasing enrollment of particular race or ethnic classes over the long term, there is evidence that tuition discounting may improve diversity in the short term. Lasilla (2010) found a positive relationship between tuition discounts and enrollments of Blacks and Hispanics. Singell, Waddell, and Curs (2004) found that merit-based grants increased access for low income students enrolling in 2-year community colleges and less selective 4-year colleges. The evidence is clear to suggest that administrators who face pressure to increase diversity may be tempted to use tuition discounts to improve enrollments of under-represented students in the short term and should consider the potential long term impacts of their decisions.

Tuition discounting and socioeconomic diversity.

Family income has become a substantially more important determinant of college attendance in recent years (Belley & Lochner, 2007). "The Great Recession has made an awful situation for low income students very much worse in higher education. While low-income student participation in postsecondary education is at record high levels, their enrollment in 4-year institutions is at record low levels. So too is their full-time enrollment" (Mortensen, 2012). In an analysis of census data, Mortensen (2012) found that 22.9% of dependent students from the lowest income quartile completed their degree by age 24 while 96.8% of dependent students from the highest income quartile complete their degree by age 24. In the past 40 years, the completion rates for students from the highest income quartile have improved by 42% whereas the completion rates from the lowest income quartile have improved only 1% (Mortensen, 2012). Mortensen (2012) also found that the proportion of low-income students enrolled in 4-year institutions has fallen over time and that family

income is a determinant for full-time versus part-time status of students (2012). In a longitudinal study, Bailey and Dynarksi (2011) also found growing college completion gaps between children from high- and low-income families. Rates of college completion increased by only 4 percentage points for low-income cohorts born around 1980 compared to cohorts born in the early 1960s, but by 18 percentage points for corresponding cohorts from high-income families (Bailey & Dynarski, 2011). Among students who began college, income inequality accounted for roughly half of the gap in college completion (Bailey & Dynarski, 2011).

Income stratification among students wishing to attend 4-year PNPs has affected student choice. Students from the lowest income quartile have attended lower priced, lower quality institutions than their counterparts from the highest income quartile. In 2008 students from the lowest income quartile attending 4-year PNPs had average family incomes of \$21,887. In inflation adjusted terms, the average family income of this group did not change from 1990 to 2008 (Mortensen, 2009). In comparison, students from the highest income quartile had average family incomes of \$175,369 and in inflation-adjusted terms, the average family income of this group increased 60% since 1990 (Mortensen, 2009). The increasing gap in incomes is one reason students from the lowest income quartile are choosing to attend lower priced and lower quality institutions compared to their counterparts from the highest income to their counterparts from the highest income to their counterparts from the highest income for a student income and lower quality institutions compared to their counterparts from the highest income to their counterparts from the highest income quartile.

The shifting of institutional grants toward more affluent students has exacerbated income stratification among students attending 4-year PNPs. From 1990 to 2008 total grants to students from the top income quartile increased 504% compared to just an 82% increase in total grants for students from families in the bottom income quartile (Mortensen, 2009).

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Since higher income families are generally not eligible for federal or state need-based aid, total grants to students in this quartile changed primarily due to changes in institutional tuition discounting policies. Income stratification is a symptom of policies that shift aid away from need-based policies toward merit-based policies coupled with stagnating incomes for lower and middle-income families.

As a result of overall stagnating incomes, rising prices, and shifts in aid policies, affordability of higher education has become an increasingly important topic and the above trends suggest lower income families are facing proportionately more difficult affordability challenges. In 1990, 25.2% of all full-time, dependent students enrolled at 4-year PNPs were from the lowest quartile of family income and needed to use 64.8% of their annual family income to cover the cost of 1-year of college (Mortensen, 2009). The requirement that these lower income families use almost two-thirds of their annual income to pay for 1-year of college has eroded the proportion of lower income students attending 4-year PNPs to the point that in 2007 only 15% of all full-time, dependent students enrolled were from the lowest quartile of family income. These families needed to use an average of 82.3% of their annual family income to cover the cost of 1-year of college (Baum & Ma, 2013; Mortensen, 2009). Moreover, there are large differences in *freshmen-to-sophomore retention rates* based on the income quartile of the student (Alon, 2009). Attending and persisting a 4-year PNPs has become rarer and proportionately less affordable for students from the lowest income quartile.

Summary

Throughout our history, several fundamental philosophies and policies have made positive impacts on higher education and the overall education level of our society, yet many of their basic tenets remain unfulfilled. Thomas Jefferson felt that all talented children should be educated at common expense (Padover, 1952). The *NDEA* was passed to improve access to education and established the use of student loans as a means for helping to finance higher education and *The Economic Opportunity Act* established the basic philosophy of equal opportunity for education (Flatteau, et al., 2006; *The Economic Opportunity Act of 1964*). The *Higher Education Act* was passed to allow students a choice among institutions regardless of their ability to pay (Brubacher & Rudy, 2008). The above literature review has provided evidence suggesting that poor and non-White students have experienced unequal opportunity (Davis, 2003; Dynarksi, 2000; Griffith, 2011; Heller, 2006; Kash & Lasley, 2011; McPherson & Schapiro, 1998), student loans have become an increasingly primary means for paying for college and students have become increasingly reliant on institutionally funded grants, especially at 4-year PNPs (Snyder & Dillow, 2013, Table 391). These institutions have increasingly favored higher ability, higher income students, which has helped to stratify educational opportunities and is threatening our democracy (Heller, 2002).

Increasingly, administrators are relied upon to reverse these trends and are prudent to understand the impacts of their policy choices on students and their institutions. Unfortunately, as revealed by this literature review, the effects of tuition discounting strategies at 4-year PNPs in the Midwest have not been documented and analyzed. The absence of this evidence is problematic because it increases uncertainty; administrators cannot reasonably predict the outcomes of their policy choices which elevates risk to themselves and the students and institutions they serve (Kowalski, Lasley, & Mahoney, 2008).

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CHAPTER III

METHODOLOGY

Introduction

The purpose of this study was to generate data and reach conclusions that will enhance the ability of administrators to improve institutional financial aid decisions. Specifically, the research (a) examined differences in institutional aid among the largest 4year PNP institutions in the Midwest, (b) determined the level of association between institutional grants and measures of institutional goals, (c) determined the level of association between institutional grants and measures of institutional goals when controlling for the effects of *total full-time undergraduate headcount* and *institutional wealth* and (d) determined whether the practice of tuition discounting has benefited the largest 4-year PNP institutions in the Midwest over the past decade.

The variables of this study were categorized as institutional goal and institutional grant variables. Institutional goal variables were further categorized as measures of diversity (ethnic, racial, and socioeconomic), enrollment (*acceptance rate, admission index, admission yield, average 75th percentile ACT score, completion rate, freshmen enrollment increases, freshmen to sophomore retention rate, and total full time undergraduate headcount*), and financial (*tuition and fees, net tuition and fees, recipient net tuition and fees, and institutional wealth*). Institutional grant variables were *freshmen discount rate, freshmen grant recipient discount rate, freshmen grant recipient discount rate, average monetary value for the*

freshman class, average monetary value per freshman grant recipient, and *percentage of freshmen grant recipients.* The data was collected from the U.S. Department of Education's Integrated Postsecondary Education Data System (IPEDS). To alleviate 1-year exceptions or anomalies, the 3-year average for each variable was used for time-periods A and B.

Research Questions

The following three research questions, applied to the study population, guided the inquiry.

- 1. What are the characteristics of each institution as described by internal grant and goal variables?
 - Institutional grant variables: *average monetary value for the freshman class*, *average monetary value per freshman grant recipient, percentage of freshmen grant recipients, freshmen discount rate* and *freshmen grant recipient discount rate*.
 - Institutional goal variables:
 - i. Diversity: racial and ethnic, and socioeconomic;
 - Enrollment: acceptance rate, admission index, admission yield, average
 75th percentile ACT score, completion rate, freshmen enrollment
 increases, freshmen-to-sophomore retention rate, total full time
 undergraduate headcount; and
 - iii. Financial: *institutional wealth, tuition and fees, net tuition and fees,* and *recipient net tuition and fees.*
- 2. What levels of association existed between the institutional grant variables and the institutional goal variables when (a) no data were adjusted; (b) differences in

total full-time undergraduate headcount were controlled; (c) differences in *institutional wealth* were controlled?

3. Has the practice of tuition discounting benefited the largest 4-year PNP institutions in the Midwest?

Data and Population

Data

Institutional grant data and diversity, enrollment, and financial data were collected from the U.S. Department of Education's Integrated Postsecondary Education Data System (IPEDS) for each time-period of this study. IPEDS is the postsecondary education data collection program for the National Center for Education Statistics (NCES). It contains data on enrollments, program completions, graduation rates, faculty, staff, finances, pricing, and student financial aid. To alleviate 1-year exceptions or anomalies, the 3-year average for each variable was used for time-periods A and B.

Population

The defined population for this study was the 30 largest 4-year PNP institutions having a primary location in a Midwest state and having students between the ages of 18 and 24 constituting at least 85% of undergraduate enrollment. As defined here, the Midwest states included Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin. Members of the study population are listed in Appendix A.

Variables

Variables in this study are classified as continuous ratio scale. Table 1 contains a summary of the variables of this study.

Table 1

Summary of Variables.

Variable Number	Variable Category	Variable Name	Variable Measurement	Time Period A	Time Period B
1	Diversity	Racial and ethnic diversity	Percent of non-White freshmen enrolled	1999, 2000, 2001	2009, 2010, 2011
2	Diversity	Socioeconomic diversity	Percent of freshmen who received a 1998, federal Pell grant 1999, 200		2008, 2009, 2010
3	Enrollment	Acceptance rate	Percentage calculated by dividing the number of freshmen who were admitted by the total number of freshmen who applied for admission	2001, 2002, 2003	2009, 2010, 2011
4	Enrollment	Admission index	Admission yield divided by the acceptance rate	2001, 2002, 2003	2009, 2010, 2011
5	Enrollment	Admission yield	Percentage calculated by dividing the number of freshmen enrolled by the number of freshmen admitted for the fall term of enrollment	2001, 2002, 2003	2009, 2010, 2011
6	Enrollment	Average 75 th percentile ACT score	Average 75P th P percentile composite ACT score for applicants who were admitted to become freshmen		2009, 2010, 2011
7	Enrollment	Completion rate	Percent of freshmen who completed their program in 150% of the normal time	1998, 1999, 2000	2008, 2009, 2010
8	Enrollment	Freshmen enrollment increases	Percentage increase (or negative increase) of freshmen enrolled at each institution	1999, 2000, 2001	2009, 2010, 2011
9	Enrollment	Freshmen-to- sophomore retention rates	Percentage of freshmen who returned as either full time or part time students for the following academic year	2003, 2004, 2005	2009, 2010, 2011
10	Enrollment	Total full-time undergraduate headcount	Number of undergraduate students enrolled for 12 or more semester credits, or 12 or more quarter credits, or 24 or more contact hours a week each term19		2008, 2010, 2011
11	Financial	Institutional wealth	Average dollar value calculated by dividing the fiscal year end total asset value by the number of full-time undergraduates	1997, 1998, 1999	2008, 2009, 2010
12	Financial	Tuition and fees	Average dollar value charged to freshmen	1999, 2000, 2001	2008, 2009, 2010
13	Financial	Net tuition and fees	Average dollar value charged to freshmen after deducting the average monetary value for the freshman class	1999, 2000, 2001	2008, 2009, 2010
14	Financial	Recipient net tuition and fees	Average dollar value charged to freshmen who received an institutional grant after deducting the average monetary value per freshman grant recipient	1999, 2000, 2001	2008, 2009, 2010
15	Institutional grant	Freshmen discount rate	Percent tuition discount for the freshman class	1999, 2000, 2001	2008, 2009, 2010
16	Institutional grant	Freshmen grant recipient discount rate	Percent tuition discount per freshman grant recipient	1999, 2000, 2001	2008, 2009, 2010
17	Institutional grant	Percentage of freshmen grant recipients	Percent of freshmen who received an institutional grant	1999, 2000, 2001	2008, 2009, 2010

Statistical Methods

This non-experimental, longitudinal, retrospective study used data from its entire population. As the variables were not controlled, causation is not hypothesized (Krathwohl, 2009). As a population study, all statistical reports are descriptive rather than inferential. Levels of association were determined by calculating Pearson product-moment correlation coefficients and applying them as descriptive statistics as specified by Cohen and Cohen (1983); *small* associations were identified by correlation coefficients with absolute values from .01 to .29, *medium* associations were identified by correlation coefficients with absolute values from .30 to .49, and *large* associations were identified by correlation coefficients with absolute statistical sciences (Chen & Popovich, 2002; Green & Salkind, 2008).

Research Question 1 was answered using frequency distributions and measures of central tendency – mean and median - to describe each of the data elements. Also, measures of variation – range and standard deviation - were used to describe the extent to which the data values differed from each other, their consistency, and the accuracy of the central tendency descriptions. Part (a) of Research Question 2 was answered using Pearson product moment correlations to assess the level of association between each of the variables of this study. Scatter plots of the data points were examined to visually determine linearity between the variables. "The Pearson correlation coefficient describes the linear relationship between two interval variables, two ratio variables, or one interval and one ratio variable" (Heiman, 2006, p. 155). Use of the Pearson correlations in this fashion is purely descriptive and no conclusions about causality can safely be made (Kachigan, 1991, p. 4). Also, as a descriptive statistic, the Pearson technique did not require the assumption of a bivariate normal

distribution (Chen & Popovich, 2002). Part (b) of Research Question 2 was answered using partial correlations to assess the level of association between the variables of this study holding *total full-time undergraduate headcount* constant. Part (c) of Research Question 2 was answered using partial correlations to assess the level of association between the variables of this study holding *institutional wealth* constant. Questions 1 and 2 were answered for both time-periods A and B.

Question 3 was answered using correlations to assess the levels of association of the changes between each of the variables from time-period A to time-period B. To assess whether tuition discounting has benefited the institutions of this study, the institutions were first ranked in descending order by the percentage change in tuition discount rate for the freshmen class from time-period A to time-period B and then divided three ways into large change, medium change, and small change groups to allow for comparisons between institutions with higher tuition discount rate changes and institutions with lower tuition discount rate changes.

Preliminary analysis of data to clarify relationships between and among variables, but not directly addressing the association of variables, was conducted prior to analyzing the data to answer the research questions. These preliminary analyses explored relationships between variables that could potentially be dependent. For example, Pearson product-moment correlation coefficients were computed to test the strength of the associations between *recipient net tuition and fees* and *net tuition and fees* to test whether the potentially high proportion of students who were recipients of institutional grants makes *recipient net tuition and fees* and *net tuition and fees* highly correlated.

Limitations

The results of this study are subject to threats of statistical conclusion validity, internal validity, reliability, and external validity. The validity of the inferences made using the multiple correlation and multiple regression equations are subject to threats of statistical conclusion validity (Shadish, Cook, & Campbell, 2002). "In correlation studies we have no control over the values of the variables possessed by the objects under study" (Kachigan, 1991, p. 118). Essentially, the researcher's control of confounding variables is limited; therefore, statistical conclusions about the association of variables in this study must be made with caution.

Threats to internal validity and reliability are due to the use of IPEDS data, which is self-reported and is subject to data entry errors at the institutional level. There is evidence these threats are minimal. A 2005 study by Jackson, Jang, Sukasih, and Peecksen examined the validity and reliability of IPEDS data. These authors concluded that very few institutions modified original IPEDS submissions and "among those that did, the magnitude of the change has very little impact on the originally reported data" (Jackson, Jang, Sukasih, & Peecksen, 2005, p. ix).

Finally, a threat to external validity exists because this study is limited to larger private institutions in the Midwest; therefore, the results cannot be generalized to institutions outside the scope of this study. Moreover, the objects of this study were institutions; therefore, the results are not intended for other objects such as smaller sub units of the institution (i.e. academic departments, etc.), groups of students, or individual students. Extending the results to these situations would be an example of ecological fallacy, inferring relationships at individual levels based on relationships derived from aggregate data (Chen & Popovich, 2002, p. 67).

Summary

This study was descriptive, non-experimental and was an ex-post facto study in which the researcher had no control over the values of the objects used in the study. The researcher's purpose was to describe patterns in existing data and to assess any association between certain institutional grant and institutional goal variables. This study will help inform the strategies of distribution of institutional grants at larger 4-year PNP institutions in the Midwest. The following chapters report the results of this analysis and provide a discussion of findings and conclusions.

CHAPTER IV

STUDY FINDINGS

Introduction

Findings in this chapter were drawn from data collected from the Integrated Postsecondary Education Data System (IPEDS). Descriptive statistics are provided for each of the institutions, the overall population and the variables of this study. Correlations and partial correlations within the grant, diversity, enrollment and financial categories are included in the descriptive sections. Analyses of the variables and presentations of the correlations and partial correlations follow the descriptive statistics.

Study Population Profile

Data were collected and entered for the 30 largest 4-year PNP institutions with a primary location in a Midwest state and having students between the ages of 18 and 24 constituting at least 85% of total full-time undergraduate enrollment. The study population was determined by ranking the eligible institutions by the average total full-time undergraduate enrollment in the fall terms 2001 through 2010. As defined here, Midwest states included Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin. These are representative states to the Midwest Association of Student Financial Aid Administrators (MASFAA).

The 30 largest 4-year PNP institutions shared common traits such as legal operating structure, location and student body composition, to name a few. As PNP institutions, they

were legally recognized by the statutes of their respective states as non-profit corporations in which the controlling individuals or agencies received no compensation other than wages, rent, or other expenses for the assumption of risk. Some but not all of the institutions were affiliated with religious organizations. In every case, these institutions enjoyed greater freedom from government oversight or control of public shareholders than did public and for-profit colleges and universities. Further, these institutions were located in Midwest states that had experienced similar economic and socio-demographic trends over the time period of this study. Finally, by definition, the institutions of this study served primarily traditional college students between the ages of 18 and 24.

Members of the study population also had distinguishing characteristics. Most notably, they were not homogeneous with respect to Carnegie classification, scope of educational offerings, geographic setting (e.g., urban or rural), student population demographics (e.g., primarily local or primarily national student body, religious affiliation), and length of existence.

Individual Institutional Profiles

This section includes profiles of each of the 30 institutions, including data for each of the variables and time periods as defined in Table 2. The change between the earlier time period (time period A) and the more recent time period (time period B) is also displayed for each variable. Finally, the relative rank for each variable is the respective institution's rank when the variables are ordered by the change between time period A and time period B. Table 33 is a summary of variables for the entire study population.

The narratives indicate each institution's location and its *freshmen discount rate* change category (high change, medium change, low change) from period A to period B. The

high change category represents the 10 institutions with the highest average *freshmen discount rate* increase. The medium change category represents the 10 institutions that experienced increases in *freshmen discount rate* that were less than the high change institutions and greater than the low change institutions. The low change category represents the 10 institutions with the lowest increase in *freshmen discount rates*. In this study, the low change institutions experienced negative increases, otherwise understood as decreases, in *freshmen discount rates*. The institutions and their associated categories are listed in appendix A. The narratives also include comments about diversity, enrollment, financial or institutional grant variables where the institutions experienced high or low changes compared to the population. Short variable names are used in the tables within the analysis of variables section and full variable names are used in text references. These references are italicized to aid in readability and understanding.

Table 2

Variable Number	Variable Category	Variable Name	Variable Measurement	Time Period A	Time Period B
1	Diversity	Racial and ethnic diversity	Percent of non-White freshmen enrolled	1999, 2000, 2001	2009, 2010, 2011
2	Diversity	Socioeconomic diversity	Percent of freshmen who received a federal Pell grant	1998, 1999, 2000	2008, 2009, 2010
3	Enrollment	Acceptance rate	Percentage calculated by dividing the number of freshmen who were admitted by the total number of freshmen who applied for admission	2001, 2002, 2003	2009, 2010, 2011
4	Enrollment	Admission index	Admission yield divided by the acceptance rate	2001, 2002, 2003	2009, 2010, 2011
5	Enrollment	Admission yield	Percentage calculated by dividing the number of freshmen enrolled by the number of freshmen admitted for the fall term of enrollment	2001, 2002, 2003	2009, 2010, 2011
6	Enrollment	Average 75P th P percentile ACT score	Average 75P th P percentile composite ACT score for applicants who were admitted to become freshmen	2001, 2002, 2003	2009, 2010, 2011
7	Enrollment	Completion rate	Percent of freshmen who completed their program in 150% of the normal time	1998, 1999, 2000	2008, 2009, 2010

Summary of Variables.

8	Enrollment	Freshmen enrollment increases	Percentage increase (or negative increase) of freshmen enrolled at each institution	1999, 2000, 2001	2009, 2010, 2011
9	Enrollment	Freshmen-to- sophomore retention rates	Percentage of freshmen who returned as either full time or part time students for the following academic year	2003, 2004, 2005	2009, 2010, 2011
10	Enrollment	Total full-time undergraduate headcount	Number of undergraduate students enrolled for 12 or more semester credits, or 12 or more quarter credits, or 24 or more contact hours a week each term	1997, 1998, 1999	2008, 2010, 2011
11	Financial	Institutional wealth	Average dollar value calculated by dividing the fiscal year end total asset value by the number of full- time undergraduates	1997, 1998, 1999	2008, 2009, 2010
12	Financial	Tuition and fees	Average dollar value charged to freshmen	1999, 2000, 2001	2008, 2009, 2010
13	Financial	Net tuition and fees	Average dollar value charged to freshmen after deducting the average monetary value for the freshman class	1999, 2000, 2001	2008, 2009, 2010
14	Financial	Recipient net tuition and fees	Average dollar value charged to freshmen who received an institutional grant after deducting the average monetary value per freshman grant recipient	1999, 2000, 2001	2008, 2009, 2010
15	Institutional grant	Freshmen discount rate	Percent tuition discount for the freshman class	1999, 2000, 2001	2008, 2009, 2010
16	Institutional grant	Freshmen grant recipient discount rate	Percent tuition discount per freshman grant recipient	1999, 2000, 2001	2008, 2009, 2010
17	Institutional grant	Percentage of freshmen grant recipients	Percent of freshmen who received an institutional grant	1999, 2000, 2001	2008, 2009, 2010

Baldwin Wallace University, located in Berea, Ohio, had a medium change to *freshmen discount rate* and experienced the largest change in *socioeconomic diversity*. Baldwin Wallace experienced average changes in other enrollment characteristics with the exception of a large increase in *freshmen to sophomore retention rates*. Other notable changes included a decrease in the *acceptance rate* and increases in the *freshmen discount rate*, *net tuition and fees*, and *institutional wealth*.

Table 3

Profile of Baldwin Wallace University.

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	13.86%	17.49%	3.63%	22
Socioeconomic	19.37%	36.64%	17.27%	1
Enrollment				
Acceptance rate	82.40%	64.92%	-17.48%	7
Yield	39.84%	30.35%	-9.49%	19
Admission Index	48.35%	46.74%	-1.61%	9
75th % ACT	26.00	26.33	1.27%	25
Completion Rate	64.83%	70.54%	5.71%	18
Fr. Enrollment Change	-1.16%	-3.34%	-2.18%	22
Retention Rates	73.50%	82.59%	9.09%	3
FT UG Enrollment	2,872	3,109	8.25%	19
Financial				
Wealth	70,350	156,086	121.87%	25
Net T&F	8,507	13,012	53.0%	21
T&F	15,428	24,325		25
Recipient Net T&F	6,874	12,547		21
Institutional Grant				
% Recipients	80.91%	96.05%	15.14%	9
Recipient Discount Rate	55.44%	48.42%	-7.03%	15
Freshmen Discount Rate	44.86%	46.51%	1.65%	14

Bethel University, located in St. Paul, Minnesota, had a high change in *freshmen discount rate* and experienced a large increase in *socioeconomic diversity* and *institutional wealth*. Bethel was also among the six institutions in the study population that experienced an

increase in acceptance rate. Finally, Bethel had a large change in freshmen grant recipient

discount rate.

Table 4

Profile of Bethel University.

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	4.19%	11.20%	7.01%	13
Socioeconomic	18.65%	30.82%	12.17%	4
Enrollment				
Acceptance rate	81.20%	83.82%	2.62%	27
Yield	45.90%	37.81%	-8.09%	13
Admission Index	56.52%	45.11%	-11.41%	19
75th % ACT	27.00	28.00	3.70%	10
Completion Rate	69.03%	71.86%	2.83%	24
Fr. Enrollment Change	8.37%	4.85%	-3.52%	25
Retention Rates	85.33%	85.10%	-0.23%	22
FT UG Enrollment	2,369	2,692	13.63%	15
Financial				
Wealth	35,053	116,200	231.50%	5
Net T&F	11,298	15,926	41.0%	25
T&F	16,066	26,961	67.8%	14
Recipient Net T&F	10,676	15,815	5,139	24
Institutional Grant				
% Recipients	88.46%	99.00%	10.54%	16
Recipient Discount Rate	33.55%	41.34%	7.79%	6
Freshmen Discount Rate	29.68%	40.93%	11.25%	5

Bradley University, located in Peoria, Illinois, had a large change in *freshmen discount rate* and experienced the third largest increase in *racial and ethnic diversity* and the
sixth largest increase in *socioeconomic diversity*. The institution also had increases in *acceptance rate, completion rate* and *institutional wealth*. Bradley also experienced the largest increase in the *percentage of freshmen grant recipients*.

