

## ABSTRACT

Title of Dissertation: EXAMINING THE STATUS OF EQUITY IN UNDERGRADUATE ENROLLMENTS FOR BLACK, LATINO AND LOW-INCOME STUDENTS AT PUBLIC FOUR YEAR UNIVERSITIES AND FLAGSHIP CAMPUSES

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This study extends prior research (e.g., Bensimon, Hao & Bustillos, 2006; Perna, et al., 2006) that has examined postsecondary access and equity in enrollments for underrepresented student groups. Descriptive statistics are used to examine the status of equity in undergraduate enrollments for Black, Latino and low-income students, as well as trends in the status of equity for these groups from 1994 to 2004, at public flagship campuses and at other public four-year universities. Multivariate regression analyses are used to test the study's conceptual model which explores whether a relationship exists between variables shaped by human capital and institutional isomorphism, and institutions' equity indices. This study advances understandings of the degree to which the public four-year sector is adequately enrolling students from underrepresented groups, the relationship between institutions' flagship status and the enrollment equity indices for various groups of, the relationship between the pursuit of prestige and equity in undergraduate enrollments, and how variables within institutions' purview of control are related to their enrollment equity indices.

The study's findings suggest that Black, Latino and low-income students do not achieve equity in undergraduate enrollments at public four-year universities or flagship campuses in a majority of states. In most states, Black and low-income students are more

likely to achieve equity at public four year universities than at flagships, while Latinos are more likely to achieve equity at flagship campuses than at other public four-year universities. Of all three student groups, however, low-income students are most likely to be underrepresented in undergraduate enrollments at both public four-year universities and flagship campuses.

The descriptive analyses also show that, over a 10-year period, the enrollment equity indices for Black and Latino students have decreased at public four-year institutions and flagship campuses in a majority of states. Conversely, the enrollment equity indices for low-income students increased at public four-year and flagship universities in a majority of states during the same time period. However, despite the upward trend in the enrollment equity indices for low-income students, in 2004 this group achieved equity at public four-year universities in only five states and at the public flagship university in only one state.

The results of the multivariate analyses suggest that a relationship exists between human capital and institutional isomorphism variables, and the enrollment equity indices for Black, Latino and low-income students. The analyses also reveal a statistically significant negative relationship between institutions' flagship status and their enrollment equity indices for Black and low-income students, but not for Latino students.

The study's findings have implications for policy, practice and research. Specifically, the findings underscore the need to examine the status of equity within state-specific contexts, and to calculate separate equity indices for different institutional sectors. The study also identifies several directions for future research.

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FOR BLACK, LATINO AND LOW-INCOME STUDENTS AT PUBLIC FOUR-YEAR  
UNIVERSITIES AND FLAGSHIP CAMPUSES

by

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## DEDICATION

To my mom~  
my real life super hero

and

My sister~  
my guardian angel

*With all my love and gratitude*

## ACKNOWLEDGEMENTS

Completing this dissertation has been a long journey during which I have learned many important lessons. The first of which is that you cannot complete a task such as this alone. In that regard, I give thanks to the Lord Jesus Christ for sustaining me through this endeavor. God is so faithful, His grace is sufficient, and His mercy endureth forever.

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walked beside me as I finished this dissertation, and for the calming spirit that he has brought to my sometimes chaotic life. I will always remember the many ways that he has shown his support, concern and love for me during this time, and will continue to be especially grateful for all of the responsibilities that he cheerfully assumed (proofreader, editor, computer technician, data checker, chauffeur, library partner) to help me complete this monumental undertaking.

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# CHAPTER 1

## INTRODUCTION

### Introduction

It is a widely held belief that higher education is a worthwhile investment, and the individual and societal benefits associated with attaining a baccalaureate degree are well documented (College Board, 2005; Institute for Higher Education Policy [IHEP], 2002; Mortenson, 2000; Pascarella & Terenzini, 2005). To this end, more Americans than ever before are currently pursuing some form of postsecondary education, and the college-going rates of recent high school graduates of all backgrounds have increased considerably over the last 30 years (National Center for Education Statistics [NCES], 2006a; NCES, 2006b).

Yet, despite increased college enrollment rates and widespread assumptions that attending college and earning at least a bachelor's degree are important, substantial disparities exist in the college-going rates of members of different racial and ethnic groups and income levels. More specifically, the college participation rates of African Americans and Latinos are lower than those of their White and Asian peers (Harvey & Anderson, 2005). Likewise, the college-going rates of students from low-income families lag behind the enrollment rates of individuals from middle and upper-income households (Adelman, 2004; IHEP, 2006; NCES, 2006b).