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	13.54%	31.89%	18.35%	3
Socioeconomic	16.50%	24.63%	8.13%	6
Enrollment				
	67 00%	71 770/	2 780/	20
	07.99%	71.770	5.7870	29
Yield	30.39%	23.86%	-6.53%	10
Admission Index	44.70%	33.24%	-11.46%	24
75th % ACT	28.00	27.66	-1.21%	27
Completion Rate	66.48%	76.14%	9.66%	5
Fr. Enrollment Change	1.96%	-0.19%	-2.15%	23
Retention Rates	88.00%	86.80%	-1.20%	27
FT UG Enrollment	4,400	4,762	8.23%	20
Financial				
Wealth	71,058	234,044	229.37%	6
Net T&F	10,653	14,586	36.9%	27
T&F	14,659	24,196	65.1%	16
Recipient Net T&F	7,917	14,095	6,178	17
In stitutional Count				
Institutional Grant				
% Recipients	59.43%	95.14	% 35.71%	1
Recipient Discount Rate	45.99%	41.75	% -4.25%	14
Freshmen Discount Rate	27.33%	39.72	% 12.39%	4

Butler University, located in Indianapolis, Indiana, had a medium change in *freshmen discount rate* and had a large increase in *percentage of freshmen grant recipients*. It experienced large declines in *admission index*, *acceptance rate* and *admission yield*. Otherwise, Butler experienced average changes with the exception of a small increase in *racial and ethnic diversity* and large increases in the *average 75th percentile ACT* score and *completion rates*.

Table 6

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	15.08%	16.40%	1.32%	26
Socioeconomic	11.57%	16.50%	4.93%	12
Enrollment				
Acceptance rate	80.28%	69.55%	-10.73%	12
Yield	31.32%	18.64%	-12.68%	25
Admission Index	39.02%	26.80%	-12.22%	26
75th % ACT	28.36	30.00	5.78%	4
Completion Rate	64.86%	74.27%	9.41%	6
Fr. Enrollment Change	0.79%	0.15%	-0.64%	18
Retention Rates	87.67%	88.68%	1.01%	14
FT UG Enrollment	3,122	3,751	20.15%	11
Financial				
Wealth	77,903	186,375	139.24%	23
Net T&F	11,247	18,182	61.7%	16
T&F	18,076	29,403	62.7%	19
Recipient Net T&F	8,419	16,503	8,084	10
Institutional Grant				
% Recipients	70.71%	86.99%	16.28%	7

Profile of Butler University.

Recipient Discount Rate	53.42%	43.87%	-9.55%	18
Freshmen Discount Rate	37.78%	38.16%	0.38%	17

Calvin College, located in Grand Rapids, Michigan, had a high change to *freshmen discount rate* and experienced large declines in *total full-time undergraduate headcount* and *admission yield*. Calvin experienced higher than average changes to measures of diversity and it experienced the greatest percentage increase to *institutional wealth*.

Table 7

Variable	Period A	Period B	Chang	ge Re	elative Rank
Diversity					
Racial and Ethnic		14.84%	23.78%	8.94%	10
Socioeconomic		16.99%	25.05%	8.06%	7
Enrollment					
Acceptance rate		98.44%	85.94%	-12.50%	10
Yield		55.37%	39.92%	-15.45%	28
Admission Index		56.24%	46.45%	-9.79%	14
75th % ACT		28.00	29.00	3.57%	15
Completion Rate		69.64%	75.61%	5.97%	17
Fr. Enrollment Change		1.86%	0.86%	-1.00%	19
Retention Rates		86.50%	86.39%	-0.11%	21
FT UG Enrollment		3,891	3,794	-2.49%	28
Financial					
Wealth		57,581	234,314	306.93%	1
Net T&F		9,670	14,711	52.1%	22
T&F		14,102	24,023	70.4%	12
Recipient Net T&F		8,739	14,442	14,442	19
Institutional Grant					
% Recipients		82.64%	97.19%	14.55%	10

Profile of Calvin College

Recipient Discount Rate	38.03%	39.88%	1.85%	9
Freshmen Discount Rate	31.43%	38.76%	7.33%	10

Case Western University, located in Cleveland, Ohio, had a low change to *freshmen discount rate*. In fact, the institution experienced a large decrease in *freshmen discount rate* but still maintained a *freshmen discount rate* above the study population mean in both periods A and B. The institution also increased *freshmen grant recipient discount rate*. Case Western experienced the second largest increase in *racial and ethnic diversity* and simultaneously experienced a large decrease in *socioeconomic diversity*. This institution maintained high levels of *average 75th percentile ACT scores, freshmen to sophomore retention rates* and *completion rates*. Despite large changes to other financial variables, the institution had the lowest increase in *institutional wealth*. Case Western, like a few other study population schools with high *institutional wealth* in period A, experienced low percentage gains in *institutional wealth*.

Profile of Case	Western Reserve	University.
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Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	26.40%	47.01%	20.61%	2
Socioeconomic	35.93%	27.12%	-8.81%	28
Enrollment				
Acceptance rate	75.53%	60.80%	-14.73%	8
Yield	23.56%	15.32%	-8.24%	14
Admission Index	31.19%	25.19%	-6.00%	18
75th % ACT	32.15	33.06	2.83%	21
Completion Rate	73.35%	81.21%	7.86%	11
Fr. Enrollment Change	-3.55%	-3.94%	-0.39%	16

Retention Rates	91.67%	92.27%	0.60%	16	
FT UG Enrollment	3,071	4,011	30.61%	8	
Financial					
Wealth	771,308	1,278,083	65.70%	30	
Net T&F	8,103	19,378	139.1%	4	
T&F	20,251	36,363	79.6%	4	
Recipient Net T&F	(1,288)	14,152	15,440	4	
Institutional Grant					
% Recipients	56.40%	76.47%	20.07%	5	
Recipient Discount Rate	106.36%	61.08%	-45.28%	25	
Freshmen Discount Rate	59.99%	46.71%	-13.28%	23	

Cedarville University, located in Cedarville, Ohio, had a high change in *freshmen discount rate* and also had large increases in *freshmen grant recipient discount rate*. Despite these high changes Cedarville's *freshmen grant recipient discount rate* and *freshmen discount rate* were among the lowest in the study population, ranking only higher than Columbia College, Chicago University and the University of Northwestern Ohio. Cedarville experienced the greatest decline in *socioeconomic diversity*. It also experienced large declines in *completion rate*. Cedarville had the largest increase in *tuition and fees*.

Table 9

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Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	3.41%	10.61%	7.20%	12
Socioeconomic	56.37%	19.50%	-36.87%	30
Enrollment				
Acceptance rate	78.05%	75.29%	-2.76%	23

Profile of Cedarville University

Yield	45.34%	35.58%	-9.76%	20	
Admission Index	58.09%	47.25%	-10.84%	16	
75th % ACT	28.00	28.66	2.36%	23	
Completion Rate	65.06%	67.84%	2.78%	26	
Fr. Enrollment Change	1.51%	3.80%	2.29%	8	
Retention Rates	81.67%	84.40%	2.73%	8	
FT UG Enrollment	2,554	2,939	15.07%	14	
Financial					
Wealth	33,772	90,031	166.58%	15	
Net T&F	9,367	15,828	69.0%	13	
T&F	11,559	22,309	93.0%	1	
Recipient Net T&F	8,479	14,553	6,074	18	
Institutional Grant					
% Recipients	71.16%	83.56%	12.40%	13	
Recipient Discount Rate	26.65%	34.77%	8.12%	5	
Freshmen Discount Rate	18.96%	29.05%	10.09%	7	

Columbia College, located in Chicago, Illinois is primarily focused on arts and media education, which makes it different from most liberal arts institutions comprising a majority of the study population. This institution had a low change in *freshmen discount rate* with a decrease of 19.72%. It has experienced large increases in *completion rates, freshmen-tosophomore retention rates* and *total full-time undergraduate headcount*, growing over 67% over the 10-year span examined in this study. Institutional grant opportunities have been limited and Columbia College ranked near the bottom in *completion rates* for both Period A and Period B. None the less, Columbia College has improved its *completion rate* and *freshmen to sophomore retention rates* and also experienced a large percentage improvement in *net tuition and fees* and *institutional wealth*.

Table 10

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	46.25%	43.62%	-2.63%	27
Socioeconomic	31.55%	33.66%	2.11%	18
Enrollment				
Completion Rate	23.69%	37.39%	13.70%	2
Fr. Enrollment Change	5.81%	-3.33%	-9.14%	27
Retention Rates	61.33%	65.51%	4.18%	6
FT UG Enrollment	6,075	10,146	67.01%	5
Financial				
Wealth	24,723	74,686	202.09%	10
Net T&F	8,424	17,196	104.1%	8
T&F	11,872	22,309	59.9%	22
Recipient Net T&F	na	na	na	na
Institutional Grant				
% Recipients	6.73%	30.55%	23.82%	3
Freshmen Discount Rate	29.04%	9.42%	-19.62%	27

Profile of Columbia College – Chicago

Concordia College at Moorhead, located in Moorhead, Minnesota, had a high change to *freshmen discount rate* and experienced a large increase in *acceptance rate* and a high change in *admission yield*. It had the second largest decrease in *total full-time undergraduate enrollment* and the largest decrease in *completion rates*. The institution also experienced a small increase in *institutional wealth*. This despite having the second largest increase in *tuition and fees*.

Table 11

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	9.79%	12.77%	2.98%	24
Socioeconomic	24.72%	24.95%	0.23%	22
Enrollment				
Acceptance rate	85.20%	88.33%	3.13%	28
Yield	35.93%	33.86%	-2.07%	5
Admission Index	42.17%	38.33%	-3.84%	11
75th % ACT	26.68	28.00	4.95%	7
Completion Rate	66.41%	47.22%	-19.19%	30
Fr. Enrollment Change	-1.11%	-2.17%	-1.06%	20
Retention Rates	78.00%	84.01%	6.01%	5
FT UG Enrollment	2,822	2,684	-4.89%	29
Financial				
Wealth	79,352	196,657	147.83%	21
Net T&F	8,560	13,959	63.1%	15
T&F	13,787	25,609	85.7%	2
Recipient Net T&F	8,018	13,713	5,695	20
Institutional Grant				
% Recipients	90.60%	97.93%	7.33%	19
Recipient Discount Rate	41.84%	46.45%	4.61%	8
Freshmen Discount Rate	37.91%	45.49%	7.58%	9

Profile of Concordia College at Moorhead

DePaul University, located in Chicago, Illinois, had a medium change in *freshmen discount rate* and experienced a large increase in *total full time undergraduate headcount*, including *freshmen enrollment increases* in excess of 10% during time period A. DePaul also experienced large increases in average 75th percentile ACT scores, freshmen-to-sophomore

retention rates and completion rates.

Table 12

Profile of DePaul University

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	37.78%	41.06%	3.28%	23
Socioeconomic	28.30%	32.23%	3.93%	13
Enrollment				
Acceptance rate	74.54%	66.98%	-7.56%	16
Yield	32.41%	27.08%	-5.33%	8
Admission Index	43.47%	40.44%	-3.03%	10
75th % ACT	26.00	27.33	5.12%	6
Completion Rate	57.16%	64.86%	7.70%	12
Fr. Enrollment Change	12.22%	-0.92%	-13.14%	30
Retention Rates	83.33%	86.14%	2.81%	7
FT UG Enrollment	7,000	13,272	89.60%	2
Financial				
Wealth	71,902	175,181	143.64%	22
Net T&F	9,792	16,532	68.8%	14
T&F	15,755	27,159	72.4%	9
Recipient Net T&F	6,796	14,045	7,249	13
Institutional Grant				
% Recipients	66.56%	81.03%	14.47%	11
Recipient Discount Rate	56.86%	48.29%	-8.58%	16
Freshmen Discount Rate	37.85%	39.13%	1.28%	16

Drake University, located in Des Moines, Iowa, had a medium change to *freshmen discount rate* and experienced a large decline in *acceptance rate* and a small increase in *total* *full-time undergraduate headcount*. It also experienced a small increase in *institutional wealth*, a small decrease in *freshman grant recipient discount rate*, and small increases in *tuition and fees*, *net tuition and fees*, and *institutional wealth*. Finally, it had large improvements in other enrollment variables like *average 75th percentile ACT score*, *completion rate* and *freshmen enrollment increases*.

Table 13

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	16.58%	20.50%	3.92%	21
Socioeconomic	17.64%	16.15%	-1.49%	25
Enrollment				
Acceptance rate	85.60%	66.95%	-18.65%	6
Yield	32.51%	22.60%	-9.91%	21
Admission Index	37.98%	33.76%	-4.22%	13
75th % ACT	28.00	29.34	4.79%	8
Completion Rate	65.24%	74.01%	8.77%	7
Fr. Enrollment Change	-7.35%	-3.41%	3.94%	6
Retention Rates	84.67%	87.29%	2.62%	10
FT UG Enrollment	3,033	3,273	7.91%	21
Financial				
Wealth	109,798	216,310	97.01%	27
Net T&F	8,777	12,786	45.7%	24
T&F	17,097	25,811	51.0%	29
Recipient Net T&F	8,173	12,569	4,396	27
Institutional Grant				
% Recipients	93.23%	98.36%	5.13%	23
Recipient Discount Rate	52.20%	51.30%	-0.89%	10
Freshmen Discount Rate	48.66%	50.46%	1.80%	13

Profile of Drake University

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Gustavus Adolphus College, located in St. Peter, Minnesota, had a high change to *freshmen discount rate*. With an increase of 17.42%, it ranked as the 2nd highest change for the study population. Also it ranked the highest for changes in *freshmen grant recipient discount rate*. This institution experienced a decrease in freshmen enrollments in period A and successfully reversed course in period B. As a result, it had the largest percentage increase in *freshmen enrollment changes*. Finally, it experienced a 7% increase in *freshmen-to-sophomore retention rates* as well as large improvements in diversity measures.

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	6.81%	17.57%	10.76%	6
Socioeconomic	14.33%	22.65%	8.32%	5
Enrollment				
Acceptance rate	76.99%	68.44%	-8.55%	14
Yield	32.53%	26.13%	-6.40%	9
Admission Index	42.26%	38.19%	-4.07%	12
75th % ACT	28.32	29.36	3.67%	13
Completion Rate	77.21%	81.71%	4.50%	21
Fr. Enrollment Change	-9.84%	5.96%	15.80%	1
Retention Rates	84.67%	91.96%	7.29%	4
FT UG Enrollment	2,442	2,459	0.70%	26
Financial				
Wealth	86,038	213,369	147.99%	20
Net T&F	11,691	15,012	28.4%	28
T&F	18,113	31,859	75.9%	7
Recipient Net T&F	11,257	14,532	3,275	28

Profile of Gustavus Adolphus College

Institutional Grant					
% Recipients	93.68%	97.23%	3.55%	25	
Recipient Discount Rate	37.85%	54.39%	16.54%	1	
Freshmen Discount Rate	35.46%	52.88%	17.42%	2	

Hope College, located in Holland, Michigan had a medium change to *freshmen discount rate* of -1.30%. Otherwise, this institution had profile changes that mostly mirrored the changes experienced by the study population institutions. The only exceptions were the large change in the *percentage of freshman grant recipients* and the small change in *tuition and fees*.

Profile of Hope College

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	7.13%	13.20%	6.07%	15
Socioeconomic	13.99%	20.58%	6.59%	9
Enrollment				
Acceptance rate	87.45%	82.15%	-5.30%	19
Yield	40.56%	30.11%	-10.45%	22
Admission Index	46.38%	36.65%	-9.73%	20
75th % ACT	28.00	29.00	3.57%	16
Completion Rate	69.94%	76.93%	6.99%	15
Fr. Enrollment Change	0.71%	1.78%	1.07%	10
Retention Rates	88.33%	88.05%	-0.28%	23
FT UG Enrollment	2,729	3,099	13.56%	16
Financial				
Wealth	89,627	239,360	167.06%	14
Net T&F	10,060	15,799	57.0%	18
T&F	16,708	25,682	53.7%	28
Recipient Net T&F	6,875	14,678	7,803	11

Institutional Grant					
% Recipients	67.61%	89.82%	22.21%	4	
Recipient Discount Rate	58.85%	42.85%	-16.00%	22	
Freshmen Discount Rate	39.79%	38.48%	-1.31%	19	

John Carroll University, located in University Heights, Ohio, a suburb of Cleveland, had a high change in *freshmen discount rate*. This institution experienced a large increase in *racial and ethnic and socioeconomic diversity* and the greatest decline in *full-time undergraduate headcount*. It also had low rankings for changes in enrollment variables while having high rankings for changes in discount rates.

Table 16

Profile of John Carroll University

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	10.57%	20.45%	9.88%	7
Socioeconomic	16.67%	30.57%	13.90%	3
Enrollment				
Emonment		02 010/	4760/	20
Acceptance rate	86.//%	82.01%	-4.76%	20
Yield	34.63%	25.84%	-8.79%	17
Admission Index	39.91%	31.51%	-8.40%	21
75th % ACT	26.00	26.35	1.35%	24
Completion Rate	73.58%	75.94%	2.36%	27
Fr. Enrollment Change	-2.58%	-1.45%	1.13%	11
Retention Rates	86.67%	85.76%	-0.91%	25
FT UG Enrollment	3,294	2,894	-12.14%	30
Financial				
Wealth	87,308	260,740	198.64%	11
Net T&F	8,807	13,182	49.7%	23
T&F	16,582	29,024	75.0%	8
	70			

Recipient Net T&F	8,100	12,587	4,487	25	
Institutional Grant					
% Recipients	91.66%	96.38%	4.72%	24	
Recipient Discount Rate	51.15%	56.63%	5.48%	7	
Freshmen Discount Rate	46.89%	54.58%	7.69%	8	

Lewis University, located in Romeoville, Illinois, had a low change to *freshmen discount rate*. The average *freshmen discount rate* decreased by 5.33%. It experienced a large increase in *socioeconomic diversity* and *total full-time undergraduate headcount*. Lewis also experienced a large increase in *completion rates* and large decreases in *admission yield* and *admission index*.

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	30.61%	35.97%	5.36%	17
Socioeconomic	26.69%	34.69%	8.00%	8
Enrollment				
Acceptance rate	66.30%	67.05%	0.75%	26
Yield	44.03%	29.40%	-14.63%	27
Admission Index	66.41%	43.85%	-22.56%	27
75th % ACT	24.00	24.69	2.88%	20
Completion Rate	48.37%	58.44%	10.07%	3
Fr. Enrollment Change	-0.29%	4.29%	4.58%	5
Retention Rates	77.00%	79.46%	2.46%	11
FT UG Enrollment	1,979	3,419	72.76%	3
Financial				
Wealth	35,197	72,992	107.38%	26
Net T&F	6,849	12,961	89.2%	10
	71			

T&F	13,367	22,911	71.4%	10	
Recipient Net T&F	6,137	12,709	6,572	16	
Institutional Grant					
% Recipients	90.15%	97.53%	7.38%	18	
Recipient Discount Rate	54.09%	44.53%	-9.56%	19	
Freshmen Discount Rate	48.76%	43.43%	-5.33%	21	

Loyola University, Chicago, is located in Chicago, Illinois and had a low change to *freshmen discount rate* with a decrease of 9.45%. Similar to neighboring DePaul and Lewis Universities, Loyola had a large increase in *full-time undergraduate headcount*. It also experienced a large decrease in *racial and ethnic diversity* and recent decreases in *freshmen enrollment changes*. Loyola experienced the second largest increase in *75th percentile ACT* scores and low changes in *completion rates*. Loyola has kept increases in *tuition and fees* small.

Table 18

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	38.96%	33.22%	-5.74%	29
Socioeconomic	25.16%	26.74%	1.58%	19
Enrollment				
Acceptance rate	74.62%	64.11%	-10.51%	13
Yield	21.45%	17.89%	-3.56%	6
Admission Index	28.75%	27.90%	-0.85%	8
75th % ACT	27.00	29.00	7.41%	2
Completion Rate	65.58%	67.19%	1.61%	29
Fr. Enrollment Change	7.72%	-3.91%	-11.63%	29
Retention Rates	83.50%	85.77%	2.27%	12

Profile of Loyola University – Chicago.

FT UG Enrollment	5,344	8,976	67.96%	4
Financial				
Wealth	150,117	291,177	93.97%	28
Net T&F	9,704	18,734	93.1%	9
T&F	18,838	22,911	63.1%	18
Recipient Net T&F	8,097	17,682	9,585	7
Institutional Grant				
% Recipients	85.04%	91.93%	6.89%	20
Recipient Discount Rate	57.02%	42.46%	-14.56%	20
Freshmen Discount Rate	48.49%	39.03%	-9.45%	22

Marquette University, located in Milwaukee, Wisconsin, had a medium change to *freshmen discount rate* with a change of -4.87%. It experienced the third greatest decline in *acceptance rate*. The institution also experienced large increases in *racial and ethnic diversity* and *institutional wealth*, and had positive *freshmen enrollment changes*. Finally, it had large changes to *recipient net tuition and fees* and *percentage of freshmen grant recipients*.

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	14.16%	25.26%	11.10%	5
Socioeconomic	11.30%	17.45%	6.15%	11
Enrollment				
Acceptance rate	85.03%	61.20%	-23.83%	3
Yield	28.52%	16.13%	-12.39%	24
Admission Index	33.54%	26.36%	-7.18%	22
75th % ACT	28.00	29.00	3.57%	17

Profile of Marquette University

Completion Rate	72.15%	79.08%	6.93%	16
Fr. Enrollment Change	-1.40%	1.83%	3.23%	7
Retention Rates	89.50%	88.93%	-0.57%	24
FT UG Enrollment	6,647	7,773	16.94%	12
T ¹ 1				
Financial				
Wealth	87,307	284,970	226.40%	7
Net T&F	9,687	17,658	82.3%	11
T&F	17,438	29,225	67.6%	15
Recipient Net T&F	7,377	16,894	9,517	8
Institutional Grant				
% Recipients	77.04%	93.81%	16.77%	6
Recipient Discount Rate	57.70%	42.19%	-15.50%	21
Freshmen Discount Rate	44.45%	39.58%	-4.87%	20

Northwestern University, located in Evanston, Illinois had a low change to *freshmen discount rate*. In fact, this institution had very large declines in *recipient discount rate* and *freshmen discount rate*. It experienced large increases in *net tuition and fees*, the largest increase in *recipient net tuition and fees*, and large increases in *institutional wealth*. In relation to the study population, Northwestern University's other profile changes were average.

Variable	Period A	Period B	Change	Relative Rank	
Diversity					
Racial and Ethnic	39.68%	44.16%	4.48%	19	
Socioeconomic	10.34%	11.19%	0.85%	21	
Enrollment					
Acceptance rate	33.28%	25.42%	-7.86%	15	

Profile of Northwestern University

Yield	40.83%	31.97%	-8.86%	18
Admission Index	122.70%	125.77%	3.07%	7
75th % ACT	33.94	34.80	2.53%	22
Completion Rate	91.46%	94.33%	2.87%	25
Fr. Enrollment Change	0.59%	0.47%	-0.12%	15
Retention Rates	97.33%	96.32%	-1.01%	26
FT UG Enrollment	7,665	8,462	10.40%	18
Financial				
Wealth	622,917	2,025,989	225.24%	8
Net T&F	10,662	26,065	144.5%	3
T&F	24,660	38,615	56.6%	26
Recipient Net T&F	(8,639)	14,096	22,735	1
Institutional Grant				
% Recipients	42.04%	51.18%	9.14%	17
Recipient Discount Rate	135.03%	63.50%	-71.54%	29
Freshmen Discount Rate	56.76%	32.50%	-24.26%	29

Oberlin College, located in Oberlin, Ohio, had a low change in *freshmen discount rate*, decreasing nearly 19%. This institution also had low changes in diversity variables including a decrease in *socioeconomic diversity*. Oberlin experienced a large increase in its *admission index, admission yield, average* 75th *percentile ACT scores,* and *completion rate* and had the second largest increase in the *percentage of freshmen grant recipients*.

Table 21

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	24.70%	27.68%	2.98%	25
Socioeconomic	13.37%	9.81%	-3.56%	27

Profile of Oberlin College

Enrollment

Acceptance rate	35.80%	31.28%	-4.52%	21	
Yield	35.21%	34.30%	-0.91%	4	
Admission Index	98.34%	109.66%	11.32%	5	
75th % ACT	32.18	33.54	4.23%	9	
Completion Rate	77.43%	85.69%	8.26%	9	
Fr. Enrollment Change	-0.99%	-0.49%	0.50%	13	
Retention Rates	91.67%	93.17%	1.50%	13	
FT UG Enrollment	2,848	2,884	1.26%	24	
Financial					
Wealth	301,088	680,452	126.00%	24	
Net T&F	10,094	23,511	132.9%	5	
T&F	25,334	39,968	57.8%	24	
Recipient Net T&F	(372)	20,274	20,646	2	
Institutional Grant					
% Recipients	59.29%	83.56%	24.27%	2	
Recipient Discount Rate	101.47%	49.27%	-52.19%	27	
Freshmen Discount Rate	60.16%	41.18%	-18.98%	26	

Saint Louis University, located in St. Louis, Missouri, was in the low change category and experienced a 13.56% decline in *freshmen discount rate*. It also experienced a large decline in *admission index* and had the largest decline in the *percentage of freshmen grant recipients*. Saint Louis ranked 28th out of 30 institutions in *freshmen to sophomore retention rate* changes. Saint Louis had a large improvement in *average 75th percentile ACT scores* and *racial and ethnic diversity*. Despite its strong enrollment, low discount rates, and high changes in *net tuition and fees*, the university experienced a low change in *institutional wealth*.

Table 22

Profile of Saint Louis University

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	20.23%	32.17%	11.94%	4
Socioeconomic	20.66%	18.21%	-2.45%	26
Enrollment				
Acceptance rate	71.51%	67.81%	-3.70%	22
Yield	32.49%	21.29%	-11.20%	23
Admission Index	45.43%	31.40%	-14.03%	25
75th % ACT	28.66	30.32	5.79%	3
Completion Rate	65.37%	73.13%	7.76%	14
Fr. Enrollment Change	1.66%	2.52%	0.86%	12
Retention Rates	86.67%	84.13%	-2.54%	28
FT UG Enrollment	5,552	6,932	24.86%	9
Financial				
Wealth	257,877	495,758	92.25%	29
Net T&F	8,345	18,572	122.6%	6
T&F	18,451	31,592	71.2%	11
Recipient Net T&F	7,913	16,271	8,358	9
Institutional Grant				
% Recipients	95.90%	84.98%	-10.92%	30
Recipient Discount Rate	57.11%	48.50%	-8.62%	17
Freshmen Discount Rate	54.77%	41.21%	-13.56%	24

St. Olaf College, located in Northfield, Minnesota, had a high change in *freshmen discount rate,* experienced a large decline in *acceptance rate* and a large increase in *admission yield.* These changes combined to give it the 2nd largest increase in *admission yield.* It also had large improvements in the 75th percentile ACT scores and completion rates. The college had a large increase in *tuition and fees*, 81%, which was the third highest change among the study population. St. Olaf also experienced the 3rd largest increase in *freshmen grant recipient discount rate*. Finally, St. Olaf was aggressive in setting its tuition price, with an average annual change exceeding 8%.

Profile	of St.	Olaf	College

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	12.90%	19.14%	6.24%	14
Socioeconomic	13.34%	16.22%	2.88%	16
Enrollment				
Acceptance rate	76.85%	55.82%	-21.03%	5
Yield	39.49%	34.99%	-4.50%	7
Admission Index	51.39%	62.69%	11.30%	2
75th % ACT	29.68	31.31	5.49%	5
Completion Rate	76.62%	86.41%	9.79%	4
Fr. Enrollment Change	-0.43%	-2.75%	-2.32%	24
Retention Rates	92.67%	93.55%	0.88%	15
FT UG Enrollment	2,855	3,073	7.64%	22
Financial				
Wealth	117,255	374,749	219.60%	9
Net T&F	13,113	20,086	53.2%	20
T&F	19,630	35,550	81.1%	3
Recipient Net T&F	11,897	17,056	5,159	23
Institutional Grant				
% Recipients	84.28%	83.61%	-0.67%	28
Recipient Discount Rate	39.39%	52.02%	12.63%	3
Freshmen Discount Rate	33.20%	43.50%	10.30%	6

The University of Findlay, located in Findlay, Ohio, had the highest change in *freshmen discount rate* and the second highest change in *freshmen grant recipient discount rate*. It also maintained a high level for *percentage of freshmen grant recipients*. These changes helped Findlay to have low increases in *net tuition and fees* and *recipient net tuition and fees*. Findlay experienced numerous positive changes in its enrollment profile. Most notably, the university experienced a large increase in *average 75th percentile ACT score* and *freshmen to sophomore retention rates*. Findlay also experienced large increases in *admission yield, admission index* and *institutional wealth*. Finally, Findlay had the third largest decline in *racial and ethnic diversity*.

Table 24

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	22.01%	17.84%	-4.17%	28
Socioeconomic	31.77%	32.63%	0.86%	20
Enrollment				
Acceptance rate	81.97%	69.42%	-12.55%	9
Yield	31.94%	31.46%	-0.48%	3
Admission Index	38.97%	45.32%	6.35%	4
75th % ACT	24.28	26.31	8.36%	1
Completion Rate	52.54%	56.05%	3.51%	22
Fr. Enrollment Change	2.28%	-1.18%	-3.46%	26
Retention Rates	62.33%	75.17%	12.84%	1
FT UG Enrollment	2,615	2,636	0.80%	25
Financial				
Wealth	29,846	106,588	257.13%	4
Net T&F	10,459	11,679	11.7%	30

Profile of The University of Findlay

T&F	16,049	25,772	60.6%	20	
Recipient Net T&F	9,481	11,552	2,071	29	
Institutional Grant					
% Recipients	85.11%	99.11%	14.00%	12	
Recipient Discount Rate	40.92%	55.18%	14.25%	2	
Freshmen Discount Rate	34.83%	54.68%	19.85%	1	

The University of Chicago, located in Chicago, Illinois, had a low change in *freshmen discount rate* and experienced the largest increase in *racial and ethnic diversity*. In period B, the University of Chicago had the largest percentage of non-white students in its freshmen class, exceeding 55%. Chicago also experienced large improvements in enrollment variables. Its *acceptance rate* dropped 21.58% and *admission yield* increased by 5.33% resulting in an *admission index* that rose by nearly 112%. It boasted the second largest drop in *acceptance rate*, the largest gain in *admission yield*, and the largest improvement in *admission index*. The university had a large improvement in *completion rates* and the best *freshmen to sophomore retention rates*, for the recent period, over 98%. Chicago increased *full-time undergraduate headcount* by over 39%. It was the most expensive institution, but despite this fact, it had a low *percentage of freshmen grant recipients* and it was able to have large increases in *recipient net tuition and fees* and *net tuition and fees*.

Table 25

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	33.77%	55.37%	21.60%	1
Socioeconomic	12.55%	16.09%	3.54%	15

Profile of University of Chicago

Enrollment

Acceptance rate	41.49%	19.91%	-21.58%	4
Yield	32.64%	37.97%	5.33%	1
Admission Index	78.67%	190.65%	142.25%	1
75th % ACT	34.40	35.55	3.34%	19
Completion Rate	83.40%	92.10%	8.70%	8
Fr. Enrollment Change	2.08%	2.64%	0.56%	14
Retention Rates	95.67%	98.36%	2.69%	9
FT UG Enrollment	3,732	5,195	39.20%	6
Financial				
Wealth	1,253,224	3,290,049	162.53%	17
Net T&F	11,306	24,120	113.3%	7
T&F	25,199	40,009	58.8%	23
Recipient Net T&F	604	13,271	12,667	6
Institutional Grant				
% Recipients	56.49%	59.42%	2.93%	27
Recipient Discount Rate	97.60%	66.83%	-30.77%	23
Freshmen Discount Rate	55.13%	39.71%	-15.42%	25

The University of Dayton, located in Dayton, Ohio had a medium change in *freshmen discount rate* and experienced average changes in its profile. It held its *freshmen grant recipient discount rate* and *freshmen discount rate* steady and near the study population mean. This university experienced large changes in *tuition and fees* and in *freshmen enrollment changes*.

Table 26

Profile of University of Dayton

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	9.84%	14.19%	4.35%	20
Socioeconomic	14.67%	14.08%	-0.59%	23

Enrollment				
Acceptance rate	81.92%	75.26%	-6.66%	17
Yield	28.63%	21.37%	-7.26%	11
Admission Index	34.94%	28.40%	-6.54%	15
75th % ACT	27.00	28.00	3.70%	11
Completion Rate	70.99%	76.26%	5.27%	20
Fr. Enrollment Change	-1.44%	0.48%	1.92%	9
Retention Rates	86.50%	86.83%	0.33%	19
FT UG Enrollment	6,297	7,090	12.59%	17
Financial				
Wealth	117,424	308,062	162.35%	18
Net T&F	9,859	16,728	69.7%	12
T&F	15,972	28,659	79.4%	5
Recipient Net T&F	8,947	16,463	7,516	12
Institutional Grant				
% Recipients	87.02%	97.83%	10.81%	14
Recipient Discount Rate	43.98%	42.56%	-1.43%	11
Freshmen Discount Rate	38.27%	41.63%	3.36%	12

The University of Northwestern Ohio, located in Lima, Ohio, had a medium change in *freshmen discount rate* and experienced rapid enrollment growth during the study period, with the *total full-time undergraduate headcount* increasing by over 245%. It also experienced a rapid decline in *racial and ethnic diversity* and *socioeconomic diversity*, ranking as the institution with the greatest and 2nd greatest declines, respectively. This institution experienced the largest gains in *freshmen-to-sophomore retention rates* and *completion rates*. It had the lowest level of *institutional wealth*, the lowest average *tuition and fees* and the lowest *freshmen discount rate* (under 4%) in both periods. Unlike most of the institutions in this study, the University of Northwestern used a low-tuition, low-aid strategy.

Table 27

Profile of University of Northwestern Ohio

Profile of University of Northwestern Onto						
Variable	Period A	Period B	Change	Relative Rank		
Diversity						
Racial and Ethnic	78.72%	42.24%	-36.48%	30		
Socioeconomic	59.77%	47.77%	-12.00%	29		
Enrollment						
Completion Rate	45.03%	59.54%	14.51%	1		
Fr. Enrollment Change	17.15%	7.03%	-10.12%	28		
Retention Rates	52.67%	64.29%	11.62%	2		
FT UG Enrollment	1,048	3,624	245.80%	1		
Financial						
Wealth	13,867	36,067	160.09%	19		
Net T&F	10,407	12,980	24.7%	29		
T&F	10,825	13,445	24.2%	30		
Recipient Net T&F	3,360	10,583	7,223	14		
Institutional Grant						
% Recipients	5.60%	16.25%	10.65%	15		
Recipient Discount Rate	68.96%	21.29%	-47.67%	26		
Freshmen Discount Rate	3.86%	3.46%	-0.40%	18		

The University of Notre Dame, located in South Bend, Indiana was in the low change category with a decrease in *freshmen discount rate* of nearly 23%. Notre Dame experienced modest gains in diversity and enrollment measures. It also had slow growth in *total full-time undergraduate headcount*. Notre Dame had one of the largest decreases in *freshmen grant recipient discount rate* and a small increase in the *percentage of freshmen grant recipients*.

Also, Notre Dame had the fifth highest *tuition and fees* in period B. These changes combined to give it the third largest increase in *recipient net tuition and fees* and the greatest increase to *net tuition and fees*, nearly \$15,000. Increases in tuition revenues helped this university achieve the largest percentile gain in *institutional wealth*, nearly tripling its value over the period of this study.

Table 28

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	19.16%	26.73%	7.57%	11
Socioeconomic	15.66%	18.13%	2.47%	17
Enrollment				
Acceptance rate	32.66%	27.10%	-5.56%	18
Yield	58.61%	49.94%	-8.67%	16
Admission Index	179.45%	184.30%	4.85%	6
75th % ACT	33.46	34.66	3.59%	14
Completion Rate	94.04%	95.93%	1.89%	28
Fr. Enrollment Change	1.66%	0.34%	-1.32%	21
Retention Rates	97.00%	97.53%	0.53%	17
FT UG Enrollment	7,874	8,395	6.62%	23
Financial				
Wealth	509,227	1,925,925	278.21%	2
Net T&F	9,281	24,093	159.6%	1
T&F	23,300	38,433	64.9%	17
Recipient Net T&F	(5,357)	12,366	17,723	3
Institutional Grant				
% Recipients	48.92%	55.01%	6.09%	22
Recipient Discount Rate	122.99%	67.82%	-55.17%	28
Freshmen Discount Rate	60.17%	37.31%	-22.86%	28

Profile of University of Notre Dame

The University of St. Thomas, located in St. Paul, Minnesota, had a high change in *freshmen discount rate* and experienced average changes in diversity, enrollment, and financial variables. It was one of only six institutions that experienced an increase in *acceptance rate*. This university also experienced large changes in *freshmen grant recipient discount rate* and had small increases in *recipient net tuition and fees* and *net tuition and fees*.

Table 29

Profile of University of St. Thomas				
Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	10.28%	15.07%	4.79%	18
Socioeconomic	14.66%	18.39%	3.73%	14
Enrollment				
Acceptance rate	84.97%	85.34%	0.37%	25
Yield	40.40%	31.85%	-8.55%	15
Admission Index	47.55%	37.32%	-10.23%	23
75th % ACT	27.00	28.00	3.70%	12
Completion Rate	67.95%	73.68%	5.73%	19
Fr. Enrollment Change	1.12%	0.65%	-0.47%	17
Retention Rates	87.00%	87.35%	0.35%	18
FT UG Enrollment	4,447	5,850	31.55%	7
Financial				
Wealth	126,871	350,546	176.30%	13
Net T&F	11,792	16,260	37.9%	26
T&F	17,371	29,321	68.8%	13
Recipient Net T&F	11,462	15,938	4,476	26
Institutional Grant				
% Recipients	94.42%	97.59%	3.17%	26
1				-

Profile of University of St. Thomas

Recipient Discount Rate	34.02%	45.64%	11.63%	4
Freshmen Discount Rate	32.12%	44.54%	12.43%	3

Valparaiso University located in Valparaiso, Indiana, had a medium change in *freshmen discount rate.* Valparaiso experienced large increases in diversity and experienced the largest increase in *acceptance rate.* It also had the second worst change in *freshmen to sophomore retention rates* and the smallest improvement for *total full-time undergraduate headcount.* In period B, Valparaiso was among the top five institutions for average *freshmen discount rates* and these rates remained steady over the period of the study. Despite a small decline in *total full-time undergraduate headcount* and large discount rates, Valparaiso experienced a large increase in *institutional wealth.*

Table 30

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	10.46%	20.23%	9.77%	8
Socioeconomic	13.64%	27.74%	14.10%	2
Enrollment				
Acceptance rate	62.29%	81.52%	19.23%	30
Yield	34.32%	21.32%	-13.00%	26
Admission Index	55.09%	26.16%	-28.93%	28
75th % ACT	29.00	29.00	0.00%	26
Completion Rate	70.66%	73.71%	3.05%	23
Fr. Enrollment Change	-2.59%	2.09%	4.68%	4
Retention Rates	85.00%	81.81%	-3.19%	29
FT UG Enrollment	2,690	2,687	-0.11%	27
Financial				
Wealth	101,400	368,311	263.23%	3

Profile of Valparaiso University

Net T&F	8,882	13,766	55.0%	19	
T&F	17,685	28,307	60.1%	21	
Recipient Net T&F	8,013	13,366	5,353	22	
Institutional Grant					
% Recipients	91.01%	97.33%	6.32%	21	
Recipient Discount Rate	54.69%	52.78%	-1.91%	12	
Freshmen Discount Rate	49.78%	51.37%	1.59%	15	

Washington University, St. Louis, located in suburban St. Louis, Missouri, was among the low change discount rate group of institutions. In fact, it had the largest decrease in *freshmen discount rate*, a decline of 27.21%. This institution experienced a large change to its *admission yield* and *admission index* and large declines in institutional grant measures. Washington consistently had the lowest *acceptance rate* in the study population and it experienced the second largest increase in *admission yield* over the span of this study. It also reduced the *percentage of freshmen grant recipients* by over 7% and reduced the *freshmen grant recipient discount rate* by nearly 40%. As a result, *recipient net tuition and fees* increased by over \$15,000 and *net tuition and fees* by over \$16,000.

- J				
Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	34.13%	43.33%	9.20%	9
Socioeconomic	10.69%	9.80%	-0.89%	24
Enrollment				
Acceptance rate	22.33%	19.77%	-2.56%	24
Yield	29.24%	30.54%	1.30%	2
Admission Index	130.94%	154.47%	23.53%	3
75th % ACT	33.94	35.10	3.42%	18

Profile of Washington University St. Louis

Completion Rate	86.03%	93.66%	7.63%	13
Fr. Enrollment Change	-4.74%	1.69%	6.43%	3
Retention Rates	96.67%	96.96%	0.29%	20
FT UG Enrollment	5,408	6,224	15.09%	13
Financial				
Wealth	1,041,659	2,742,394	163.27%	16
Net T&F	10,443	26,880	157.4%	2
T&F	24,879	38,853	56.2%	27
Recipient Net T&F	46	15,423	15,377	5
Institutional Grant				
% Recipients	58.13%	51.10%	-7.03%	29
Recipient Discount Rate	99.82%	60.30%	-39.51%	24
Freshmen Discount Rate	58.02%	30.82%	-27.21%	30

Xavier University, located in Cincinnati, Ohio, had a medium change in *freshmen discount rate* and experienced the second largest increase in *freshmen enrollment changes*. Xavier experienced large decreases in 75th percentile ACT test scores and freshmen to sophomore retention rates. This institution tied for the third lowest admission yield in period B.

D.

Table 32

Variable	Period A	Period B	Change	Relative Rank
Diversity				
Racial and Ethnic	11.42%	17.29%	5.87%	16
Socioeconomic	11.64%	17.95%	6.31%	10
Enrollment				
Acceptance rate	81.52%	70.65%	-10.87%	11
Yield	25.53%	17.90%	-7.63%	12
Admission Index	31.32%	25.34%	-5.98%	17

Profile of Xavier University

28.50	27.66	-2.95%	28	
70.19%	78.44%	8.25%	10	
-0.34%	10.72%	11.06%	2	
89.50%	84.48%	-5.02%	30	
3,139	3,848	22.59%	10	
99,214	277,680	179.88%	12	
9,226	14,908	61.6%	17	
15,998	28,566	78.6%	6	
7,822	14,664	6,842	15	
82.83%	98.25%	15.42%	8	
51.11%	48.67%	-2.44%	13	
42.33%	47.81%	5.48%	11	
	28.50 70.19% -0.34% 89.50% 3,139 99,214 9,226 15,998 7,822 82.83% 51.11% 42.33%	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	28.50 27.66 $-2.95%$ $70.19%$ $78.44%$ $8.25%$ $-0.34%$ $10.72%$ $11.06%$ $89.50%$ $84.48%$ $-5.02%$ $3,139$ $3,848$ $22.59%$ $99,214$ $277,680$ $179.88%$ $9,226$ $14,908$ $61.6%$ $15,998$ $28,566$ $78.6%$ $7,822$ $14,664$ $6,842$ $82.83%$ $98.25%$ $15.42%$ $51.11%$ $48.67%$ $-2.44%$ $42.33%$ $47.81%$ $5.48%$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

Composite Profile

Overall, the study population experienced improvements in diversity, enrollment and financial measures. On average, these 30 institutions awarded less money per student but did so to greater numbers of students. The wide range of changes in institutional grant, diversity, enrollment and financial variables between period A and period B may reflect variations in the condition of each of these institutions and their funding strategies. More detailed study of these trends is found in the following analysis of the variables.

Profile of Study Population			
Variable	Period A	Period B	Change
Diversity			
Racial and Ethnic	21.24%	26.58%	5.34%
Socioeconomic	20.95%	23.26%	2.32%
Enrollment			

Acceptance rate	71.18%	63.88%	-7.30%
Yield	35.84%	28.41%	-7.44%
Admission Index	58.21%	57.47%	-0.73%
75th % ACT	28.63	29.61	3.42%
Completion Rate	68.14%	73.97%	5.83%
Fr. Enrollment Change	0.99%	0.84%	-0.15%
Retention Rates	84.40%	86.30%	1.90%
FT UG Enrollment	3,994	4,998	25.15%
Financial			
Wealth	217,675	576,772	164.97%
Net T&F	9,836	17,170	74.6%
T&F	17,502	25,772	47.3%
Recipient Net T&F	6,063	14,581	8,518
Institutional Grant			
% Recipients	72.10%	82.81%	10.70%
Recipient Discount Rate	61.18%	48.78%	-12.40%
Freshmen Discount Rate	41.56%	40.07%	-1.49%

Analysis of Variables

Institutional Grant Variables

Distributions.

The mean change in *percentage of freshmen grant recipients* from period A to period B was 10.7% with a range of changes of -10.9% to 35.7%. The mean change in *freshmen grant recipient discount rates* was -12.4% with a range of -71.5% to 16.5%. In the most recent period, the *freshmen grant recipient discount rate* ranged from 21.3% to 67.8%. These wide ranges indicate the breadth and depth of changes to institutional grant strategies over the study period. On average, the institutions of this study have consistently provided *freshmen discount rates* of just over 40%, but there are wide variations between institutions.

The mean change in *freshmen discount rate* was 1.5% with changes ranging from -27.2% to 19.9%. In period B, the *freshmen discount rate* ranged from 3.5% to 54.7%.

Table 34

Period	Minimum	Maximum	Median	Mean	Std. Deviation
		Percentage of	of freshmen gran	nt recipients	
Period A	5.6%	95.9%	81.8%	72.1%	23.4%
Period B	16.3%	99.1%	92.9%	82.8%	21.8%
Change	-10.9%	35.7%	10.6%	10.7%	9.4%
	Freshmen Grant Recipient Discount Rate				
Period A	26.6%	135.0%	54.1%	61.2%	28.0%
Period B	21.3%	67.8%	48.4%	48.8%	9.8%
Change	-71.5%	16.5%	-7.0%	-12.4%	23.4%
		Fresl	nmen Discount	Rate	
Period A	3.9%	60.2%	41.1%	41.6%	13.1%
Period B	3.5%	54.7%	41.1%	40.1%	11.2%
Change	-27.2%	19.9%	1.4%	-1.5%	12.9%

Distribution of Institutional Grant Variables, by Period

Table 35 displays the distribution of institutional grant variables by institutional category for period A. The high change institutions had the largest average *percentage of freshmen grant recipients*, lowest average *recipient discount rate*, and lowest average *freshmen discount rate* in period A. The medium change institutions had the middle average values for each variable. Finally, the low change institutions had the lowest average *percentage of freshmen grant recipients* and the highest average *recipient discount rate* and *freshmen discount rate*.

The overall range of values in period A indicated a variety of strategies. The *percentage of freshmen grant recipients* had a range from 5.6% to 95.9%. The *recipient*

discount rate had a range of 26.7% to 135.0% and the freshmen discount rate had a range of

3.9% to 60.2%.

Table 35

Category	Minimum	Maximum	Median	Mean	Std. Deviation
		Percentage of	f Freshmen Grant	Recipients	
High Change	59.4%	94.4%	86.8%	84.1%	11.0%
Medium Change	5.6%	93.2%	79.0%	72.3%	25.2%
Low Change	6.7%	95.9%	57.3%	59.9%	26.1%
-	Recipient Discount Rate				
High Change	26.7%	51.2%	38.7%	38.9%	6.8%
Medium Change	44.0%	69.0%	55.1%	55.3%	6.4%
Low Change	54.1%	135.0%	99.8%	92.4%	29.7%
-	Freshmen Discount Rate				
High Change	19.0%	46.9%	32.7%	32.8%	7.2%
Medium Change	3.9%	49.8%	41.1%	38.8%	13.0%
Low Change	29.0%	60.2%	55.9%	53.1%	9.5%

Distribution of Institutional Grant Variables by Institutional Category, period A

Table 36 displays the distribution of institutional grant variables by institutional category for period B. Like in period A, the high change institutions continued to provide the greatest average *percentage of freshmen grant recipients*. These institutions also made substantial investments in *recipient discount rate* and as a result this category jumped from the lowest ranked to the second ranked category for this variable. This also resulted in the high change institutions having the highest average *freshmen discount rate* in period B.

The medium and low change categories also increased the *percentage of freshmen grant recipients*. The near uniform increases in *percentage of freshmen grant recipients* across all change categories indicated increased competition for students during the study period. The low change category maintained the highest average *recipient discount rate*, but the medium and low category institutions had an average reduction in *recipient discount* *rates* from period A to period B. Despite this reduction, *freshmen discount rate* increased due to the simultaneous increase in *percentage of freshmen grant recipients*. Essentially, the medium and low category institutions gave a higher amount of institutional grants to a larger pool of freshmen.

Like in period A, large ranges in values continued to exist in period B. *Percentage of freshmen grant recipients* had a range of 16.3% to 99.1%. *Recipient discount rate* had a range of 21.3% to 67.8%. *Freshmen discount rate* had a range of 3.5% to 54.7%. Institutions continued to use a variety of institutional grant strategies in period B.

Table 36

Distribution of Institutional Grant Variables by Institutional Category, period B

2 1511 10 111011 0/ 111511				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Category	Minimum	Maximum	Median	Mean	Std. Deviation
	Percentage of Freshmen Grant Recipients				
High Change	83.6%	99.1%	97.2%	94.7%	6.0%
Medium Change	16.3%	98.4%	94.9%	85.6%	25.0%
Low Change	30.6%	97.5%	67.9%	68.2%	21.8%
_	Recipient Discount Rate				
High Change	34.8%	56.6%	46.0%	46.8%	7.5%
Medium Change	21.3%	52.8%	46.1%	44.2%	8.9%
Low Change	42.5%	67.8%	60.3%	56.0%	9.8%
_	Freshmen Discount Rate				
High Change	29.1%	54.7%	44.0%	44.4%	8.1%
Medium Change	3.5%	51.4%	40.6%	39.7%	13.7%
Low Change	9.4%	46.7%	39.4%	36.1%	10.5%

Table 37 displays the distribution of changes to institutional grant variables by institutional category. The high change institutions experienced a mean increase in *freshmen discount rates* of 11.6% with a range of 7.3% to 19.9%. The medium change institutions experienced a mean increase in *freshmen discount rate* of 0.9% with a range of -4.9% to
5.5%. The low change institutions had a mean change in freshmen discount rates of -17.0% with a range of -27.2% to -5.3%.

The high change institutions had a mean change in the *percentage of freshmen grant* recipients of 10.5% and a range of -0.7% to 35.7%. The medium change institutions had a mean change of 13.3% and a range of 5.1% to 22.2%. The low change institutions had a mean change of 7.1% and a range of -10.9% to 24.3%. Each institutional category experienced an increase in the average percentage of freshmen grant recipients from period A to period B and the medium change institutions experienced the greatest change.

The high change institutions experienced an average increase in *freshmen grant* recipient discount rates of 7.9% with a range of -4.3% to 16.5%. The medium change institutions experienced an average change of -11.1% with a range of -47.7% to -0.9%. The low change institutions experienced an average change of -36.4% with a range of -71.5% to -8.6%. Only nine of the 30 institutions of the study increased the *freshmen grant recipient* discount rate. Generally, over the course of the study there was a trend to increase the number of students who received grants and to reduce the discount rate for those recipients. Table 37

Category	Minimum	Maximum	Median	Mean	Std. Deviation	
_	Percentage of Freshmen Grant Recipients					
High Change	-0.7%	35.7%	8.9%	10.5%	10.2%	
Medium Change	5.1%	22.2%	14.8%	13.3%	5.1%	
Low Change	-10.9%	24.3%	7.1%	8.3%	11.9%	
_		Recip	ient Discount	Rate		
High Change	-4.3%	16.5%	8.0%	7.9%	6.3%	
Medium Change	-47.7%	-0.9%	-7.8%	-11.1%	14.0%	
Low Change	-71.5%	-8.6%	-39.5%	-36.4%	22.2%	
_	Freshmen Discount Rate					
High Change	7.3%	19.9%	10.8%	11.6%	4.2%	

Distribution of Institutional Grant Variables by Institutional Category, Change from Period A to Period B

Medium Change	-4.9%	5.5%	1.4%	0.9%	2.8%
Low Change	-27.2%	-5.3%	-17.2%	-17.0%	6.9%

Correlations and partial correlations.

Table 38 lists the correlation coefficients between each institutional grant variable for each time period. Large significant correlations were found between the *average institutional grant for the freshmen class, average institutional grant per freshmen grant recipient*, and the *recipient discount rate* (REC_DR%) and *freshmen discount rates* (FR_DR%). Therefore, the *average institutional grant for the freshmen class* and *average institutional grant per freshmen grant recipient* variables were removed and no further analysis was conducted. The *freshmen grant recipient discount rate* and *freshmen discount rates* had a large association in both periods A and B. In period A, the *percentage of freshmen grant recipients* had a large negative association with *freshmen grant recipient discount rate*. Essentially, a greater number of recipients was associated with a lower recipient discount rate. In period B, the *freshmen discount rate* had a medium association with the *freshmen grant recipients*.

Table 38

Correlations Detween Insti	iuiionai Grani variables, by reriba		
Variable	%_REC	REC_DR%	
	Per	riod A	
REC_DR%	64**	-	
FR_DR%	.20	.66**	
	Per	riod B	
REC_DR%	-0.08	-	
FR_DR%	0.84**	0.49**	
	Change from Pe	eriod A to Period B	
REC_DR%	-0.09	-	
FR_DR%	0.13	0.87**	
** 0 1.0	$(1, 1, 1) = 0, 0, 1, 1, \dots, 1, (2, 1, 1)$		

Correlations Between Institutional Grant Variables, by Period

**. Correlation is significant at the 0.01 level (2-tailed).

Table 39 displays the correlation coefficients between each institutional grant variable by the institutional category and time period. The high change institutions had a large association between the *percentage of freshmen grant recipients* and the *freshmen discount rate* in period A and this association weakened by period B. These institutions also had a large association between the *freshmen grant recipient discount rate* and the *freshmen discount rate* in both periods A and B. These institutions practiced a high tuition, high aid strategy in both time periods of this study and became even more generous recently.

The medium change institutions had a large negative association between the *percentage of freshmen grant recipients* and the *freshmen grant recipient discount rate* in period A but by period B this association changed to a large positive association. Essentially, over the decade of this study, these institutions distributed increasingly larger grants to greater numbers of students. Also, the medium change institutions had a large association between the recipient and *freshmen discount rates* in periods A and B.

The low change institutions had a large negative association between the *percentage* of freshmen grant recipients and the freshmen grant recipient discount rate in both periods A and B which indicates a consistently small group of recipients received available grant funds. These institutions also had a large association between the freshmen discount rate and the *percentage of freshmen grant recipients* which is an indication new grant recipients received similar amounts of grant funds as existing recipients.

Correlations Between Institutional Grant Variables by Institutional Category and Period

	%_REC			REC_DR%		
Variable	High	Medium	Low	High	Medium	Low
	Period A					
REC_DR%	.02	84**	98**	-	-	-

FR_DR%	.77**	68*	.79*	.65*	.97**	.41
			Perio	od B		
REC_DR%	.25	.91**	90**	-	-	-
FR_DR%	.55	.97**	.80**	.95**	.98**	35
		Ch	ange from Peri	od A to Period	В	
REC_DR%	.74*	16	46	-	-	-
FR DR%	.08	35	.05	.59	.48	.77*

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

When the variable of *total full-time undergraduate headcount* was controlled, the population of institutions had a large negative association between the *percentage of freshmen grant recipients* and *freshmen grant recipient discount rates* in period A (see Table 40). Fewer recipients meant higher average grants for each recipient. In period B, there was a large positive association between the *freshmen discount rate* and *percentage of freshmen grant recipients* and between the *freshmen discount rate* and *percentage of freshmen discount rates*. This shift in associations over the 10-year period indicated the population of institutions simultaneously increased the proportion of the student body receiving grants and the amount of grant provided to each student.

Table 40

Variable	%_REC	REC_DR%		
	Perio	od A		
REC_DR%	66**	-		
FR_DR%	.19	.58**		
	Period B			
REC_DR%	.04	-		
FR DR%	.78**	.55**		
	Change from Period A to Period B			
REC DR%	10	-		
FR_DR%	.21	.89**		

Partial Correlations Between Institutional Grant Variables Controlling for Full-Time Undergraduate Headcount, by Period

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

When controlling the *institutional wealth* variable (Table 41), the population of institutions had a medium association between the *percentage of freshmen grant recipients* and the *freshmen grant recipient discount rate* in period A. This association was much larger in period B which indicated an increase in the *percentage of freshmen grant recipients* as well as the amount of aid to each recipient irrespective of wealth. Also, there was a large negative association between the *percentage of freshmen grant recipients* and the *freshmen grant recipients*.

When controlling the variable of *institutional wealth*, the population of institutions had a large negative association between *freshmen grant recipient discount rate* and *freshmen discount rate*. Also, the change in *freshmen discount rate* had a large association with the change in *freshmen grant recipient discount rate*. When grant funds were distributed across a larger proportion of the freshmen class, less grant funds were given to each individual recipient.

Table 41

Variable	%_REC	REC_DR%			
	Period	A			
REC_DR%	.39*	-			
FR_DR%	55**	94**			
	Period B				
REC_DR%	.88**	-			
FR_DR%	76**	86**			
	Change from Period	A to Period B			
REC_DR%	10	-			
FR_DR%	.19	.88**			

Partial Correlations Between Institutional Grant Variables Controlling for Full-Time Undergraduate Headcount, by Institutional Category and Period

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Diversity Variables

Distributions.

Table 42 displays the distribution of diversity variables by period. The mean change in *racial and ethnic diversity* from period A to period B was 6.0%. The range of change was -36.5% to 21.6%. The mean *racial and ethnic diversity* percentage in period B was 22.1% and the range was 10.6% to 55.4%. The mean *socioeconomic diversity* percentage change was 3.2% and the range was -36.9% to 17.3%. The mean *socioeconomic diversity* percentage in period B was 21.6% and the range was 9.8% to 47.8%.

Table 42

Distribution of Diversity Variables, by Period

Period	Minimum	Maximum	Median	Mean	Std. Deviation	
	Racial and Ethnic Diversity					
Period A	3.4%	78.7%	14.9%	21.2%	15.9%	
Period B	10.6%	55.4%	22.1%	26.6%	12.5%	
Change	-36.5%	21.6%	6.0%	5.3%	10.0%	
	Socioeconomic Diversity					
Period A	10.3%	59.8%	16.6%	20.9%	12.2%	
Period B	9.8%	47.8%	21.6%	23.3%	8.9%	
Change	-36.9%	17.3%	3.2%	2.3%	9.7%	

Table 43 displays the distribution of diversity variables by institutional category for period A. The high change institutions had a mean *racial and ethnic diversity* of 10.8% with a range of 3.4% to 22.0%. The medium change institutions had a mean *racial and ethnic diversity* of 21.5% with a wide range of 7.1% to 78.7%. At 31.4%, the low change institutions had the highest mean percentage of *racial and ethnic diversity* and this category also had a narrow range from 19.2% to 46.3%. Across the change categories, the mean

socioeconomic diversity was similar. The mean *socioeconomic diversity* was 22.4%, 20.2%, and 20.3% respectively for the high, medium, and low change categories.

Table 43

Distribution of Diversity Furtuates by Institutional Calegory, Fertouri						
Category	Minimum	Maximum	Median	Mean	Std. Deviation	
_	Racial and Ethnic Diversity					
High Change	3.4%	22.0%	10.4%	10.8%	5.5%	
Medium Change	7.1%	78.7%	14.0%	21.5%	21.8%	
Low Change	19.2%	46.3%	32.2%	31.4%	8.8%	
-	Socioeconomic Diversity					
High Change	13.3%	56.4%	16.8%	22.4%	13.2%	
Medium Change	11.3%	59.8%	14.3%	20.2%	14.8%	
Low Change	10.3%	35.9%	18.2%	20.3%	9.2%	

Distribution of Diversity Variables by Institutional Category, Period A

Table 44 contains the distribution of diversity variables by institutional category for period B. The mean *racial and ethnic diversity* increased to 18.0%, 22.8%, and 38.9% for the high, medium, and low categories. Across all institutions, the range of *racial and ethnic diversity* became smaller, 10.6% to 55.4% in period B versus 3.4% to 78.7% in period A. The mean *socioeconomic diversity* increased to 24.5%, 24.7%, and 20.5%, respectively, for the high, medium, and low categories.

Distribution of Diversity Variables by Institutional Category, Period B

Category	Minimum	Maximum	Median	Mean	Std. Deviation	
High Change	10.6%	31.9%	17.7%	18.0%	6.4%	
Medium Change	13.2%	42.2%	18.9%	22.8%	10.5%	
Low Change	26.7%	55.4%	39.7%	38.9%	9.2%	
_	Socioeconomic Diversity					
High Change	16.2%	32.6%	24.8%	24.5%	5.6%	
Medium Change	14.1%	47.8%	19.3%	24.7%	11.1%	
Low Change	9.8%	34.7%	18.2%	20.5%	9.4%	

Table 45 displays the change in the distribution of diversity variables by institutional change category from period A to period B. The institutions with the lowest average change in *freshmen discount rate* experienced the highest average change in *racial and ethnic diversity*, 7.2%. The institutions with medium changes to *freshmen discount rates* experienced the highest increase to *socioeconomic diversity*, 4.5%. Across all categories, the range of values for both diversity variables became larger. Minimum percentages declined and maximum percentages increased, which indicated a variety of discount strategies related to changes in diversity.

Table 45

Distribution of Diversity Variables by Institutional Category, Change from Period A to Period B

Category	Minimum	Maximum	Median	Mean	Std. Deviation		
	Racial and Ethnic Diversity						
High Change	-4.2%	18.4%	7.1%	7.2%	5.8%		
Medium Change	-36.5%	11.1%	4.1%	1.3%	13.6%		
Low Change	-5.7%	21.6%	6.5%	7.5%	8.9%		
	Socioeconomic Diversity						
High Change	-36.9%	13.9%	5.9%	2.1%	14.4%		
Medium Change	-12.0%	17.3%	5.5%	4.5%	8.2%		
Low Change	-8.8%	8.0%	1.2%	0.3%	4.6%		

Correlations and partial correlations.

Table 46 displays the correlations between institutional grant and diversity variables by period. In periods A and B there was a large negative association between the *percentage of freshmen grant recipients* and *racial and ethnic diversity*. In period A the *freshmen discount rate* did not have a significant association with *racial and ethnic diversity* and in period B there was a medium negative association. In period A, the *freshmen discount rate* had a large negative association with *socioeconomic diversity* and no significant association in period B. Essentially, when institutional grant funds were given to a higher proportion of

the freshmen class, diversity declined. Also, larger grants to recipients was not consistently associated with increased diversity.

Table 46

Variable % REC REC DR% FR DR% Period A .48** -.75** Racial and Ethnic Diversity -.11 -.57** Socioeconomic Diversity -.40* -.16 Period B Racial and Ethnic Diversity -.68** .33 -.45* Socioeconomic Diversity -.14 -.43* -.24 Change from Period A to Period B -.02 -.06 Racial and Ethnic Diversity .13 Socioeconomic Diversity .03 .20 .12

Correlations Between Institutional Grant and Diversity Variables, by Period

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 47 displays correlation coefficients between institutional grants and diversity variables by institutional category and period. The findings displayed in the previous table are not consistent across groups of institutions. The high change institutions had only one significant association, that is *percentage of freshmen grant recipients* and *socioeconomic* diversity in period B. Generally, the high change in freshmen discount rate was not associated with increased diversity for this category.

The associations for the medium change category mostly mirrored the entire population. These institutions had large negative associations between the *percentage of* freshmen grant recipients and racial and ethnic diversity in periods A and B. Further, these institutions had large negative associations between *freshmen discount rate* and diversity variables in period A and B. The medium change institutions experienced large, positive associations between the *freshmen grant recipient discount rate* and diversity variables in period A. Although not significant, these associations became negative by period B.

The low change institutions had a large negative association between *freshmen* discount rate and racial and ethnic diversity in period A but this association dissipated by period B. Finally, the medium change institutions had a large, positive association between the change in *freshmen grant recipient discount rate* and the change in *racial and ethnic* diversity which indicated the increase in freshmen discount rates was associated with an increase in *racial and ethnic diversity* for this category of institutions. With this exception noted, the variety of changes to institutional grant variables was not associated with changes to diversity variables.

Table 47

REC DR% FR DR% % REC Variable Η Μ L Η М L Η Μ L Period A Racial and Ethnic .09 -.91** -.50 .50 .76* .02 .30 -.90** -.70* Diversity Socioeconomic -.37 -.90** -.02 -.54 .75* -.46 -.57 -.90** -.50 Diversity Period B Racial and Ethnic .11 -.74* -.42 .11 -.51 .49 .11 -.65* -.19 Diversity Socioeconomic .68* .26 -.53 .47 -.76* .18 -.46 -.64* -.17 Diversity Change from Period A to Period B Racial and Ethnic .47 .17 -.59 .88** .06 .00 -.26 -.06 -.30 Diversity Socioeconomic -.02 .24 -.21 -.11 .61 .31 .04 .07 .21 Diversity

Correlations Between Institutional Grant and Diversity Variables, by Institutional Category and Period

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 48 displays the partial correlations between institutional grant and diversity variables when controlling for the variable total full-time undergraduate headcount. When controlling the variable of *total full-time undergraduate headcount*, the *percentage of* freshmen grant recipients had a large negative association with racial and ethnic diversity in periods A and B. The institutions with greater percentages of freshmen grant recipients tended to have less *racial and ethnic diversity*. In period A, *freshmen grant recipient discount rate* had a large, positive association with *racial and ethnic diversity* and by period B, this association dissipated. In period A, there was no significant association between *freshmen grant recipient discount rate* and *socioeconomic diversity* and in period B this changed to a medium negative association. In period A, *freshmen discount rate* had a medium negative association with *socioeconomic diversity* and this association did not exist in period B. Controlling the variable of *total full-time undergraduate headcount* made little difference in the findings and in most cases reduced the size of the associations between institutional grant and diversity variables.

Table 48

Time Chack graduate Headebuilt, by Teriba						
Variable	%_REC	REC_DR%	FR_DR%			
	Period A					
Racial and Ethnic Diversity	73**	.50**	10			
Socioeconomic Diversity	45*	00	474*			
Period B						
Racial and Ethnic Diversity	62**	.29	32			
Socioeconomic Diversity	09	42*	19			
Change from Period A to Period B						
Racial and Ethnic Diversity	.01	15	27			
Socioeconomic Diversity	.02	.13	.10			

Partial Correlations Between Institutional Grant and Diversity Variables Controlling for Full-Time Undergraduate Headcount, by Period

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 49 displays the partial correlations between institutional grant and diversity variables when controlling for the variable *institutional wealth*. The large negative correlation between the *percentage of freshmen grant recipients* and diversity variables held true in Period A, although the association is smaller when controlling for *institutional wealth*.

There was a medium negative association between *percentage of freshmen grant recipients* and *socioeconomic diversity* in both periods. Finally, there was also a large negative association between *freshmen discount rate* and *socioeconomic diversity* in period A and this association was not significant in period B. When controlling for *institutional wealth*, the associations between institutional grant and diversity variables were similar to the associations when no variables were controlled and in most cases the size of the correlation coefficients decreased.

Table 49

Partial Correlations Between Institutional Grant and Diversity Variables Controlling for Institutional Wealth, by Period

Variable	%_REC	REC_DR%	FR_DR%					
Period A								
Racial and Ethnic Diversity	70**	.41*	31					
Socioeconomic Diversity	51**	.00	54**					
	Period B							
Racial and Ethnic Diversity	45*	27	36					
Socioeconomic Diversity	43*	16	26					
	Change from Period A to	Period B						
Racial and Ethnic Diversity	.01	.12	13					
Socioeconomic Diversity	00	.18	.07					

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Enrollment Variables

Distributions.

Table 50 displays the distributions of the eight enrollment variables of this study. The institutions of this study experienced mean changes in *acceptance rates* of -7.3% with a range of -23.8% to 19.2%. For the most recent period, the institutions had a mean *acceptance rate* of 63.9% and range of 19.8% to 88.3%. The mean change to *admission yield* was -7.4% and the range of *admission yield* changes was -15.5% to 5.3%. For the most recent period,

the institutions had a mean *admission yield* of 28.4% and a range from 15.3% to 49.9%. The mean change to the *admission index* was -7.2% and the range of *admission index* changes was -52.5% to 142.3%. For the most recent period, the institutions had a mean *admission index* of 0.575 and a range of index scores from 0.252 to 1.907. As a whole, the institutions accepted a lower percentage of applicants, experienced declining yields and had declines in the admission index.

The mean change to the *average 75th percentile ACT score* was 3.5% with a range of changes from -3.0% to 8.4%. In the most recent period, the institutions had a mean 75th *percentile ACT* score of 29.61 and a range from 24.69 to 35.55. The mean change to *completion rates* was 5.8% with a range of -19.2% to 14.5%. In the most recent period, the institutions had mean *completion rates* of 74.0% and a range from 37.4% to 95.9%. On average, the study population enrolled freshmen with higher standardized test scores and graduated a higher percentage of students.

The mean change to *freshmen enrollment increases* was -0.2% with a range of -13.1% to 15.8%. For the most recent period, the institutions had mean *freshmen enrollment increases* of 0.8% and a range of -3.9% to 10.7%. The mean change to *freshmen to sophomore retention rates* was 1.9% with a range of changes from -5.0% to 12.8%. In the most recent period, the institutions experienced a mean *freshman to sophomore retention rate* of 86.3% with a range of 64.3% to 98.4%. The mean change to *total full-time undergraduate headcount* was 27.7% with a range of -12.1% to 245.8%. For the most recent period, the mean *total full-time undergraduate headcount* was 4,998 and the range was 2,459 to 13,272. Although the rate of freshmen enrollment increases declined, there have been consistent changes of near 1.0%. These consistent increases in freshmen enrollment combined with increases to *freshmen to sophomore retention rates* had a large impact on *total full-time undergraduate headcount*. The population of institutions emerged from the time period of this study with improvements to most enrollment variables. The decline in *admission yield* was an indicator of increased competition.

Table 50

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Period	Minimum	Maximum	Median	Mean	Std. Deviation
			Acceptance rat	te	
Period A	22.3%	98.4%	77.5%	71.2%	19.6%
Period B	19.8%	88.3%	68.1%	63.9%	20.4%
Change	-23.8%	19.2%	-7.1%	-7.3%	9.2%
		1	Admission Yie	ld	
Period A	21.5%	58.6%	33.5%	35.8%	8.6%
Period B	15.3%	49.9%	29.8%	28.4%	8.3%
Change	-15.5%	5.3%	-8.4%	-7.4%	4.8%
		1	Admission Inde	ex	
Period A	0.288	1.795	0.459	0.582	0.348
Period B	0.252	1.907	0.383	0.575	0.481
Change	-52.5%	142.3%	-18.0%	-7.2%	33.8%
		Average 7	5th Percentile	ACT Score	
Period A	24.00	34.40	28.00	28.63	2.84
Period B	24.69	35.55	29.00	29.61	2.93
Change	-3.0%	8.4%	3.6%	3.5%	2.4%
		(Completion Ra	te	
Period A	23.7%	94.0%	69.3%	68.1%	13.7%
Period B	37.4%	95.9%	74.9%	74.0%	13.3%
Change	-19.2%	14.5%	7.0%	5.8%	5.7%
		Freshme	en Enrollment	Increases	
Period A	-9.8%	17.2%	0.7%	1.0%	5.3%
Period B	-3.9%	10.7%	0.5%	0.8%	3.5%
Change	-13.1%	15.8%	-0.3%	-0.2%	6.0%
		Freshmen to	Sophomore R	etention Rates	
Period A	52.7%	97.3%	86.6%	84.4%	10.4%
Period B	64.3%	98.4%	86.6%	86.3%	7.9%
Change	-5.0%	12.8%	0.7%	1.9%	4.0%
		Total Full-Tin	ne Undergradı	ate Headcour	it
Period A	1,048	7,874	3,131	3,994	1,810

Distribution of Enrollment Variables, by Period

Period B	2,459	13,272	3,773	4,998	2,737	
Change	-12.1%	245.8%	13.6%	27.7%	48.0%	

Table 51 displays the distribution of enrollment variables by institutional category in period A. For enrollment variables in period A, the low change category had the largest *total full-time undergraduate headcount* and had the best values for each enrollment variable with the exception of *admission yield* and *freshmen enrollment increases*. The high and medium change categories were not always ranked consistently, but the medium change institutions had the lowest values for most enrollment variables. The medium change institutions had the highest average *freshmen enrollment increase* in period A.

Category	Minimum	Maximum	Median	Mean	Std. Deviation				
		Acceptance Rate							
High Change	68.0%	98.4%	81.6%	81.8%	8.0%				
Medium Change	62.3%	87.5%	81.9%	80.1%	7.6%				
Low Change	22.3%	75.5%	41.5%	50.4%	21.2%				
		I	Admission Yi	eld					
High Change	30.4%	55.4%	37.7%	39.2%	7.8%				
Medium Change	25.5%	40.6%	32.4%	32.6%	5.0%				
Low Change	21.5%	58.6%	32.6%	35.3%	11.4%				
		A	Admission Ind	dex					
High Change	0.390	0.581	0.461	0.478	0.073				
Medium Change	0.313	0.551	0.390	0.411	0.078				
Low Change	0.288	1.795	0.787	0.869	0.508				
		Average 7	5th Percentile	e ACT Score					
High Change	24.28	29.68	27.50	27.30	1.47				
Medium Change	26.00	29.00	28.00	27.65	1.08				
Low Change	24.00	34.40	32.18	31.08	3.67				
		(Completion R	ate					
High Change	52.5%	77.2%	68.5%	68.5%	7.0%				
Medium Change	45.0%	72.2%	67.6%	65.1%	8.4%				
Low Change	23.7%	94.0%	75.4%	70.9%	21.6%				
		Freshme	en Enrollmen	t Increases					
High Change	-9.8%	8.4%	1.3%	0.3%	4.6%				

Distribution of Enrollment Variables by Institutional Category, Period A

Medium Change	-7.4%	17.2%	-0.8%	1.7%	7.3%					
Low Change	-4.7%	7.7%	1.1%	1.0%	3.8%					
	Freshmen-to-Sophomore Retention Rates									
High Change	62.3%	92.7%	85.9%	83.3%	8.3%					
Medium Change	52.7%	89.5%	85.8%	82.1%	11.3%					
Low Change	61.3%	97.3%	91.7%	87.9%	11.5%					
	Total Full-Time Undergraduate Headcount									
High Change	2,369	4,447	2,839	3,169	800					
Medium Change	1,048	7,000	3,078	3,858	2,023					
Low Change	1,979	7,874	5,376	4,955	2,005					

Table 52 displays the distribution of enrollment variables by institutional category for period B. Despite their low change to *freshmen discount rate* the low change institutions maintained their dominant position in all enrollment variables except *freshmen enrollment increases* and *admission yield*. The medium change institutions had the largest average *freshmen enrollment increases* and the high change institutions had the largest *admission yield*.

Category	Minimum	Maximum	Median	Mean	Std. Deviation			
	Acceptance Rate							
High Change	55.8%	88.3%	78.7%	76.6%	10.3%			
Medium Change	61.2%	82.2%	69.6%	71.0%	7.3%			
Low Change	19.8%	67.8%	31.3%	42.6%	21.6%			
		Adm	ission Yield	d				
High Change	23.9%	39.9%	32.9%	32.1%	5.4%			
Medium Change	16.1%	30.4%	21.4%	22.8%	5.2%			
Low Change	15.3%	49.9%	9.9% 30.5%		10.7%			
		Adm	ission Index	X				
High Change	0.315	0.627	0.417	0.425	0.090			
Medium Change	0.253	0.467	0.284	0.323	0.076			
Low Change	0.252	1.907	1.097	0.992	0.686			
		Average 75th	Percentile A	ACT Score				
High Change	26.31	31.31	28.00	28.27	1.46			
Medium Change	26.33	30.00	29.00	28.41	1.15			
Low Change	24.69	35.55	33.54	32.30	3.62			
		109						

Distribution of Enrollment Variables by Institutional Category, Period B

	Completion Rate						
High Change	47.2%	86.4%	74.6%	71.2%	11.7%		
Medium Change	59.5%	79.1%	74.1%	72.8%	6.2%		
Low Change	37.4%	95.9%	83.5%	77.9%	19.1%		
		Freshmen	Enrollment l	Increases			
High Change	-2.8%	6.0%	0.2%	0.8%	3.0%		
Medium Change	-3.4%	10.7%	1.1%	1.6%	4.4%		
Low Change	-3.9%	4.3%	0.4%	0.0%	2.9%		
		Freshmen to S	ophomore Re	etention Rate	es		
High Change	75.2%	93.6%	86.1%	86.0%	4.9%		
Medium Change	64.3%	88.9%	86.5%	83.9%	7.3%		
Low Change	65.5%	98.4%	92.7%	88.9%	10.4%		
		Total Full-Time Undergraduate Headcount					
High Change	2,459	5,850	2,917	3,378	1,109		
Medium Change	2,687	13,272	3,688	5,153	3,343		
Low Change	2,884	10,146	6,578	6,464	2,529		

Table 53 displays the change between period A and period B by institutional category for the enrollment variables. The *acceptance rates* for the high change institutions dropped by an average of 5.2% while the *acceptance rates* of the medium and low change categories dropped 9.1% and 7.8%, respectively. *Admission yields* also dropped across all three categories. The medium change institutions experienced the sharpest decline in *admission yields*, 9.8%. The *admission index* fell for both the high and medium change categories and it rose for the low change category. The combination of consistent decreases in both *acceptance rates* and *admission yields* indicated the population of institutions became more selective and faced increasingly challenging competition.

The high change institutions experienced a 3.6% increase in the *average 75th percentile ACT score*, the medium change institutions had an increase of 2.8% and the low change institutions experienced a 4.0% increase. The medium and low change institutions experienced greater improvements to *completion rates* and *total full-time undergraduate headcount*. The high change institutions experienced greater improvements to *freshmen*

enrollment increases and *freshmen to sophomore retention rates*. Otherwise, the high change to *freshmen discount rate* for the high category did not result in comparatively large improvements in enrollment variables.

Distribution of Enrollment Variables by Institutional	Category, Change Between Period A and Period B
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Category	Minimum	Maximum	Median	Mean	Std. Deviation			
		Acceptance rate						
High Change	-21.0%	3.8%	-3.8%	-5.2%	8.3%			
Medium Change	-23.8%	19.2%	-10.7%	-9.1%	12.3%			
Low Change	-21.6%	0.8%	-5.6%	-7.8%	6.9%			
			Admission Yie	ld				
High Change	-15.5%	-0.5%	-7.3%	-7.1%	4.2%			
Medium Change	-13.0%	-5.3%	-9.9%	-9.8%	2.7%			
Low Change	-14.6%	5.3%	-8.2%	-5.5%	6.5%			
		1	Admission Ind	ex				
High Change	-25.6%	22.0%	-18.0%	-10.5%	16.5%			
Medium Change	-52.5%	-3.3%	-19.1%	-20.6%	14.6%			
Low Change	-34.0%	142.3%	2.5%	10.0%	52.8%			
		Average 7	5th Percentile	ACT Score				
High Change	-1.2%	8.4%	3.7%	3.6%	2.5%			
Medium Change	-3.0%	5.8%	3.6%	2.8%	2.8%			
Low Change	2.5%	7.4%	3.4%	4.0%	1.6%			
			Completion Ra	ite				
High Change	-19.2%	9.8%	4.0%	2.8%	8.2%			
Medium Change	3.1%	14.5%	7.3%	7.7%	3.0%			
Low Change	1.6%	13.7%	7.8%	7.0%	3.8%			
		Freshme	en Enrollment	Increases				
High Change	-3.5%	15.8%	-1.0%	0.5%	5.7%			
Medium Change	-13.1%	11.1%	1.5%	0.0%	7.1%			
Low Change	-11.6%	6.4%	0.2%	-1.0%	5.5%			
		Freshmen to	Sophomore R	etention Rates				
High Change	-1.2%	12.8%	0.6%	2.8%	4.6%			
Medium Change	-5.0%	11.6%	0.7%	1.8%	5.1%			
Low Change	-2.5%	4.2%	1.1%	1.1%	2.0%			
		Total Full-Ti	ne Undergradu	uate Headcoun	t			
High Change	-12.1%	31.6%	4.2%	5.8%	12.4%			
Medium Change	-0.1%	245.8%	15.2%	43.7%	75.3%			
Low Change	1.3%	72.8%	27.7%	33.6%	27.1%			

Correlations and partial correlations.

Table 54 displays correlations between institutional grant and enrollment variables by period. In both periods A and B, the *percentage of freshmen grant recipients* had large, positive associations with the *acceptance rate* and large negative associations with the *admission index* and 75th percentile ACT scores. Also, the *percentage of freshmen grant recipients* had a medium negative association with *freshmen enrollment increases* in period A and a medium negative association with *total full-time undergraduate headcount* in period B. Increases in *percentage of freshmen grant recipients* had a negative association with *total full-time undergraduate headcount* in period P. Increases in *percentage of freshmen grant recipients* had a negative impact on several enrollment variables.

The *freshmen grant recipient discount rate* had a large negative association with *acceptance rate* in both periods. Also, in both periods, the *freshmen grant recipient discount rate* had a large association with the *admission index*, 75th percentile ACT score, and *completion rate. Freshmen grant recipient discount rate* had a medium association with *freshmen to sophomore retention rates* in period A and an even larger association in period B. Finally, the *freshmen grant recipient discount rate* had a medium association with *total full-time undergraduate headcount* in period A. Increases in the *freshmen grant recipient discount rate* had a medium association with *total discount rate* made a positive impact on several enrollment variables.

The *freshmen discount rate* had large negative associations with *acceptance rate* and *freshmen enrollment increases* and large, positive associations with the *admission index, average 75th percentile ACT score, completion rate,* and *freshmen to sophomore retention rate* in period A. By period B, the associations had decreased and in some cases, reversed. For instance, the large negative association with *acceptance rate* in period A turned to a medium, positive association in period B. Also, the large, positive associations with

admission index and *average 75th percentile ACT score* were now medium negative associations. The large association between *freshmen discount rate* and *freshmen to sophomore retention rate* in period A was reduced to a medium association in period B. Also, the medium association between *freshmen discount rate* and *total full-time undergraduate headcount* in period A reversed to a medium negative association in period B. Finally, there were no significant associations between the changes in institutional grants and the changes to enrollment variables from period A to period B.

In many cases, the initial levels of positive association between *freshmen grant recipient discount rate* or *freshmen discount rate* and enrollment variables were reduced or even reversed over the time period of this study. Said another way, many of the associations between institutional grant variables and enrollment variables became diluted over time. This may have been a result of the fact *percentage of freshmen discount rates* increased over the period of the study.

Correlations Between Institutional Grant and Enrollment Variables, by Period

Variable	%_REC	REC_DR%	FR_DR%
		Period A	
Acceptance rate	.69**	82**	65**
Admission Yield	09	.02	18
Admission Index	64**	.73**	.50**
Average 75th Percentile ACT Score	74**	.82**	.60**
Completion Rate	.25	.60**	.57**
Freshmen Enrollment Increases	49**	04	51**
Freshmen to Sophomore Retention Rates	.30	.43*	.64**
Total Full-Time Undergraduate Headcount	21	.44*	.37*
		Period B	
Acceptance rate	.87**	70**	.42*
Admission Yield	36	.23	29
Admission Index	85**	.69**	43*
Average 75th Percentile ACT Score	87**	.66**	46*

Completion Rate	.42*	.61**	.26
Freshmen Enrollment Increases	06	29	14
Freshmen to Sophomore Retention Rates	.19	.72**	.43*
Total Full-Time Undergraduate Headcount	38*	.16	37*
	Change	from Period A to	Period B
Acceptance rate	01	.10	.09
Admission Yield	13	18	18
Admission Index	20	28	29
Average 75th Percentile ACT Score	.10	.76	.84
Completion Rate	.19	20	20
Freshmen Enrollment Increases	24	.17	.12
Freshmen to Sophomore Retention Rates	.05	.08	.24
Total Full-Time Undergraduate Headcount	.02	30	14

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 55 displays the correlations between institutional grant variables and enrollment variables by institutional category in period A. The high change group of institutions had no significant associations between the *percentage of freshmen grant recipients* and enrollment variables. This group had a large negative association between the *freshmen grant recipient discount rate* and the *admission index* and between the *freshmen discount rate* and the *admission index*. The general lack of associations between the institutional grant and enrollment variables made the high change category of institutions unique.

The medium change category of institutions had a large positive association between the *percentage of freshmen grant recipients* and both the *completion rate* and *freshmen to sophomore retention rates*. This category had a large negative association between the *percentage of freshmen grant recipients* and *freshmen enrollment increases*. *Freshmen grant recipient discount rate* had a large negative association with *completion rate*. These institutions also had a large, positive association between the *freshmen discount rate* and both the *completion rate* and *freshmen to sophomore retention rate*. Finally, this category of institutions had a large negative association between the *freshmen discount rate* and *freshmen enrollment increases*. In summary, the medium changes to *freshmen discount rate* had mixed results for these institutions.

The low change category of institutions had the most significant associations in period A. The decreases in *freshmen discount rate* for the low change category resulted in a mix of associations with the variables of this study. These institutions had a large positive association between the *percentage of freshmen grant recipients* and *acceptance rate* and a large negative association between the *percentage of freshmen grant recipients* and *average 75th percentile ACT scores*. Also, these institutions had large positive associations between *freshmen grant recipient discount rate* and each of the variables *admission index, average 75th percentile ACT score* and *completion rate*. This category had a large negative association between *freshmen grant recipient discount rate* and *acceptance rate*. It also had a large negative association between *freshmen discount rate* and *freshmen enrollment increases*. Finally, these institutions had large positive associations between the *freshmen discount rate* and each of the variables *ACT score, completion rate*, and *freshmen enrollment increases*.

Correlations Between Institutional Grant Variables and Enrollment Variables, by Institutional Category, Period A

		%_REC	2	R	EC_DR%	ó		FR_DR%	6
Variable	Н	М	L	Н	М	L	Н	М	L
Acceptance rate	.51	23	.72*	01	01	70*	.34	30	54
Admission Yield	.04	24	27	56	.53	.36	38	.13	.21
Admission Index	26	011	65	73*	.44	.69*	71*	.34	.53
Average 75th Percentile ACT Score	26	.31	88**	28	01	.87**	39	.37	.81**
Completion Rate	.26	.86**	.16	.11	72*	.89**	.24	.85**	.90**

Freshmen Enrollment Increases	31	88**	09	27	.70*	38	42	85**	64*
Freshmen to Sophomore Retention Rates	08	.83**	.22	.02	71*	.88**	06	.83**	.94**
Total Full-Time Undergraduate Headcount	29	.37	40	.28	44	.48	02	.34	07

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 56 displays correlations between institutional grant variables and enrollment variables, by institutional category in period B. The high change institutions had a significant, large negative correlation between the *percentage of freshmen grant recipients* and the *admission index*. Like in period A, the high change category of institutions had the fewest significant associations.

The medium change institutions had a large positive association between the *percentage of freshmen grant recipients* and *completion rate* and between *percentage of freshmen grant recipients* and *freshmen to sophomore retention rates*. This group also had large positive associations between the *freshmen discount rate* and *completion rate* and between *freshmen discount rate* and *freshmen to sophomore retention rates*.

Like in period A, the low change category of institutions remained the category with the most significant associations between institutional grant variables and enrollment variables. These institutions had a large positive association between the *percentage of freshmen grant recipients* and *acceptance rate* and large negative correlations between the *percentage of freshmen grant recipients* and both the *admission index* and *average 75th percentile ACT score*. The low change category also had large negative correlations between the *freshmen grant recipient discount rate* and *acceptance rate* and large positive correlations between the *freshmen grant recipient discount rate* and *acceptance rate* and large positive correlations *percentile ACT, completion rate* and *freshmen to sophomore retention rates*. Finally, these institutions had a large positive correlation between the *freshmen discount rate* and the *acceptance rate*.

The general lack of associations between institutional grant and enrollment variables at the high change institutions may have played a part in the decisions to increase *freshmen discount rate* at an aggressive pace. On the other hand, the more frequent occurrence and level of positive associations between institutional grant and enrollment variables in the low change category may partially explain the decisions to minimize or reduce the *freshmen discount rate* offered by these institutions.

Table 56

Correlations Between Institutional Grant Variables and Enrollment Variables, by Institutional Category, Period B

	%_REC			REC_DR%			FR_DR%		
Variable	Н	М	L	Н	М	L	Н	М	L
Acceptance rate	.57	.11	.86**	37	.07	74*	12	.11	.68*
Admission Yield	19	28	56	51	.12	.56	51	07	40
Admission Index	63*	31	82**	09	.15	.76*	31	07	60
Average 75th Percentile ACT Score	62	05	87**	16	18	.83**	38	13	49
Completion Rate	35	.82**	04	.08	.56	.87**	07	.70*	.49
Freshmen Enrollment Increases	.08	38	.17	35	41	.05	25	38	.28
Freshmen to Sophomore Retention Rates	39	.89**	.04	.02	.75*	.87**	14	.79**	.56
Total Full-Time Undergraduate Headcount	.09	.02	57	31	.05	.18	25	04	68*

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 57 displays the correlations between the changes in institutional grant and enrollment variables by institutional category. The high change category had a large positive correlation between the change in the *freshmen grant recipient discount rate* and the change in *average 75th percentile ACT score* and between changes in *freshmen discount rate* and changes in *freshmen to sophomore retention rates*. Otherwise, the high change in *freshmen discount rate* by this category of institutions was not significantly correlated with changes to enrollment variables.

The medium change category had a large negative correlation between changes in *freshmen grant recipient discount rate* and *completion rate*. These institutions also had a large negative correlation between changes in *freshmen grant recipient discount rates* and changes in *freshmen to sophomore retention rates*. Finally, these institutions had a large negative correlation between changes in the *freshmen grant recipient discount rate* and changes to *total full-time undergraduate headcount*.

The low change category of institutions had the least number of significant correlations between changes in institutional grant variables and changes in enrollment variables. These institutions had large positive correlations between changes in *freshmen grant recipient discount rates* and *total full-time undergraduate headcount* and between changes in *freshmen discount rates* and *total full-time undergraduate headcount*.

Table 57

		%_REC	2	F	REC_DR9	6	F	R_DR	%
Variable	Н	М	L	Н	М	L	Н	М	L
Acceptance rate	0.4	-0.3	-0.2	-0.5	0.32	0.13	-0.2	0.28	-0.1
Admission Yield	-0.1	0.03	0	0.36	0.28	-0.2	0.5	0.54	-0.4
Admission Index	-0.4	0.24	-0.1	0.58	-0.1	-0.1	0.4	0.08	-0.2
Average 75th Percentile ACT Score	-0.5	0.06	-0.3	.70*	-0.36	0.56	0.4	-0.5	0.35
Completion Rate	0.2	0.04	0.28	0.07	78**	0.36	0.3	-0.1	0.16
Freshmen Enrollment Increases	-0.3	-0.1	-0.4	0.43	0.56	-0.1	0.3	0.27	-0.2
Freshmen to Sophomore Retention Rates	-0.1	-0.1	0.57	0.58	65*	0.18	.71*	-0.2	0.26
Total Full-Time Undergraduate Headcount	-0	-0.1	0.12	0.19	89*	.77*	0.2	-0.2	.70*

Correlations Between Institutional Grant Variables and Enrollment Variables, by Institutional Category, Change from Period A to Period B

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 58 displays the partial correlations between institutional grant and enrollment variables when controlling the variable *total full-time undergraduate headcount*. The *percentage of freshmen grant recipients* had large negative associations with several enrollment variables in both periods A and B. Also, in both periods A and B, *freshmen grant recipient discount rates* had large positive associations with each enrollment variable except *admission yield* and *freshmen enrollment increases*. In period B *freshmen discount rates* had medium negative associations with *admission index* and *average 75th percentile ACT score*.

Table 58

Variable	% REC	REC DR%	FR DR%
		Period A	
Acceptance rate	.63**	79**	61**
Admission Yield	10	.02	20
Admission Index	55**	.66**	.42*
Average 75th Percentile ACT Score	69**	.79**	.55**
Completion Rate	48*	.61**	.39*
Freshmen Enrollment Increases	02	27	37
Freshmen to Sophomore Retention Rates	46	.50**	.34
		Period B	
Acceptance rate	.85**	70**	.32
Admission Yield	45*	.24	37
Admission Index	86**	.68**	38*
Average 75th Percentile ACT Score	88**	.65**	41*
Completion Rate	70**	.56**	28
Freshmen Enrollment Increases	00	11	17
Freshmen to Sophomore Retention Rates	77**	.56**	37
	Change	from Period A to H	Period B
Acceptance rate	01	.09	.08
Admission Yield	13	17	17
Admission Index	19	27	28
Average 75th Percentile ACT Score	31	.08	.00
Completion Rate	.15	10	09
Freshmen Enrollment Increases	23	.05	04
Freshmen to Sophomore Retention Rates	.02	.25	.31

Partial Correlations Between Institutional Grant and Enrollment Variables Controlling for Full-Time Undergraduate Headcount, by Period

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

When controlling for the variable *institutional wealth*, associations between institutional grant and enrollment variables were smaller than the associations when the variable *total full-time undergraduate headcount* was controlled (Table 59). The level of associations decreased for each enrollment variable and in some cases nullified significant associations. Essentially, in both periods A and B, differences in *institutional wealth* had a larger impact on the enrollment variables than differences in *total full-time undergraduate headcount*.

wealth, by I eriba					
Variable	%_REC	REC_DR%	FR_DR%		
		Period A			
Acceptance rate	.42*	58**	34		
Admission Yield	23	.19	13		
Admission Index	44*	.58**	.22		
Average 75th Percentile ACT Score	48*	.49**	.13		
Completion Rate	27	.39*	.08		
Freshmen Enrollment Increases	31	.03	20		
Freshmen to Sophomore Retention Rates	29	.28	.07		
Total Full-Time Undergraduate Headcount	34	.43*	.18		
		Period B			
Acceptance rate	.47*	14	.17		
Admission Yield	18	03	18		
Admission Index	29	.03	20		
Average 75th Percentile ACT Score	45*	01	25		
Completion Rate	23	.07	09		
Freshmen Enrollment Increases	.16	22	09		
Freshmen to Sophomore Retention Rates	35	04	24		
Total Full-Time Undergraduate Headcount	44*	12	39*		
	Change from Period A to Period B				
Acceptance rate	03	.09	.06		
Admission Yield	12	17	15		
Admission Index	20	28	30		
Average 75th Percentile ACT Score	30	.08	.00		

Partial Correlations Between Institutional Grant and Enrollment Variables Controlling for Institutional Wealth, by Period

Completion Rate	.14	12	13
Freshmen Enrollment Increases	19	.08	.06
Freshmen to Sophomore Retention Rates	.04	.27	.36
Total Full-Time Undergraduate Headcount	.00	07	13

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Financial Variables

Distributions.

Table 60 displays the distributions for the financial variables for each period of this study. Over the period of this study, institutional wealth increased an average of 175%. Also, net tuition and fees increased 66.3% from period A to period B. On average, tuition and fees changed \$11,553, but the net tuition and fees changed about \$7,300 for every freshman and about \$8,518 for every grant recipient. On average, increases in institutional grants did not keep pace with increases in *tuition and fees*.

-		-			
Period	Minimum	Maximum	Median	Mean	Std. Deviation
			Institutional V	Vealth	
Period A	13,867	1,253,224	88,468	217,675	310,658
Period B	36,067	3,290,049	250,050	576,772	825,440
Change	65.7%	306.9%	164.9%	175.3%	59.6%
			Tuition		
Period A	10,825	25,334	16,903	17,502	3,962
Period B	13,445	40,009	28,613	29,055	6,380
Change	24.2%	93.0%	66.3%	66.3%	12.9%
			Net Tuition an	d Fees	
Period A	6,849	13,113	9,748	9,836	1,319
Period B	11,679	26,880	16,093	17,170	4,143
Change	11.7%	159.6%	62.4%	75.9%	40.8%
		Ree	cipient Net Tuiti	on and Fees	
Period A	(8,639)	11,897	7,917	6,063	4,997
			121		

Distribution of Financial Variables, by Period

Period B	10,583	20,274	14,442	14,581	2,056
Change	2,071	22,735	6,842	8,518	5,164

Table 61 displays the distribution of financial variables by institutional category for period A. The high change institutions had mean *institutional wealth* of \$72 million and the low change institution had mean *institutional wealth* of \$497 million. The high change institutions had the lowest average *tuition and fees* but the highest average *net tuition and fees* and *recipient net tuition and fees*. Meanwhile, the low change category, used a more aggressive high tuition, high aid strategy that resulted in higher *tuition and fees* and lower average *net tuition and fees* and *recipient net tuition and fees*. In fact, at \$793, the mean *recipient net tuition and fees* was dramatically low compared to the high and medium change institutions. Across all financial variables, the medium change institutions had mean values that fell between the mean values for the high and low change categories.

Category	Minimum	Maximum	Median	Mean	Std. Deviation			
	Institutional Wealth							
High Change	29,846	126,871	75,205	72,413	33,920			
Medium Change	13,867	117,424	88,467	83,879	29,151			
Low Change	24,723	1,253,224	405,158	496,734	423,212			
			Tuition and Fe	ees				
High Change	11,559	19,630	16,058	15,792	2,344			
Medium Change	10,825	18,076	16,353	16,098	2,055			
Low Change	11,872	25,334	21,776	20,615	4,966			
		N	let Tuition and	Fees				
High Change	8,560	13,113	10,556	10,541	1,459			
Medium Change	8,507	11,247	9,740	9,644	830			
Low Change	6,849	11,306	9,493	9,321	1,378			
	Recipient Net Tuition and Fees							
High Change	7,917	11,897	9,110	9,603	1,572			
Medium Change	3,360	8,947	7,600	7,266	1,551			
Low Change	(8,639)	8,097	46	793	5,763			

Distribution of Financial Variables by Institutional Category, Period A

Table 62 displays the distribution of financial variables by institutional category for period B. The low change institutions continued to have much higher average *institutional wealth*, nearly six times the average *institutional wealth* of the institutions in the medium or low categories. The low change institutions also continued to have the highest average *tuition and fees*. The large increases in *freshmen discount rate* made by the high and medium change institutions resulted in the lowest average *net tuition and fees* and *recipient net tuition and fees* that the high and medium change institutions adopted a more aggressive pricing strategy in the 10-year period of this study. Ranges that overlap between categories also made it evident that institutions adopted a wide variety of pricing strategies.

Category	Minimum	Maximum	Median	Mean	Std. Deviation			
-	Institutional Wealth							
High Change	90,031	374,749	223,707	217,724	96,676			
Medium Change	36,067	368,311	227,835	224,840	93,398			
Low Change	72,992	3,290,049	979,268	1,287,751	1,155,371			
			Tuition and	Fees				
High Change	22,309	35,550	26,367	27,462	4,031			
Medium Change	13,445	29,403	27,733	26,058	4,747			
Low Change	18,985	40,009	37,398	33,646	7,494			
			Net Tuition an	nd Fees				
High Change	11,679	20,086	14,862	15,123	2,224			
Medium Change	12,786	18,182	15,354	15,235	2,030			
Low Change	12,961	26,880	21,445	21,151	4,452			
		Recij	pient Net Tuiti	on and Fees				
High Change	11,552	17,056	14,487	14,428	1,613			
Medium Change	10,583	16,894	14,355	14,231	2,036			
Low Change	12,366	20,274	14,152	15,138	2,582			

Distribution of Financial Variables by Institutional Category, Period B

Table 63 displays the distribution of changes from time period A to time period B for financial variables and is organized by institutional change category. The high change institutions experienced the largest percentage change to *institutional wealth*. These high change institutions also had the largest percentage change in *tuition and fees*. The use of high tuition discounts kept the increases in *recipient net tuition and fees* lower at these institutions.

The medium change institutions had the second largest percentage change to *institutional wealth*. These institutions had the smallest change in *tuition and fees* and the second largest change in dollar values in both *net tuition and fees* and *recipient net tuition and fees*. The low change institutions had the smallest percentage change in *institutional wealth* despite having significantly larger percentage changes in *net tuition and fees* and *dollar changes in recipient net tuition and fees*. Due to the vast differences in *institutional wealth* in period A, percentage changes to this variable can be misleading. Low change institutions increased their *institutional wealth* by an average of nearly \$800 million. This compares to increases of only about \$150 million for the medium and high change categories. The *institutional wealth* gap widened.

Category	Minimum	Maximum	Median	Mean	Std. Deviation				
_		Institutional Wealth							
High Change	147.8%	306.9%	209.1%	208.2%	51.0%				
Medium Change	97.0%	263.2%	161.2%	166.1%	48.6%				
Low Change	65.7%	278.2%	144.3%	151.7%	67.6%				
-			Tuition						
High Change	60.6%	93.0%	72.7%	74.3%	10.0%				
Medium Change	24.2%	79.4%	61.4%	60.7%	16.1%				
Low Change	56.2%	79.6%	61.5%	63.9%	7.8%				
	Net Tuition and Fees								
High Change	11.7%	69.0%	45.3%	44.3%	16.8%				

Distribution of Financial Variables by Institutional Category, Change Between Period A and Period B

Medium Change	24.7%	82.3%	59.3%	57.9%	15.5%
Low Change	89.2%	159.6%	127.7%	125.6%	25.3%
		Recipie	ent Net Tuition	n and Fees	
High Change	2,071	6,178	5,149	4,826	1,306
Medium Change	4,396	9,517	7,236	6,966	1,483
Low Change	6,572	22,735	15,377	14,345	5,540

Correlations and partial correlations.

Table 64 displays the correlations between institutional grant variables and financial variables for period A, period B, and the change from period A to period B. In period A, *percentage of freshmen grant recipients* had a large association with *recipient net tuition and fees*. In period B, *percentage of freshmen grant recipients* had medium negative associations with *institutional wealth* and *net tuition and fees*.

In period A, *freshmen grant recipient discount rate* had a large positive association with *institutional wealth* and *tuition and fees*. It also had a large negative association with *recipient net tuition and fees*. Similarly, *freshmen discount rate* had a large positive association with *institutional wealth* and *tuition and fees* and a large negative association with *recipient net tuition and fees*. In period B, *freshmen grant recipient discount rate* had a large positive association with *institutional dees*. In period B, *freshmen grant recipient discount rate* had a large positive association with *institutional wealth* and *tuition and fees*. *Freshmen discount rate* had a large positive association with *institutional wealth* and *tuition and fees*. *Freshmen discount rate* had no significant association with financial variables in period B. Changes in *freshmen grant recipient discount rate* and *freshmen discount rate* had large negative associations with changes in *net tuition and fees* and *recipient net tuition and fees*.

Table 64

Variable % REC **REC DR%** FR DR% Period A .76** .61** Institutional Wealth -.27 .77** .78** Tuition and Fees -.03 Net Tuition and Fees -.02 -.09 -.29 .70** -.97** -.56** **Recipient Net Tuition and Fees** Period B Institutional Wealth -.46* .71** -.08 Tuition and Fees -.01 .82** .35 -.48** .55** Net Tuition and Fees -.23 **Recipient Net Tuition and Fees** .26 -.08 .06 Change from Period A to Period B Institutional Wealth .14 .10 .20 Tuition and Fees -.08 .50** .32 Net Tuition and Fees -.18 -.76** -.93** -.89** **Recipient Net Tuition and Fees** .05 -.92**

Correlations Between Institutional Grant Variables and Financial Variables, by Period

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 65 displays the correlations between institutional grant variables and financial variables by change category. The high change category had no significant associations in period A. In period B, these institutions had a large negative association between *percentage of freshmen grant recipients* and *net tuition and fees*. The high change institutions also had a large positive association between *recipient discount rate* and *tuition and fees*. This is evidence of the adoption of a high tuition, high aid strategy by these institutions.

In both periods A and B, the medium change category had a large positive association between *percentage of freshmen grant recipients* and *institutional wealth*. These institutions also had a large positive association between *freshmen discount rate* and *institutional wealth*. In both periods A and B, *percentage of freshmen grant recipients* and *freshmen discount rate* had a large positive association with *tuition and fees*. This is another indicator of the use of high tuition, high aid strategies. In period A, *percentage of freshmen grant recipients* and *freshmen discount rate* had large positive associations with *recipient net tuition and fees*. Also, *freshmen grant recipient discount rate* had a large negative association with *recipient net tuition and fees*. In period A, larger *freshmen grant recipient discount rate* meant lower *recipient net tuition and fees*. In period B, there was not a significant association between institutional grant variables and *recipient net tuition and fees*, which was an indication these institutions changed their pricing and grant awarding strategies over time.

The low category of institutions had a large positive association between *freshmen grant recipient discount rate* and *tuition and fees* and a large negative association between *freshmen grant recipient discount rate* and *recipient net tuition and fees*. Like the medium change institutions in period A, a larger *freshmen grant recipient discount rate* meant lower *recipient net tuition and fees*. Also, in period A, *freshmen discount rate* had a large negative association with *recipient net tuition and fees*. In period B, *freshmen grant recipient discount rate* had a large positive association with *institutional wealth*. Also, *freshmen grant recipient discount rate* had a large positive association with *tuition and fees* and *net tuition and fees*. Although, over time, these institutions had incremental changes in *freshmen grant recipient discount rates*, the *tuition and fees* increased at a higher incremental rate. This led to a large positive association between *freshmen grant recipient discount rate* and both *tuition and fees* and *net tuition and fees*.

For high change institutions, the change in *freshmen grant recipient discount rate* from period A to period B had a large negative association with the change in *recipient net tuition and fees*. Also, the change in *freshmen discount rates* had a large negative association with *net tuition and fees* and *recipient net tuition and fees*. The high changes to *freshmen* *discount rate* tended to reduce the net tuition at these institutions. For medium change institutions, the change in *freshmen grant recipient discount rate* had a large positive association with the change in *tuition and fees*. This is more evidence of the high tuition, high aid model. For low change institutions, the changes in *freshmen grant recipient discount rate* and *freshmen discount rate* had large negative associations with changes in *net tuition and fees* and *recipient net tuition and fees*. For the low category of institutions the negative changes in *freshmen grant recipient discount rate* and *freshmen discount rate* from period A to period B were associated with increases in *recipient net tuition and fees* and *net tuition and fees*.

Table 65

Correlations Between Institutional Grant Variables and Financial Variables, by Institutional Category and Period

Variable	%_REC			REC_DR%			FR_DR%		
	Н	M	L	Н	M	L	Н	M	L
	Period A								
Institutional Wealth	.35	.93**	13	.26	88**	.55	.39	.85**	.55
Tuition and Fees	.51	.85**	00	.28	62	.78*	.49	.89**	.80**
Net Tuition and Fees	.11	53	25	24	.24	.53	18	55	.34
Recipient Net Tuition and Fees	.49	.92**	.95**	38	92**	99**	03	.84**	71*
	Period B								
Institutional Wealth	16	.78**	44	.31	.67*	.88**	.18	.75*	.10
Tuition and Fees	18	.91**	03	.67*	.80**	.74*	.49	.84**	.48
Net Tuition and Fees	67*	.26	48	21	.04	.71*	44	.07	04
Recipient Net Tuition and Fees	44	.58	.38	34	.30	56	48	.38	.03
	Change from Period A to Period B								
Institutional Wealth	.38	01	.02	32	01	64	03	26	70*
Tuition and Fees	38	.20	.02	.07	.78**	.40	49	.36	.63*
Net Tuition and Fees	16	.39	15	37	.57	77*	87**	17	81**
Recipient Net Tuition and Fees	.33	.69*	.47	74*	34	98**	80**	57	78*

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 66 displays the partial correlations between institutional grant and financial variables controlling for the variable *total full-time undergraduate headcount*. When controlling for *total full-time undergraduate headcount*, the *percentage of freshmen grant recipients* had a large positive association with *institutional wealth* in period A and by period B this became a large negative association. Over time, institutions that reduced the proportion of their student body that received grants experienced larger increases to *institutional wealth*. Also, in period A, the *percentage of freshmen grant recipients* had a large positive association with *tuition and fees* and a large negative association with *recipient net tuition and fees*. By period B, both of these associations were insignificant. In period B, *percentage of freshmen grant recipients* had a medium negative association with *net tuition and fees*.

Freshmen grant recipient discount rates had large positive associations with *institutional wealth* and *tuition and fees* in both periods A and B. This is an indication that irrespective of the size of the *total full-time undergraduate headcount*, the institutions of this study consistently practiced a high tuition, high aid strategy. Also, *freshmen grant recipient discount rate* had medium negative associations with *net tuition and fees* and *recipient net tuition and fees in* period A. In period B, it had a large positive association with *net tuition and fees*.

Finally, in period A, *freshmen discount rate* had a large negative association with *institutional wealth* and *tuition and fees* and by period B there was no association between these variables. Also, in period A, *freshmen discount rate* had a medium association with *net tuition and fees* and a large association with *recipient net tuition and fees*. Changes in
freshmen grant recipient discount rate and *freshmen discount rate* had large negative associations with changes in *net tuition and fees* and *recipient net tuition and fees*.

Overall, the associations between institutional grant variables and *institutional wealth* variables when controlling for the variable of *total full-time undergraduate headcount* provide further evidence of the growing popularity of a high tuition, high aid strategy over the 10-year period of this study. Over time, it became more common for institutions to simultaneously minimize increases in *recipient net tuition and fees*, and to maximize increases to *net tuition and fees* and *institutional wealth*.

Table 66

Partial Correlations Between Institutional Grant and Financial Variables Controlling for Total Full-Time Undergraduate Headcount, by Period

Variable	%_REC	REC_DR% FR_DR%			
	Period A				
Institutional Wealth	.73**	.55**	58**		
Tuition and Fees	.71**	.72**	69**		
Net Tuition and Fees	11	38*	.46*		
Recipient Net Tuition and Fees	97**	46*	.61**		
	Period B				
Institutional Wealth	54** .70**		11		
Tuition and Fees	11	.81**	.33		
Net Tuition and Fees	48**	.54**	19		
Recipient Net Tuition and Fees	.31	11	.10		
	Change from Period A to Period B				
Institutional Wealth	.12	.02	.21		
Tuition and Fees	08 .41*		.31		
Net Tuition and Fees	23	84**	96**		
Recipient Net Tuition and Fees	.05	97**	90**		

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 67 displays the partial correlations between institutional grant and financial variables controlling for the variable *institutional wealth*. When *institutional wealth* was

held constant, *percentage of freshmen grant recipients* and *recipient net tuition and fees* had a large positive association in period A and no significant association in period B. In period B, *percentage of freshmen grant recipients* and *tuition and fees* had a medium association. Institutions who gave institutional grants to a higher proportion of their freshmen class experienced higher *recipient net tuition and fees* in period A and higher *tuition and fees* in period B.

In period A, *freshmen grant recipient discount rate* and *tuition and fees* had a medium association and by period B, this association became large. Also, *freshmen grant recipient discount rate* had a large negative association with *recipient net tuition and fees* in period A and this association disappeared by period B. The partial correlation coefficient between *freshmen discount rate* and *tuition and fees* were large in both periods A and B. *Freshmen discount rate* had a large negative association with *net tuition and fees* in period A and this association disappeared by B.

The change in *freshmen grant recipient discount rate* had a medium association with the change in *tuition and fees* and had large negative associations with both the variables *net tuition and fees* and *recipient net tuition and fees*. Also, the change in *freshmen discount rate* had large negative associations with the changes in both *net tuition and fees* and *recipient net tuition and fees*.

The partial correlations between institutional grant and *institutional wealth* variables when controlling for *institutional wealth* indicated a shift toward high tuition high aid strategies over the period of this study. Although there were increases in discount rates over the period of this study, these changes did not keep pace with changes to tuition and fees. The result was increases in recipient net tuition and fees and net tuition and fees, which

helped to increase institutional wealth.

Table 67

Partial Correlations Between Institutional Grant and Financial Variables Controlling for Institutional Wealth, by Period

Variable	%_REC	REC_DR%	FR_DR%		
	Period A				
Tuition and Fees	.18	.43*	.61**		
Net Tuition and Fees	13	25	50**		
Recipient Net Tuition and Fees	.64**	95**	23		
-	Period B				
Tuition and Fees	.47*	.61**	.56**		
Net Tuition and Fees	13	09	24		
Recipient Net Tuition and Fees	.29	08	.06		
	Change from Period A to Period B				
Tuition and Fees	06	.49**	.32		
Net Tuition and Fees	21	76**	93**		
Recipient Net Tuition and Fees	.06	92**	90**		

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

CHAPTER V

SUMMARY AND DISCUSSION

Introduction

This chapter includes a summary of information related to common institutional goals of the 30 largest 4-year PNP institutions in the Midwest and the associations of these goals with the institutional grant measures of *percentage of freshmen grant recipients, freshmen grant recipient discount rate* and *freshmen discount rate*. Content is divided into two sections: a summary of findings and conclusions and recommendations.

Summary of Findings

The purpose of this study was to generate data and reach conclusions that will enhance the ability of administrators to improve institutional financial aid decisions. Specifically, the research (a) examined differences in institutional grants among the largest 4year PNP institutions in the Midwest, (b) determined the level of association between institutional grants and measures of institutional goals (c) determined the level of association between institutional grants and measures of institutional goals when controlling for the effects of *total full-time undergraduate headcount* and *institutional wealth* and (d) determined whether the practice of tuition discounting has benefited the largest 4-year PNP institutions in the Midwest over the past decade. Addressing the overarching question of whether institutional grants influence the attainment of institutional goals, this study was guided by three primary research questions. A summary of the findings is provided for each of these questions.

Institutional Characteristics

What are the characteristics of each institution as described by institutional grant and goal variables? The findings related to this question were categorized as diversity, enrollment, financial, and institutional grant. Diversity variables included racial and ethnic diversity and socioeconomic diversity. Enrollment variables included acceptance rate, admission index, admission yield, average 75th percentile ACT score, completion rate, freshmen enrollment increases, freshmen-to-sophomore retention rates, and total full-time undergraduate headcount. Financial variables included institutional wealth, tuition and fees, net tuition and fees, and recipient net tuition and fees. Finally, institutional grant variables included freshmen discount rate, freshmen grant recipient discount rate, and percentage of freshmen grant recipients.

Diversity variables.

The study included two measures of diversity; *racial and ethnic diversity* and *socioeconomic diversity*. The population means of both diversity variables increased from period A to period B. The mean *racial and ethnic diversity* increased by 5.3%. The University of Chicago had the greatest increase in *racial and ethnic diversity* and, as a result, became the institution with the highest *racial and ethnic diversity* in period B. University of Northwestern Ohio ranked the highest in period A and had the greatest decline, -36.5%. Cedarville University had the lowest *racial and ethnic diversity* in both periods A and B.

From period A to period B the mean *socioeconomic diversity* for the population increased by 2.3%. Baldwin Wallace University had the greatest increase in *socioeconomic*

diversity and, as a result, became the institution with the highest *socioeconomic diversity* in period B. Cedarville University had the largest decline in *socioeconomic diversity*, with a change of -36.9%. Despite a large decrease of 12.0%, University of Northwestern Ohio had the highest *socioeconomic diversity* value in both periods A and B. Northwestern University had the lowest *socioeconomic diversity* in period A and Washington University in St. Louis and Oberlin College tied for the lowest *socioeconomic diversity* in period B.

Enrollment variables.

This study included eight enrollment variables; *acceptance rate, admission yield, admission index, average 75th percentile ACT score, completion rate, freshmen enrollment increases, freshmen-to-sophomore retention rates* and *total full-time undergraduate headcount.* The population of institutions generally experienced positive changes to enrollment variables. As measured by these variables, the institutions became more selective, improved the quality and size of their student bodies, and improved outcome variables of *freshmen-to-sophomore retention rates* and *completion rates. Acceptance rate, admission yield* and *freshmen enrollment increases* declined, which indicated an increasingly competitive market environment facing these institutions.

The mean *acceptance rate* for the population decreased by 7.3% and only six institutions increased their *acceptance rate* over the period of the study. Valparaiso University increased its *acceptance rate* by 19.2% and Marquette University decreased its *acceptance rate* by 23.8%. Washington University in St. Louis had the lowest *acceptance rate* in both periods and accepted 19.8% of applicants in period B. Calvin College had the highest *acceptance rate* in period A, accepting 98.4% of applicants, and Concordia College at Moorhead had the highest *acceptance rate* in period B, accepting 88.3% of applicants.

The College Board classifies selective institutions across 5 quintiles based on acceptance rate (Baum & Ma, 2013, Figure 26b). According to this classification, highly selective institutions accepted less than 25% of applicants. All highly selective institutions had an average *completion rate* of 88% and an average *freshmen-to-sophomore retention rate* of over 93% (Mortensen, 2011). In this study, Washington University in St. Louis and the University of Chicago are the only two institutions that met this highly selective standard in period B. Washington University in St. Louis had a *completion rate* of 93.7% and a *freshmen-to-sophomore retention rate* of 97.0%. University of Chicago had a *completion rate* of 98.4%. Further, with an *acceptance rate* of 25.4% University of Notre Dame was close to meeting the highly selective standard and also had very high *completion* and *freshmen-to-sophomore retention rates* of 95.9% and 97.5%, respectively.

The two quintiles representing the least selective institutions were those with an *acceptance rate* over 75% (Baum & Ma, 2013, Figure 26b). In this study nine institutions had an *acceptance rate* exceeding 75% in period B. Of these institutions, the highest *completion rate* was 76.9% and the highest *freshmen-to-sophomore retention rate* was 87.1%. Hope College, which had an *acceptance rate* of 82.2%, had the highest *completion rate* and *freshmen-to-sophomore retention rate* among these least selective institutions. The differences between the 10 most selective and 10 least selective institutions of this study are substantial. The average difference in *acceptance rates* was 38%, 81% to 43%. The 10 least selective institutions also had an average *freshmen-to-sophomore retention rate* of 85.7% compared to an average rate of 92.5% at the 10 most selective institutions. Finally, the 10

least selective institutions had an average *completion rate* in period B of 71.6% compared to an average rate of 84.6% at the 10 most selective institutions.

The mean *admission yield* decreased by 7.4% and only two institutions experienced an improvement in *admission yield*. By increasing *admission yield* by 5.4%, University of Chicago had the largest improvement. Calvin College experienced the largest decline in *admission yield* with a decrease of 15.5%. University of Notre Dame had the highest *admission yield* in both periods. It enrolled 58.6% of its admitted students in period A and 49.9% of its admitted students in period B. Loyola University had the lowest *admission yield* in period A, 21.5%, and Case Western Reserve University had the lowest *admission yield* in period B, 15.3%. Generally, the declining yields indicated a larger choice set for students and increased competition among institutions.

The *admission index* is calculated by dividing the *admission yield* by the *acceptance rate*. Institutions with a high *admission yield* and low *acceptance rate* have a high *admission index*. The population experienced a mean decline in *admission index* of 7.2%. This is a result of larger declines in *admission yield* than in *acceptance rates*. Despite drops in both *acceptance rate* and *admission yield* the institutions were able to maintain steady *freshmen enrollment increases* in both periods A and B. This is an indication that the institutions of this study received greater numbers of applicants over the course of the study period.

Only six institutions experienced an increase in *admission index*. University of Chicago experienced the largest increase in *admission index* and Valparaiso University experienced the largest decline. University of Notre Dame had the largest *admission index* in period A and University of Chicago had the largest *admission index* in period B. University of Chicago's *admission index* in period B was 1.907. In other words, its *admission yield* was nearly two times greater than its *acceptance rate*. Case Western Reserve University had the smallest *admission index* in both periods and in period B it had an *admission index* of 0.252. This indicated it had an *acceptance rate* that was nearly four times greater than its *admission yield*.

The institutions experienced a mean improvement in *average* 75th *percentile* ACT *scores*, improving by nearly 1 point from 28.63 in period A to 29.61 in period B. Only two institutions, Bradley University and Xavier University, experienced a decline in *average* 75th *percentile* ACT *scores*. The University of Findlay had the largest improvement, jumping over 2 points. University of Chicago had the largest average scores in both periods and Lewis University had the lowest average scores in both periods.

The population of institutions experienced a 5.8% increase in *completion rate* and had an average *completion rate* of 74.0% in period B. Concordia College at Moorhead was the only institution with a decline in *completion rate*, experiencing a drop of 19.2%. University of Northwest Ohio had the largest improvement, 14.5%. University of Notre Dame had the highest *completion rate* in both periods A and B and had a *completion rate* of 95.9% in period B. Columbia College Chicago had the lowest *completion rate* in both periods. At this institution only about one out-of-every three students completed their degree in 6 years.

Over the course of the study period the institutions experienced a decline in the rate of *freshmen enrollment increases*. In period A, the average *freshmen enrollment increase* was 1.0%. In period B, the average *freshmen enrollment increase* was 0.8%. Gustavus Adolphus College experienced the greatest change in *freshmen enrollment increases*. After experiencing declines of nearly 10% in period A, it grew at an average rate of 6.0% in period B. DePaul University experienced the largest negative change in *freshmen enrollment* *increases.* It had growth of 12.2% in period A and experienced a decline of 0.9% in period B. University of Northwestern Ohio had the largest *freshmen enrollment increases* in period A and Xavier University had the largest *freshmen enrollment increases* in period B. Gustavus Adolphus College had the largest decline in *freshmen enrollment increases* in period A and Case Western Reserve University had the largest decline in period B.

The population had average *freshmen-to-sophomore retention rates* of 86.3% in period B. Ten institutions experienced declines in *freshmen-to-sophomore retention rates*, with Xavier University experiencing the greatest decline, 5%. The University of Findlay had the greatest improvement with a *freshmen-to-sophomore retention rate* increase of 12.9%. Northwestern University had the greatest *freshmen-to-sophomore retention rate* in period A and University of Chicago led the way in period B with a 98.4% rate. University of Northwest Ohio had the lowest *freshmen-to-sophomore retention rate* in both periods A and B. This institution also had the second largest increase in *freshmen-to-sophomore retention rates*.

The population had average *total full-time undergraduate headcount* of 3,994 in period A and this grew to an average of 4,998 by period B; an average growth rate of 27.7%. Growth rates ranged from a high of 245.8% for the University of Northwestern Ohio to a negative growth rate of 12.1% for John Carroll University. The University of Notre Dame had the greatest enrollment in period A and DePaul University had the greatest enrollment in period B. DePaul added over 6,000 students and went from about 7,000 students in period A to 13,272 in period B. At 2,459 students, Gustavus Adolphus College had the lowest *total full-time undergraduate headcount* in period B.

Financial variables.

The study included four financial variables: *institutional wealth*, *tuition and fees*, *net tuition and fees*, and *recipient net tuition and fees*. On average, the institutions of this study experienced large gains for each of these financial variables. *Institutional wealth* grew 175%, *tuition and fees* grew 66%, *net tuition and fees* grew 76% and *recipient net tuition and fees* grew 140%. The fact *net tuition and fees* and *recipient net tuition and fees* grew at higher rates than *tuition and fees* is an indication of a shift in discounting strategies over the study period.

Institutional wealth grew at an average rate of 175.3%. Calvin College experienced the highest percentage change, 307%, and Case Western Reserve University experienced the lowest percentage change, 66%. The University of Chicago had the highest *institutional wealth* in both periods A and B and also experienced the largest dollar gain, just over \$2 Billion. The University of Northwest Ohio had the smallest *institutional wealth* in both periods.

Tuition and fees grew at an average rate of 66%, from an average of \$17,502 in period A to an average of \$29,055 in period B. Cedarville University, which had the second lowest *tuition and fees* value in period A, had the highest change in *tuition and fees*, 93%. Despite this high change, Cedarville ranked the third lowest for *tuition and fees* in period B. The University of Northwestern Ohio had the smallest change in *tuition and fees* and had the smallest *tuition and fees* in both periods. The University of Chicago had the highest *tuition and fees* in both periods and exceeded \$40,000 in period B.

Net tuition and fees grew at an average rate of 76%, from an average of \$9,836 in period A to an average of \$17,170 in period B. The fact *net tuition and fees* grew at a faster

rate than *tuition and fees* was an indication that increases in tuition discounts did not keep pace with increases in *tuition and fees*. Over time, *tuition and fees* and *net tuition and fees* rose, which made these PNPs generally less affordable to prospective students.

The University of Notre Dame had the largest change in average *net tuition and fees*, 160%, which represented a change of \$14,812. The University of Findlay had the smallest change, only 12%, or \$1,230. Lewis University had the lowest average *net tuition and fees* in period A and the University of Findlay had the lowest average *net tuition and fees* in period B. St. Olaf College had the highest *net tuition and fees* in period A and Washington University in St. Louis had the highest *net tuition and fees* in period B.

Recipient net tuition and fees increased by \$8,518 or 140%. These PNPs were less affordable to grant recipients over time. The fact *recipient net tuition and fees* grew faster than *net tuition and fees* indicated shifts in tuition discounting strategies over the period of this study. From period A to period B the average *recipient net tuition and fees* increased from \$6,063 to \$14,581. Northwestern University had the largest increase, \$22,735, and The University of Findlay had the smallest increase, \$2,071. The University of Findlay also had the lowest *recipient net tuition and fees* in period B. Northwestern University had an average *recipient net tuition and fees* in period A of \$-8,639 which rose to \$14,096 in period B making it the institution with the largest change. Since Northwestern has NCAA Division I athletic programs offering full-ride scholarships, this finding may be confounded by these large scholarships. Oberlin College had the highest average *recipient net tuition and fees* in period B, \$20,274.

Institutional grant variables.

This study included three institutional grant variables: *percentage of freshmen grant recipients, freshmen grant recipient discount rate* and *freshmen discount rate*. On average, the institutions of this study increased the *percentage of freshmen grant recipients* and decreased the *freshmen grant recipient discount rate* and *freshmen discount rate*. Overall, when comparing Period B to Period A, the institutions of this study gave less money to each individual recipient by spreading available funds across a wider pool of recipients. This findings suggests institutions did not fully adjust institutional grant budgets to meet increasing demands due to the 25% growth in *total full-time undergraduate headcount*.

The institutions of this study awarded institutional grant funds to 82.8% of the freshmen class in Period B, 10.7% higher than in period A. There are wide disparities in the *percentage of freshmen grant recipients*. In Period A, Saint Louis University awarded institutional grants to 95.9% of freshmen and University of Northwestern Ohio awarded institutional grants to only 5.6% of freshmen. In period B, Bethel University awarded institutional grants to 99% of freshmen and the University of Northwestern Ohio remained ranked the lowest for *percentage of freshmen grant recipients*, awarding grants to 16.1% of its freshmen. On average, when comparing Period B to Period A, institutions awarded institutional grants to a greater share of their freshmen.

The average *freshmen grant recipient discount rate* declined by 12.4% from period A to period B. The range of changes was -71.5% to 16.5%. Northwestern University had the largest decline and Gustavus Adolphus College had the largest increase. In period A, Northwestern University had a *freshmen grant recipient discount rate* of 135% and Cedarville University's was just 27%. In period B, the University of Notre Dame had a

freshmen grant recipient discount rate of 68% whereas the University of Northwestern Ohio's rate was just 21%. The existence of NCAA Division I athletic scholarships at both University of Notre Dame and Northwestern University impacted this finding.

From period A to period B the average *freshmen discount rate* declined by 1.5%. 17 universities increased their *freshmen discount rate*, led by the University of Findlay with a change of 20%. It had the highest *freshmen discount rate* in period B, 55%. Washington University in St. Louis experienced the largest decrease, 27%. The University of Northwestern Ohio had the lowest *freshmen discount rate* in both periods.

Interestingly, the institutions with greater dollar value changes to *institutional wealth* did not necessarily have larger increases in the *percentage of freshmen grant recipients* or *freshmen discount rate*. For instance, the University of Notre Dame's wealth increased by over \$1.4 Billion during the study but the *percentage of freshmen grant recipients* increased a modest 6.1% versus the population average of 10.7%. Also, the institution's *freshmen discount rate* decreased by 23%. Moreover, Northwestern University had increases in wealth of about \$1.4 Billion and at the same time reduced their *freshmen discount rate* by 24%. For the institutions of this study, greater wealth did not necessarily equate to greater generosity.

In summary, the study population had generally positive changes to diversity, enrollment and financial goals. This despite average population decreases in institutional grant variables of *freshmen grant recipient discount rate* and *freshmen discount rate*. In the next section, the researcher summarizes the associations between institutional grant and goal variables.

Associations between Institutional Grant and Goal Variables

What levels of association existed between the institutional grant variables and the institutional goal variables when (a) no data were adjusted; (b) differences in total full-time undergraduate headcount were controlled; (c) differences in institutional wealth were controlled?

Diversity variables.

Pearson correlations were used to assess the levels of association between each of the institutional grant and diversity variables. *Percentage of freshmen grant recipients* had a large negative association with *racial and ethnic diversity* in both periods and a medium negative association with *socioeconomic diversity* in period A. Generally, when the *percentage of freshmen grant recipients* increased, measures of diversity declined.

The associations between *freshmen grant recipient discount rate* and diversity variables were inconsistent. In period A there was a medium positive association between *freshmen grant recipient discount rate* and *racial and ethnic diversity* and this association became insignificant in period B. This indicated institutions were generally able to increase *racial and ethnic diversity* by increasing *freshmen grant recipient discount rate*, but this ability decreased over time. Also, *freshmen grant recipient discount rate* had a medium negative association with *socioeconomic diversity* in period B.

The associations between *freshmen discount rate* and diversity variables were also inconsistent, having a medium negative association with *socioeconomic diversity* in period A and medium negative association with *racial and ethnic diversity* in period B. It's counterintuitive that both discount rate variables tended to have negative associations with diversity variables. These associations were most likely confounded by the fact *net tuition* *and fees* increased at such a large rate to place negative pressures on diversity enrollment. Additional analysis to control *tuition and fees* would shed more light on this finding.

When controlling for *total full-time undergraduate headcount*, the partial association between the *percentage of freshmen grant recipients* and *racial and ethnic diversity* was less negative than the association between these variables in both periods A and B. This finding indicated that *total full-time undergraduate headcount* had a negative impact on the association between *percentage of freshmen grant recipients* and *racial and ethnic diversity*.

Generally, *percentage of freshmen grant recipients* had a large negative association with *racial and ethnic diversity* and when the positive effects of *total full-time undergraduate headcount* were controlled the association became even more negative. Despite this finding, the strategy of increasing *percentage of freshmen grant recipients* may have been used to increase enrollment of students with *racial and ethnic diversity*. For instance, Case Western Reserve University had large increases in *racial and ethnic diversity, total full-time undergraduate headcount* and *percentage of freshmen grant recipients*.

When controlling for *total full-time undergraduate headcount* the partial associations between *percentage of freshmen grant recipients* and *socioeconomic diversity* were even more negative than these associations in both periods A and B. This finding indicated that *total full-time undergraduate headcount* had a positive impact on the association between *percentage of freshmen grant recipients* and *socioeconomic diversity*. Finally, in both periods A and B, the partial association between *freshmen discount rate* and *socioeconomic diversity* was less negative than the association of these two variables. This was an indication that *total full-time undergraduate headcount* had a negative impact on the association of these variables. In summary, due to minor differences, the partial associations mentioned above do not change the aforementioned conclusions about the inconsistent associations between diversity and institutional grant variables. Although not consistent, the underlying variables tended to have medium or large negative associations even when differences in *total full-time undergraduate headcount* were controlled.

When controlling for *institutional wealth*, the associations between *percentage of freshmen grant recipients* and *racial and ethnic diversity* in both periods A and B were less negative. Also, the medium positive association between *freshmen grant recipient discount rate* and *racial and ethnic diversity* in period A declined and the medium negative association with *socioeconomic diversity* in period B became insignificant. Similarly, the association between *freshmen discount rate* and *socioeconomic diversity* became less negative and in period B became insignificant. These findings indicated that *institutional wealth* had a negative impact on each of these associations and that the institutions with greater improvements in *institutional wealth* did not improve *racial and ethnic diversity* by increasing the *percentage of freshmen grant recipients, freshmen grant recipient discount rate*.

When controlling for *institutional wealth*, the partial association between *percentage* of freshmen grant recipients and socioeconomic diversity in both periods A and B was more negative than the unadjusted association between these variables. In period A, the partial association had a larger negative association between freshmen grant recipients and socioeconomic diversity. In period B, the effect of controlling *institutional wealth* was even greater. The association between *percentage of freshmen grant recipients* and socioeconomic diversity was a non-significant value (r = -0.14) and when controlling *institutional wealth*, the resulting partial association was a significant, negative value ($r = -0.43^*$). These findings

suggest that *institutional wealth* had a positive effect, or helped mitigate the negative association between *percentage of freshmen grant recipients* and *socioeconomic diversity*. Institutions with greater changes in *institutional wealth* tended to use the increased wealth to increase the *percentage of freshmen grant recipients* and *socioeconomic diversity*.

In summary, when the *percentage of freshmen grant recipients* increased, measures of diversity decreased. These large negative associations tended to be true regardless of the *total full-time undergraduate headcount*. This finding indicated that small individual grant awards, due to a pool of institutional grant funds spread across a large group of recipients, limited the impact of the individual grant award on increasing diversity. *Institutional wealth* made a positive impact on *socioeconomic diversity*. Institutions with greater changes in *institutional wealth* tended to also have greater improvement in *socioeconomic diversity*.

Enrollment variables.

Pearson correlations were used to assess the levels of association between each of the enrollment variables and the institutional grant variables. From period A to period B, the changes in the *percentage of freshmen grant recipients* had a negative impact on several enrollment variables. For instance, increases in *percentage of freshmen grant recipients* were associated with increases in the *acceptance rate*. Also, increases in the *percentage of freshmen grant recipients* were associated with negative changes in the *admission index*, *average 75th percentile ACT score* and *total full-time undergraduate headcount*. Generally, increasing the *percentage of freshmen grant recipients* had a negative impact on enrollment variables.

With the exception of the association between *freshmen grant recipient discount rate* and *freshmen-to-sophomore retention rates*, the *freshmen grant recipient discount rate* had

mostly large associations with enrollment variables in period A and these became diluted in period B. The *freshmen grant recipient discount rate* and *freshmen-to-sophomore retention rates* had a medium association in period A and a large association in period B. On average, when compared to period A, the institutions gave institutional grants to 10.7% more students, decreased the average *freshmen grant recipient discount rate* by 12.7% and decreased the average *freshmen discount rate* by 1.5%. These percentage decreases in tuition discounting over time diluted the associations between institutional grant and enrollment variables.

Freshmen discount rate had a mix of associations over the period of the study. There were several large positive associations with enrollment variables in period A and these were either diluted or reversed by period B. Unlike period A, increases to *freshmen discount rate* in period B were associated with decreases in *admission index, average 75th percentile ACT scores,* and *total full-time undergraduate headcount.* Also, the large positive association with *completion rate* disappeared and the large positive association with *freshmen-to-sophomore retention rates* was weaker in period B. Finally, *freshmen discount rate* and *acceptance rate* had a large negative association in period A and a medium positive association in period B. Essentially, for most enrollment variables, the associations with *freshmen discount rate* became weaker over time and there are several examples of the associations changing from positive to negative in direction.

Taken as a whole, the changes in associations between institutional grant and enrollment variables indicate major shifts in strategy and market conditions over the period of this study. Institutions increased the *percentage of freshmen grant recipients* and simultaneously decreased the average *freshmen grant recipient discount rate* and *freshmen discount rate*. These changes diluted the associations between institutional grant variables and enrollment variables and in some cases the associations changed from positive to negative.

When controlling for *total full-time undergraduate headcount* the associations between institutional grant and enrollment variables changed, but only slightly in most cases. There are a few notable exceptions. First, in period A, the association between *percentage of freshmen grant recipients* and *completion rate* was not significant (r = 0.25) but became a medium negative association ($r = -0.48^*$) when controlling for *total full-time headcount*. This was also true of the change in period B when the association between *percentage of* freshmen grant recipients and completion rate was not significant (r = -0.02) and became a large negative association ($r = -0.70^{**}$) when controlling for *total full-time undergraduate* headcount. These changes indicated that changes in total full-time undergraduate headcount had a consistently positive impact on the association between *percentage of freshmen grant* recipients and completion rate. This finding logically follows from the fact the top 3 ranked institutions for improvements in *completion rate* (University of Northwestern Ohio, Columbia College-Chicago and Lewis University) were also ranked in the top 5 for increases in total full time undergraduate headcount. Similarly, John Carroll and Concordia College at Moorhead, two of the smaller institutions of this study, ranked in the bottom 5 in both completion rate and total full time undergraduate headcount. The lack of a significant association between *percentage of freshmen grant recipients* and *completion rate* may be misleading because of the overriding positive effect of *total full-time undergraduate* headcount. When the effect of total full-time undergraduate headcount was controlled, there was a large negative association between percentage of freshmen grant recipients and completion rate.

Total full-time undergraduate headcount generally had a positive impact on the associations between *freshmen grant recipient discount rate* and enrollment variables in both periods A and B. It also had a positive impact on the associations between *freshmen discount rate* and enrollment variables in both periods. Generally, *institutional wealth* had a positive effect on the associations between institutional grant and enrollment variables in both periods. In fact, when controlling for the effect of *institutional wealth* most of the associations between institutional grant and enrollment variables declined or disappeared altogether. Most striking was the fact all but one of the significant associations between *freshmen discount rate* and enrollment variables disappeared (the exception was *total full-time undergraduate headcount* in period B). Also, in period A, the partial associations between smaller and in period B the associations disappeared when controlling for *total full-time undergraduate headcount*.

In summary, institutions increased the *percentage of freshmen grant recipients* and simultaneously decreased the average *freshmen grant recipient discount rate* and *freshmen discount rate*. These changes diluted the associations between institutional grant variables and enrollment variables over the period of the study and indicated major shifts in strategy and market conditions. Generally, *total full-time undergraduate headcount* had a positive impact on the associations between institutional grant and enrollment variables. Most compelling, *institutional wealth*, which had a positive association with *total full-time undergraduate headcount* in both periods, partially explained the associations between institutional grant and enrollment wars a surrogate for institutional qualities that have attracted greater numbers of applicants, allowed

for a lower *acceptance rate*, generated a higher *admission yield*, and attracted better qualified students with greater ACT scores and better success through graduation.

Financial variables.

Pearson correlations were used to assess the levels of association between each of the enrollment variables and the financial variables. *Percentage of freshmen grant recipients* had a large negative association with *recipient net tuition and fees* in period A and medium negative associations with *institutional wealth and net tuition and fees* in period B. *Freshman grant recipient discount rate* had a large positive association with *institutional wealth* and *tuition and fees* in period A and a large negative association with *recipient net tuition and fees* in period B. *Freshman fees* in period A and a large positive association with *recipient net tuition and fees* in period B. Finally, *freshmen discount rate* had a large positive association with *institutional wealth* and *tuition and fees* and a large negative association with *recipient net tuition and fees* in period A and no significant associations with financial variables in period B. Targeted allocation of institutional grant funds had large positive association with financial variables in both periods, but the increasingly widespread allocation of institutional grants over time tended to reduce the strength of the associations in period B.

The changes in institutional grant variables had large associations with changes in financial variables. For example, the change in *freshmen grant recipient discount rate* had a large positive association with the change in *tuition and fees* and large negative associations with the changes in *net tuition and fees* and *recipient net tuition and fees*. Also, changes in *freshmen discount rate* had large negative associations with changes in *net tuition and fees*. Also, changes in *freshmen discount rate* had large negative associations with changes in *net tuition and fees*. Also, changes and *recipient net tuition and fees*. Also, changes in *freshmen discount rate* had large negative associations with changes in *net tuition and fees*.

logical and are the only occasions where associations of changes between periods A to B existed.

When controlling for *total full-time undergraduate headcount* the partial associations between institutional grant and financial variables differed from the associations in period A, but this difference virtually disappeared in period B. For example, when controlling for total *full-time undergraduate headcount* the *percentage of freshmen grant recipients* had a large positive association with institutional wealth and tuition and fees in period A whereas the original unadjusted associations were not significant. This is an indication that total full-time undergraduate headcount had a negative impact on the associations between percentage of freshmen grant recipients and each of the financial variables institutional wealth and tuition and fees. Moreover, the unadjusted association between percentage of freshmen grant recipients and recipient net tuition and fees was large $(r = 0.70^*)$ and this association changed to a large negative association ($r = -0.97^{**}$) when total full-time undergraduate *headcount* was controlled. *Total full-time undergraduate headcount* had a positive impact on the association between *percentage of freshmen grant recipients* and *recipient net tuition and* fees. The absence of the effect of total full-time undergraduate headcount resulted in a near perfect negative correlation between *percentage of freshmen grant recipients* and *recipient* net tuition and fees in period A. Then, by period B the unadjusted and adjusted associations were only slightly different. These findings indicated that total full-time undergraduate *headcount* had an impact on tuition discounting strategies in period A but no impact on tuition discounting strategies in period B.

When controlling for the effect of *total full-time undergraduate headcount* the associations between *freshmen grant recipient discount rate* and each of the financial

variables of *institutional wealth*, *tuition and fees* and *net tuition and fees* decreased in both periods A and B. This indicated that *total full-time undergraduate headcount* had a positive impact on these associations. Essentially, increases in enrollment had a positive effect on financial variables.

Most interesting was the fact that *total full-time undergraduate headcount* had a positive impact on the associations between *freshmen discount rate* and the financial variables of *institutional wealth* and *tuition and fees* in period A but no impact on the associations between these variables in period B. The *freshmen discount rate* strategies employed in period B were not associated with changes in financial variables. This may have been partly due to the fact the institutions of this study had less differentiated strategies in period B. Over time, these institutions developed similar discounting strategies despite the differences in *total full-time undergraduate headcount*.

Not surprisingly, *institutional wealth* had many effects on the associations between institutional grant and financial variables. The below paragraphs summarize the effect of *institutional wealth* by considering the changes in associations between institutional grant and goal variables when *institutional wealth* was controlled. The summary is in order of institutional grant variables, *percentage of freshmen grant recipients, recipient discount rate,* and then *freshmen discount rate*.

When controlling for *institutional wealth* the association between *percentage of freshmen grant recipients* and *recipient net tuition and fees* decreased in period A. This indicated that *institutional wealth* had a positive effect on the association between *percentage of freshmen grant recipients* and *recipient net tuition and fees*. Said another way, institutions with greater changes in *institutional wealth* tended to have greater associations between the *percentage of freshmen grant recipients* and *recipient net tuition and fees*.

The insignificant association between *percentage of freshmen grant recipients* and *tuition and fees* in period A became a medium positive association in period B. This indicated that *institutional wealth* had a negative impact on the association between *percentage of freshmen grant recipients* and *tuition and fees* in period B. Said another way, institutions with greater changes in *institutional wealth* had lower associations between *percentage of freshmen grant recipients* and *tuition and fees* in period B. These institutions increased *tuition and fees* and had small increases in the *percentage of freshmen grant recipients*.

Finally, the medium negative association between *percentage of freshmen grant recipients* and *net tuition and fees* disappeared in period B. This indicated that *institutional wealth* had a negative impact on the association between *percentage of freshmen grant recipients* and *net tuition and fees* in period B meaning institutions with greater *institutional wealth* tended to have relatively small increases in the *percentage of freshmen grant recipients* and relatively large increases in *net tuition and fees*.

When controlling for *institutional wealth* the large positive association between *freshmen grant recipient discount rate* and *tuition and fees* declined in both periods A and B. This was an indication that *institutional wealth* had a positive effect on the association between *freshmen grant recipient discount rate* and *tuition and fees* in both periods meaning that institutions with greater changes in *institutional wealth* tended to have greater associations between *freshmen grant recipient discount rate* and *tuition and fees*. Also, the large positive association between *freshmen grant recipient discount rate* and *tuition and net tuition and* *fees* in period B disappeared. This was an indication that *institutional wealth* had a positive effect on the association between *freshmen grant recipient discount rate* and *net tuition and fees* in period B meaning that institutions with greater *institutional wealth* tended to have a greater association between *freshmen grant recipient discount rate* and *net tuition and fees* in period B.

When controlling for *institutional wealth*, the large positive association between *freshmen discount rate* and *tuition and fees* decreased in period A. This was an indication that *institutional wealth* had a positive effect on the association between *freshmen discount rate* and *tuition and fees* in period A meaning the institutions with greater changes in *institutional wealth* had greater associations between *freshmen discount rate* and *tuition and fees* in period A. Also, the insignificant association between these two variables in period B became a large positive association. This was an indication that *institutional wealth* had a negative effect on the association between *freshmen discount rate* and *tuition and fees* in period B meaning the institutions with greater changes in *institutional wealth* had smaller or even negative associations between *freshmen discount rate* and *tuition and fees* in period B. This indicated the wealthier institutions increased *tuition and fees* and decreased *freshmen discount rate* at greater rates than the less wealthy institutions in period B.

Also, when controlling for *institutional wealth*, the insignificant association between *freshmen discount rate* and *net tuition and fees* in period A became a large negative association. This was an indication that *institutional wealth* had a positive effect on the association between *freshmen discount rate* and *net tuition and fees* in period A meaning the institutions with greater *institutional wealth* had greater associations between *freshmen discount rate* and *net tuition and fees* in period A. This indicated the wealthier institutions

increased *freshmen discount rate* and *net tuition and fees* at greater rates than the less wealthy institutions. Finally, when controlling *institutional wealth*, the large negative association between *freshmen discount rate* and *recipient net tuition and fees* in period A disappeared. This was an indication that *institutional wealth* had a negative effect on the association between *freshmen discount rate* and *recipient net tuition and fees* in period A meaning the wealthier institutions had lower, or more negative, associations between *freshmen discount rate* and *recipient net tuition and fees* in period A, these institutions tended to experience decreases in *recipient net tuition and fees* when *freshmen discount rate* increased. This was an indication of a strategy used by the wealthier institutions of targeting large institutional grants to a small portion of the freshmen class which drove *recipient net tuition and fees* lower for the recipients.

Summary.

Generally, as displayed in Table 68, institutional grant variables had positive associations with measures of institutional goals but the associations weakened or even reversed over time. This was partly due to the fact the population average *freshmen grant recipient discount rate* and population average *freshmen discount rate* were reduced over time. These reductions were partly due to the fact institutions increased the *percentage of freshmen grant recipients* over time. These increases in the *percentage of freshmen grant recipients* tended to reduce the size of the associations between institutional grant and measures of diversity, enrollment and financial goals. Simply increasing the number of institutional grant recipients was not an effective strategy for meeting the institutional goals examined in this study.

Table 68

Variable Number	Variable Category	Variable Name	Period	%_REC	REC_DR%	FR_DR%
1 Diversity		А	75**	.48**	11	
	Racial and Ethnic Diversity	В	68**	.32	45*	
	2		Change	02	.13	06
2 Diversity	Socioeconomic Diversity	A	40*	16	57**	
		В	14	43*	24	
		Change	.03	.20	.12	
			А	.69**	82**	65**
3 Enrollment	Acceptance Rate	В	.87**	70**	.42*	
		Change	01	.10	.09	
		Admission Yield	А	09	.02	18
4	4 Enrollment		В	36	.23	29
		Change	13	18	18	
		Admission Index	A	64**	.73**	.50**
5	Enrollment		В	85**	.69**	43*
			Change	20	28	29
		Average 75th Percentile ACT Score	A	74**	.82**	.60**
6	Enrollment		В	87**	.66**	46*
			Change	10	.76	.84
			A	.25	.60**	.57**
7 Enrollment	Completion Rate	В	02	.61**	.26	
			Change	.19	20	20
			A	49**	04	51**
8 Enrollment	Freshmen Enrollment Increases	В	06	29	14	
		Change	24	.17	.12	
9 Enrollment			A	.30	.43*	.64**
	Freshmen to Sophomore Retention Rates	В	.19	.72**	.43*	
		Change	.05	.08	.24	
10 Enrollment	Total Full-Time Undergraduate Headcount	A	21	.44*	.37*	
		В	38*	.16	37*	
		Change	.02	30	13	
11 Financial	Institutional Wealth	А	27	.76**	.61**	
		В	46*	.71**	08	
		Change	.14	.10	.20	
12 Financial	Tuition	А	03	.77**	.78**	
		В	01	.82**	.35	
		Change	08	.49**	.32	
13 Financial			Α	02	09	29
	Net Tuition and Fees	В	48**	.55**	23	
		Change	18	76**	93**	
14 Financial		ial Recipient Net Tuition and Fees	Α	.70**	97**	56**
	Financial		В	.25	08	.06
		Change	.05	92**	89**	

Summary of Correlations Between Institutional Grant and Institutional Goal Variables, by Period Correlations

**. Correlation is significant at the 0.01 level (2-tailed).*. Correlation is significant at the 0.05 level (2-tailed).

In most cases, total full-time undergraduate headcount had little impact on the associations between institutional grant and diversity variables and a small positive impact on the association between institutional grant and enrollment variables. Its impact on the associations between institutional grant and financial variables was mixed. It had a positive impact on the association of *freshmen grant recipient discount rate* and financial variables in both periods A and B and it also had a positive impact on the associations between *freshmen discount rate* and financial variables in period A, but these associations disappeared in period B. The institutions of this study, regardless of differences in *total full-time undergraduate headcount*, had consistent large positive associations between institutional grant and goal variables using targeted *freshmen grant recipient discount rate* strategies but, over time, widespread increases in *freshmen discount rate* were not associated with improvements in financial variables.

Institutional wealth had a positive impact on *socioeconomic diversity* and a negative impact on the associations between institutional grant variables and *racial and ethnic diversity*. This effect was an indication the institutions with greater improvements in *institutional wealth* did not improve *racial and ethnic diversity* by increasing the *percentage of freshmen grant recipients, freshmen grant recipient discount rate,* or *freshmen discount rate. Institutional wealth* had a substantial impact on the associations between institutional grant and enrollment variables, so much so it can be concluded that *institutional wealth* was a surrogate for institutional qualities that attracted greater numbers of applicants, allowed for lower *acceptance rates,* generated a higher admission yield and attracted better qualified students with greater standardized test scores and greater rates of success through graduation.

Institutional wealth had mixed effects on the associations between institutional grant and financial variables and in many cases the logic follows from the fact it played a role as a surrogate for institutional qualities that attracted greater student demand. For instance, the wealthier institutions tended to have greater associations between the *percentage of freshmen grant recipients* and *tuition and fees*. Over time, these institutions were able to increase net prices for a greater portion of their freshmen classes which follows the basic laws of supply and demand. These institutions also had weaker associations between *percentage of freshmen grant recipients* and *net tuition and fees* which was an indication of a strategy of targeting large institutional grants to a small portion of the freshmen class. In some cases these grants may have been used to attract the best and brightest students and in other cases they may have been used to attract students with specific talents. For example, the University of Notre Dame is well known for attracting some of the best football players who then receive full scholarships.

Wealthier institutions tended to have greater associations between *freshmen grant recipient discount rate* and the variables of *tuition and fees* and *net tuition and fees*. Over time, the wealthier institutions tended to have small increases in the *percentage of freshmen grant recipients*, large decreases in *freshmen grant recipient discount rate* and large decreases in *freshmen discount rate*. These institutions were able to increase the average net price for their freshmen classes which drove net tuition revenues higher.

The effects of *institutional wealth* on the associations between *freshmen discount rate* and the variables of *tuition and fees* and *net tuition and fees* also indicated that wealthier institutions were able to increase net prices to a larger extent than less wealthy institutions. In fact, over the period of this study, these institutions tended to have large decreases in *freshmen discount rate* and simultaneously large increases in *tuition and fees, net tuition and fees*, and *recipient net tuition and fees*. For example, three of the wealthiest institutions, University of Notre Dame, Washington University in St. Louis and Northwestern University,

had the greatest declines in *freshmen discount rate* and the greatest increases in *net tuition and fees* and *recipient net tuition and fees*. The wealth of these institutions allowed them greater ability to make strategic investments that drove student demand, net prices and net tuition revenues higher.

The Benefit of Tuition Discounting Over Time

Has the practice of tuition discounting benefited the largest 4-year PNP institutions in the Midwest?

As described in the above findings the practice of tuition discounting was associated with various diversity, enrollment and financial outcomes. To assess whether tuition discounting benefited the largest 4-year PNP institutions in the Midwest, the institutions were ranked in descending order by the percentage change in *freshmen discount rate* from time-period A to time-period B and then divided three ways into high change, medium change and low change groups to allow for comparisons between institutions with high changes in *freshmen discount rates* and institutions with low changes in *freshmen discount rates*.

The high, medium and low change categories of institutions had mean *freshmen discount rate* changes of 11.6%, 0.9% and -17.0%, respectively. The institutions simultaneously increased *tuition and fees* by 74.3%, 60.7% and 63.9%, respectively. The high change institutions practiced a high tuition, high aid strategy to a greater extent than the medium or low change institutions and none of the categories of institutions reduced *net tuition and fees*. In fact, the institutions had changes to *net tuition and fees* of 44.3%, 57.9% and 125.6%, respectively. Comparing and contrasting the institutional goal outcomes of each of the categories of institutions provides a summary of the longitudinal benefits, or lack thereof, of large increases, virtually no changes, or large decreases in *freshmen discount* *rates*. The same analysis also reveals the results of comparing a relatively large (125.6%) versus relatively small (44.3%) change in *net tuition and fees*.

Diversity variables.

From period A to period B, 17 institutions increased *freshmen discount rate* and all but one (University of Findlay) also increased *racial and ethnic diversity*. Similarly, 14 of the institutions with increases to *freshmen discount rate* (University of Dayton, Drake University and Cedarville University were the only exceptions) experienced a simultaneous increase in *socioeconomic diversity* over the period of this study.

The high, medium and low change institutions increased *racial and ethnic diversity* by 7.2%, 1.3% and 7.5%, respectively. The changes experienced by the high and medium change institutions are similar to the findings of Lasilla (2010) who reported that tuition discounting can have a positive effect on *racial and ethnic diversity* in the short-term. The low change institutions had the highest levels of racial and ethnic diversity in both periods A and B and experienced the greatest gain in racial and ethnic diversity despite a large decrease in *freshmen discount rate*. These results are similar to Redd's (2000) finding that institutions with lower growth in tuition discounting increased enrollment of under-represented students by 11%. The large improvement by the low change institutions may have been partially due to the pre-existence of a more diverse student body and/or the pre-existence of effective diversity recruiting and enrollment strategies. Each category of institutions under-performed the national average for improvements in *racial and ethnic diversity* of about 12% during this time period (Snyder & Dillow, 2013, Table 264). Moreover, the overall average rate of *racial* and ethnic diversity in period B (26.6%) lagged behind the national average rate of 35.5% at all 4-year PNP's.

The high, medium and low change institutions also increased *socioeconomic diversity* by 2.1%, 4.5% and 0.3%, respectively. In period B, the study population averaged *socioeconomic diversity* of just over 23%. The increases in *socioeconomic diversity* and the study population average trail Brunt's (2014) findings that between 2000 and 2010, the *socioeconomic diversity* enrollment rate at all 4-year PNPs increased by over 9% from about 32% to about 41%. The low change institutions had the lowest levels of *socioeconomic diversity* at the low change institutions may have been partially due to the high increases in *net tuition and fees* of over 125% during the study period. Most likely, these institutions were unaffordable for some lower income families.

Across all institutional change categories there was only one significant association between changes in institutional grant and changes in diversity variables. For the medium change institutions the increase in *freshmen grant recipient discount rate* had a large association with the increase in *racial and ethnic diversity*. Lasilla found (2010) that tuition discounting has no long-term impact on enrollment of Black and Hispanic students. Similarly, the findings of this study indicated that a general strategy to increase *freshmen discount rates* may not be associated with improvements in diversity over the long-term.

Enrollment variables.

Despite the high increase in *freshmen discount rate* the high change institutions had modest improvements to most enrollment variables. For instance, the high change institutions lowered *acceptance rate* by 5.2%, which was a smaller improvement than the medium or low change institutions. Also, the high change institutions had small improvements in *completion* *rate* and *total full-time undergraduate headcount*. The exception was the fact the high change institutions had the greatest improvement in *freshmen-to-sophomore retention rates*.

The low change institutions had the greatest change to a few of the enrollment variables. For example, the low change institutions had the smallest decline in *admission yield*, and the greatest improvement in *admission index* and *average 75th percentile ACT score*. Finally, the medium change institutions had the greatest improvement in *acceptance rate, completion rate* and *total full-time undergraduate headcount*.

When considering each institutional change category there were only a few significant associations between changes in institutional grant and changes in enrollment variables. *Percentage of freshmen grant recipients* had no significant associations with enrollment variables. The high change institutions had a large association between changes in *freshmen grant recipient discount rate* and changes in *average 75th percentile ACT score*. This finding is similar to Avery, Hoxby and Metrick's (2004) finding that high ability students responded to price changes in a rational manner. These institutions also had a large association between changes in *freshmen discount rate* and changes in *freshmen-to-sophomore retention rates*, which is in line with the findings of many previous studies (Alon, 2011; Wei, & Horn, 2002; D, Ahlburg, & McCall, 2004; Dowd, 2004; Gross, Hossler, & Ziskin, 2007; Heller, 2003; Horn, Peter & Carroll, 2003; Kerkvliet & Nowell, 2004; Light & Strayer, 2000; Paulsen & St. John, 2002; St. John, Hu, & Weber, 2001) High change institutions were able to improve the academic profile and persistence rates and these improvements were associated with *freshmen discount rates*.

The medium change institutions had large negative associations between changes in *freshmen grant recipient discount rate* and changes in each of the variables *completion rate*,

freshmen-to-sophomore retention rates and *total full-time undergraduate headcount*. The medium change institutions had improvements in each of these enrollment variables despite the fact they had decreases in *freshmen grant recipient discount rate*. In fact, compared to the high and low change categories, medium change institutions had the greatest improvement in *completion rate* and *total full-time undergraduate headcount*. It seems counter-intuitive that there was a negative association between these institutional grant and enrollment variables, but the findings are similar to those of Alon (2011) who found that tuition discounts had no impact on persistence rates for families in the top 2 quartiles of income. In fact, of the traditional aged students from the top income quartile who began college in 2011, 87.3% were expected to complete a Bachelor's degree by age 24 (Mortensen, 2012). This compared to about 24% for the bottom two quartiles (Mortensen, 2012). Students from the top two income quartiles are less price sensitive and have greater choice to attend and persist for non-price factors.

Finally, the low change institutions had large associations between changes in *freshmen grant recipient discount rate* and changes in *total full-time undergraduate headcount* and between changes in *freshmen discount rate* and changes in *total full-time undergraduate headcount*. In addition, despite the fact the low change institutions reduced *freshmen grant recipient discount rate* and *freshmen discount rate*, several measures of enrollment improved. These changes suggest these institutions could have improved measures of enrollment even further if they would have slowed the decreases in tuition discounting.

In summary, there were improvements to several enrollment variables at medium and low change institutions despite the fact these institutions decreased average discount rates and had substantial increases in *net tuition and fees* of 57.9% and 125.6%, respectively. These findings contradict pure public choice theory (Ostrom & Ostrom, 1971) and the assumption that students will choose to attend the college or university offering the lowest price (Winston & Zimmerman, 2000). These findings are also an indication that these institutions have attracted students with generally low price sensitivities.

Financial variables.

In both periods A and B, mean *institutional wealth* had an inverse relationship with the ranking of *freshmen discount rate* change categories. That is, the high change institutions had the smallest mean dollar value of *institutional wealth* and the low change institutions had the greatest mean dollar value of *institutional wealth*. But, the percentage change in *institutional wealth* followed the ranking of *freshmen discount rate* change categories. The high change institutions had the greatest percentage change in *institutional wealth* and the low change institutions had the greatest percentage change in *institutional wealth* and the low change institutions had the smallest percentage change in *institutional wealth*. The high change institutions also had the largest change in *tuition and fees*. The low change institutions had the largest change in *net tuition and fees* and *recipient net tuition and fees*. Despite the low percentage change in *institutional wealth* by the low change institutions, they had much greater dollar value increases during the study period. This large change in *institutional wealth* was partly due to their ability to increase net tuition revenues during this period.

Low change institutions had a large positive association between the change in *freshmen discount rate* and the changes in *tuition and fees* and a large negative association between changes in *freshmen discount rate* and changes in *institutional wealth, net tuition and fees* and *recipient net tuition and fees*. For the high and medium change institutions the
increases in *freshmen discount rate* were not associated with changes in *institutional wealth* or *tuition and fees*. Also, the modest increases in *freshmen discount rate* for the medium change institutions were not associated with changes in any financial variables. The high change institutions had large negative associations between *freshmen discount rate* and both *net tuition and fees* and *recipient net tuition and fees*.

All categories of institutions had increases in *net tuition and fees* and *institutional wealth*. The high change institutions had the greatest percentage increases in *institutional wealth* despite the lowest percentage increase in *net tuition and fees*. These findings are similar to earlier empirical evidence reporting lower net tuition prices to produce additional revenues for institutions (Avery & Hoxby, 2003; Bowen, Kurzwell, Tobin, & Pichler, 2005; Heller, 1997).

The increase in *percentage of freshmen grant recipients* for medium change institutions had a large positive association with the increase in *recipient net tuition and fees*. For these institutions, the modest increase in *freshmen discount rate* may have been spread across too many students to effectively reduce *recipient net tuition and fees*. There were no other associations between the changes in *percentage of freshmen grant recipients* and the financial variables. These findings, or lack thereof, suggest that all institutions could improve outcomes by allocating discounts to incentivize enrollment and net tuition revenues more strategically.

For the high change institutions, the increase in *freshmen grant recipient discount rate* had a large negative association with *recipient net tuition and fees*. These institutions had large enough changes in *freshmen grant recipient discount rate* to effectively reduce *recipient net tuition and fees*. For the medium change institutions, changes in *freshmen grant* *recipient discount rate* had a large positive association with changes in *tuition and fees*. This was an indication these institutions were effectively practicing a high tuition, high aid strategy. Finally, for the low change institutions, changes in the *freshmen grant recipient discount rate* had large negative associations with changes in *net tuition and fees* and *recipient net tuition and fees*.

Conclusions and Recommendations

Conclusions

The practice of tuition discounting was associated with various positive changes in diversity, enrollment and financial outcomes over the period of this study. The population of institutions experienced improvements to all diversity, enrollment and financial variables with only a few exceptions. The average *acceptance rate, admission yield* and *admission index* all decreased which indicated an increasingly competitive environment in which students exercised greater choice and selectivity when considering institutions. Enrollment was consistently strong but there was increasing pressure on *freshmen enrollment increases* as evidenced by a slight decrease in this variable from period A to period B. Consistent enrollment growth had a positive effect on financial variables.

Some outcomes differed when the institutions were compared across institutional change categories. The high change institutions were able to improve diversity, enrollment and financial outcomes. Using a high tuition, high aid strategy these institutions competed for students on the basis of setting lower *net tuition and fees*. This strategy led to some improvements, but the high changes to *freshmen discount rate* did not always result in the greatest improvement in institutional goal variables. These institutions had the greatest improvement in *freshmen enrollment increases* and *freshmen-to-sophomore retention rates*.

They also had the greatest improvement in the percentage changes in *institutional wealth* and *tuition and fees*.

Meanwhile the low change institutions competed for students on the basis of selectivity (as measured by lower *acceptance rates*, higher *admission yield* and higher *admission index*) and *institutional wealth*, which was a surrogate for institutional prestige. These institutions were able to increase *net tuition and fees* by 125% and at the same time achieve lower *acceptance rates*, higher *admission index* scores, higher *average* 75th *percentile ACT scores*, higher *completion rates*, higher *freshmen to sophomore retention rates*, and higher *total full-time undergraduate headcount*.

With a moderate tuition discounting strategy, the medium change institutions also had improvements in diversity, enrollment and financial variables. Despite an average decrease in *freshmen grant recipient discount rate* and only a 0.9% increase in *freshmen discount rate*, these institutions had the greatest improvements in *socioeconomic diversity, acceptance rate, completion rate* and *total full-time undergraduate headcount*.

The tuition discounting strategies employed during the period of this study had mixed financial results. When controlling for *total full-time undergraduate headcount* the *freshmen discount rate* strategies employed in period B were not associated with changes in financial variables. This may have been partly due to the fact the institutions of this study had less differentiated strategies in period B. Over time, these institutions developed similar discounting strategies despite the differences in *total full-time undergraduate headcount*. A lack of differentiation across the population may have diluted the effects of tuition discounting over time. Low change institutions increased *net tuition and fees* and simultaneously improved diversity, enrollment and financial outcomes. The high change institutions also experienced improvements but were not able to increase *net tuition and fees* to the same extent. In fact, in inflation-adjusted dollars, the high change institutions increased *net tuition and fees* by an average of just over \$1,300 per student and *institutional wealth* by an average of \$145.3 million. Meanwhile, the low change institutions increased inflation-adjusted *net tuition and fees* by an average of nearly \$9,000 per student and *institutional wealth* by an average of \$791.1 million. In just 10-years, low change institutions improved *institutional wealth* 5 times greater than their high change competitors. These results demonstrate the potential pitfalls associated with tuition discounting strategies and highlight the dramatic and rapid impact of different strategies over a short time period of just about 10 years.

It is more difficult for administrators to change longer term non-financial factors such as academic program enrichment, faculty development, physical campus renovations and perceptions of institutional value and prestige, therefore, administrators will most likely continue shorter term attempts to alter outcomes through the use of various tuition discounting strategies. A recent research briefing, *Future Students: Future Revenues, Thriving in a Decade of Declining Demographics* challenges the sustainability of the strategies from the past decade (Education Advisory Board, 2013). The authors write:

Over the past decade, universities were able to grow revenue primarily by growing enrollment and increasing net tuition per student. But demographic and economic changes will make it increasingly difficult for all but a handful of institutions to grow tuition revenue at historic rates. Many will struggle simply to grow net revenue at the rate of inflation. (Education Advisory Board, 2013, p. 1)

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The findings of this study indicated a decline in the associations between institutional grants and the achievement of institutional goals, especially for the less wealthy institutions.

This study has shown that over the short period of 10 years, tuition discounting strategies had varying effects on net revenues. The associations between institutional grants and measures of institutional goals have declined over time. Rising tuition and stagnant tuition discounts have caused these institutions to become less affordable and cumulative student loan borrowing through graduation has increased to a national average of \$32,300 at 4-year PNPs (Reed & Cochrane, 2013, p. 1). These trends occurred while *institutional wealth* increased at astounding levels. Many of these non-profit institutions have increased their financial positions and at the same time priced themselves out of the market for certain student segments, like lower income families.

The primary findings of this study can be summarized in five conclusive statements: 1) different levels of institutional grants have had different levels of associations with measures of institutional goals and *institutional wealth* had a substantial impact on these associations, 2) higher discounts were not generally associated with greater improvements in the attainment of institutional goals, 3) associations between institutional grants and measures of institutional goals have decreased over time, therefore, the ability to achieve institutional goals through the use of institutional grants is eroding, 4) *total full-time undergraduate headcount* had little impact on the associations between institutional grant and institutional goal variables, suggesting the findings are consistent across a range of institutions as measured by enrollment 5) *tuition and fees* and *institutional wealth* have grown at substantial rates, yet the population lagged the national average improvements in *racial and ethnic diversity* and *socioeconomic diversity* at all 4-year PNPs.

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Recommendations

Administrative recommendations.

The primary findings of this study lead to five administrative recommendations: 1) institutional administrators should determine their overall *freshmen discount rate* based on their unique value proposition; 2) institutional administrators should understand both financial and non-financial factors influencing application volume and *admission yield;* 3) institutional administrators should establish segmented net price and net revenue goals that supersede the focus on a singular institutional tuition discount goal; 4) institutional administrators should develop analytic capacity to drive a mass-customization strategy that tailors the recruiting process and establishment of net price for meeting the needs and expectations of each student; 5) high-tuition, high-aid pricing is being challenged and new pricing models should be considered. A summary of each of these recommendations follows.

The associations between institutional grant and institutional goal variables were found to vary and were not linear. This finding highlights the difficulty of establishing appropriate *freshmen discount rates* in competitive markets. To maximize revenues, institutional administrators should understand and articulate the unique value proposition of their own institutions as well as carefully assess and leverage market data when establishing competitive *freshmen discount rates*. For example, *institutional wealth* had a significant impact on the associations between institutional grant and enrollment variables. The wealth of these institutions allowed them greater ability to make strategic investments that drove student demand. Over time, the wealthier institutions were able to increase net prices for a greater portion of their freshmen classes which followed the basic laws of supply and demand and led to greater levels of net revenues. Institutional administrators should establish their overall *freshmen discount rate* based on their unique value proposition and market position and use competitive factors like *institutional wealth* to help inform their strategies.

Higher tuition discounts did not necessarily equate to greater improvements in the attainment of institutional goals. These findings suggest other, non-financial factors have impacted enrollment, persistence and completion outcomes as well as net tuition revenues at institutions. Administrators should not use a simple, limited dimension, linear approach when establishing net prices; rather, decisions should be based on the multitude of effects of financial and non-financial factors.

The above two recommendations lead to a third recommendation: institutional administrators should use segmented, multi-dimensional data analytics to establish individualized net prices when making decisions about the allocation of institutional grants. The aggregation of micro-segmented, individualized net prices to meet institutional net revenue goals should supersede the superficial exercise of managing a singular discount rate. This is evidenced by the lack of association between *percentage of freshmen grant recipients* and measures of institutional goals. An approach to simply give institutional grants to more students in order to attain institutional goals is unfounded. Rather, by strategically managing the wide variety of price sensitivities of each student, institutions have a greater likelihood of meeting a range of diversity, enrollment and financial goals.

The above recommendations of a) establishing clear value propositions, b) understanding both financial and non-financial factors impacting net price, and c) establishing segmented net price, hinge on the ability of administrators to deeply understand issues of benefits and price. Understanding these issues deeply enough and significantly better than competition requires more management time and effort than typically assumed (Lanning & Michaels, 1988). It most often requires quantitative market analysis, systematically listening to students and parents throughout the recruitment cycle to understand their needs and desires, analyzing and reanalyzing real market behaviors and test marketing new benefit and price scenarios (Lanning & Michaels, 1988). Therefore, institutional administrators should develop analytic capacity to establish effective masscustomization strategies that effectively and efficiently tailor the recruiting process and establishment of net price for each student based on their unique set of financial and nonfinancial factors. Through the use of advanced data collection and data mining techniques, institutions can better align information and messages about their value propositions with the unique needs and desires of prospective students to drive greater achievement of institutional goals. The associations between institutional grants and measures of institutional goals have declined over time. Rising tuition and stagnant tuition discounts have caused these institutions to become less affordable and cumulative student loan borrowing through graduation has increased to a national average of \$32,300 at 4-year PNPs (Reed & Cochrane, 2013, p. 1). These trends occurred while *institutional wealth* increased at astounding levels. Many of these non-profit institutions have increased their financial positions and at the same time priced themselves out of the market for certain student segments, like lower income families. The practice of setting a high price and then attempting to meet institutional goals through the use of institutional grants began having less positive effects toward the end of the study and has come into common question in recent years.

A June 2014 survey of 430 business officers from a national sample of 4-year institutions, including over 200 4-year PNPs, revealed several findings related to shifting attitudes about tuition discounting practices (Jaschik & Lederman, 2014a). As examples,

61% of the respondents from 4-year PNPs were not confident in the sustainability of their institution's financial model over the next 10 years; 89% indicated that their institution recently had emphasized enrollment management; 77% indicated that their institution recently had emphasized ways to increase net revenues; 70% believe or are not sure the current levels of tuition discounting are sustainable; 67% either do not believe or are not sure their institutions have the appropriate levels of information to measure the efficacy of academic programs. Moreover, a recent survey of over 400 college presidents indicated the most common strategy for reducing prices was to increase revenues through fundraising or other revenue generating programs (Jaschik & Lederman, 2014b). Reducing costs was listed as a much less common strategy.

This study did not consider the actual cost of providing education nor did it explore the rationale or policies for establishing reasonable levels of reserves. Therefore, associations among the costs of providing education, reserve policies and net prices remain unclear. Nevertheless, it is clear that some institutions have become increasingly wealthy as a result of students paying higher prices. This condition is having an immediate impact on students and it may have a longer term impact on institutions. Institutions should consider the effects of establishing cost containment or reduction strategies as well as reserve policies for minimizing price increases that negatively affect students and could negatively affect longer term attainment of institutional goals. Efficiencies in operations and cost containment considerations like classroom utilization rates, shared services among administrators, faculty loads, profitability of academic programs and others should be seen as integral to efforts to increase net revenues that allow for continuous investments in the institutions.

Recommendations for further research.

In this study, associations between *institutional wealth*, institutional grant and enrollment variables were difficult to analyze because of vast differences in *institutional wealth*. Future studies on this topic should include a defined population of institutions with similar levels of *institutional wealth*.

This study used a population of institutions with a wide range of *acceptance rates* which implied a wide difference in institutional selectivity. To better understand the association of institutional grants and measures of institutional goals, a future study with a defined population limited to institutions with similar *acceptance rates* could yield especially informative results.

Aggregating data at the institutional level does not allow for conclusions about the effects of institutional grants on individual students or segments of students. There is already empirical evidence that different types of students respond to discounts differently. The effects have been found to differ across family income bands as well as average standardized test score bands (Avery, Hoxby, & Metrick, 2004; St. John, 1990). Therefore, future studies should explore the effects of tuition discounting strategies on individual students or segments of students.

This study used all types of institutional funded tuition discounts. Some of the institutions participate in NCAA Division I athletics and offer athletic scholarships which in some cases cover the full cost of tuition, room and board. As a result, athletes will often use primarily non-financial factors when considering their choice for college. Further study should remove athletic aid and athletic aid recipients from the institutional grant and institutional goal variables.

Institutional wealth had a significant impact on the associations between institutional grant and goal variables. This study defined *institutional wealth* as the fiscal year end total asset value divided by the number of freshmen. The total asset value was defined as the sum of cash, cash equivalents, and temporary investments; receivables; inventories, prepaid expenses, and deferred charges; amounts held by trustees for construction and debt service; long-term investments; plant, property, and equipment; and other assets. As such, the definition does not include debt obligations or other liabilities. Due to the variety of strategies for the use of short and long-term debt, a study that defines *institutional wealth* using a net asset figure that accounts for short and long-term debt may lead to different and important conclusions about the associations between institutional grant and goal variables.

Finally, this study did not consider the cost of providing education. A study exploring associations between the cost of providing education and net *tuition and fees* would be beneficial. Such a study should consider the association between the cost of education and the attainment of institutional goals. Currently, administrators use tuition discounting strategies as the most readily available lever for influencing net price and achieving institutional goals. The sustainability of this lever is in question. Further study may reveal that reducing or containing costs is the logical next lever for achieving desired outcomes.

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APPENDIX A

Institution, state, average full-time, fall term undergraduate enrollment, 2001 through 2010, % of undergraduate population 18-24 years of age and discount rate change category, ordered descending by average full-time undergraduate enrollment

		Average		Discount Rate
Institution Name	State	Enrollment	% aged 18-24	Category
DePaul University	IL	11623	92	Medium Change
Columbia College Chicago	IL	10319	87	Low Change
University of Notre Dame	IN	8388	100	Low Change
Northwestern University	IL	8537	90	Low Change
Loyola University Chicago	IL	9195	91	Low Change
Marquette University	WI	7704	96	Medium Change
University of Dayton	ОН	7028	95	Medium Change
Saint Louis University	МО	6306	94	Low Change
Washington University in St Louis	МО	6210	88	Low Change
University of St Thomas	MN	5866	94	High Change
Bradley University	IL	4734	97	High Change
University of Chicago	IL	5140	97	Low Change
Calvin College	MI	3838	96	High Change

Case Western Reserve University	ОН	4090	96	Low Change
Butler University	IN	3670	97	Medium Change
Xavier University	ОН	3786	87	Medium Change
John Carroll University	ОН	2906	96	High Change
Baldwin Wallace University	ОН	2914	95	Medium Change
Hope College	MI	3114	96	Medium Change
St. Olaf College	MN	3028	98	High Change
Drake University	IA	3326	93	Medium Change
Cedarville University	ОН	2840	94	High Change
Valparaiso University	IN	2733	93	Medium Change
Oberlin College	ОН	2860	96	Low Change
Lewis University	IL	2454	90	Low Change
Concordia College at Moorhead	MN	2740	98	High Change
The University of Findlay	ОН	2709	87	High Change
Bethel University	MN	2693	96	High Change
University of Northwestern Ohio	ОН	2599	90	Medium Change
Gustavus Adolphus College	MN	2501	99	High Change