Inequities in educational opportunity are also evidenced by differences in the types of colleges and universities attended by various groups of students. Research suggests that African Americans, Latinos and low-income students attend community

colleges, for-profit institutions, and less-selective four year institutions at higher rates, and more selective four-year public and private institutions at lower rates, than their White, Asian and higher-income counterparts (Astin & Oseguera, 2004 ; IHEP, 2002; Mortenson, 2005; Nora, 1993). Because a range of outcomes, including variations in earnings and graduate school enrollment rates, are associated with attending various types of postsecondary institutions, differences in the college destinations of Black, Latino and low-income students, when compared to those of their White, Asian and higher-income counterparts, are worth examining (Lang, 1987; Pascarella, Smart, Stoecker, 1989; Zhang, 2005).

Carnevale and Fry (2002) assert that, “Demography is the most powerful determinant of the future of higher education” (p. 137). This premise is supported by the fact that over the last three decades the composition of the country’s high school graduates, who comprise the largest proportion of new college students, has changed considerably. In 1974, 84% of high school graduates were White and 14% were African American or Latino. By 2002, the population of high school graduates had become more diverse, with Whites accounting for only 67% of graduates and the share of African American and Latino graduates increasing to 24% (NCES, 2006c).

Given the on-going shift in the racial and ethnic make-up of the high school graduate population, it is not surprising that the profile of students who enroll in the nation’s colleges and universities is expected to continue to change as well. By the year 2015, the traditional college-age population is projected to increase from 26 million to 30 million individuals (Carnevale & Fry, 2002). Although Whites will continue to account for the majority of all college students, the proportion of Whites attending college is

expected to increase by only 4.4% (from 17.5 million to 18.3 million) while Black college students are projected to increase by 18% (from 3.75 million to 4.4 million) and Latino students are slated to increase by 56% (from 3.7 to 5.8 million) during the same time frame (Campbell, 1996; Western Interstate Commission for Higher Education, 2003).

### Overview of Existing Research

The passage of the Service Members Readjustment Act of 1944, more commonly referred to as the GI Bill, and the enactment of the Higher Education Act (HEA) of 1965 signaled the beginning of an era of unprecedented access to the nation's postsecondary institutions. Since these pieces of legislation were ratified the number of Americans who have joined the ranks of the college educated has increased considerably (Fitzgerald & Delaney, 2002). For example, in 2003 more than 17 million students matriculated at American colleges and universities (NCES, 2006). This is six times more than the number of students who enrolled in college in 1950 and ten times greater than the number of pre-World War II matriculants (Gladieux, 2002).

Although the college participation rates of all racial and ethnic groups have increased significantly over the last 50 years, marked inequities exist between the rates at which African Americans, Latinos and low-income students enroll in college and the rates at which their White and economically advantaged peers participate in higher education. In 2002, nearly half of White high school graduates (47%) between the ages of 18 and 24 enrolled in college, compared with only 40% of Blacks and 32% of Latinos (Harvey & Anderson, 2005). The college-going rates for recent high school completers



revealed smaller gaps between groups, with 69% of White students enrolling in college immediately after graduating, compared with 63% and 62% of Blacks and Latinos, respectively. Although these enrollment gaps appear relatively small, they are wider today than they were in 1974 when the enrollment rates for all three groups stood at 47% (NCES, 2006). According to Carnevale's (1999) estimates, an additional \$230 billion would be added to the country's wealth, including \$80 billion in new tax revenue, if African-American and Latino students enrolled in and graduated from college at the same rates as their White peers. Carnevale also suggests that the proportion of Black and Latino families living on inadequate incomes would decrease from 41% to 21%, and from 33% to 24%, respectively, if young people from these groups were provided with the opportunity to enter and earn degrees from postsecondary institutions at the same rates as their White counterparts.

While gaps in the college-going rates of different racial and ethnic groups have increased over time, the college participation rate gap between high and low-income students has decreased during the same time frame. In 1973 there was a 44 percentage point gap between the 20% college enrollment rate of recent high school graduates from low-income families and the 64% enrollment rate of students from high-income families, but by 2004 that gap had narrowed to 29 percentage points (NCES, 2006). However, despite some progress, in 2004, 79% of the most economically advantaged students (those from families whose annual earnings were more than \$78,666 and placed them in the top 20% of all family incomes) attended college, compared with 50% of the most economically disadvantaged students (those from families who earned less than \$16,394 annually and were in the bottom 20% of all family incomes).

Mortenson (2000) argues that “there is no simpler, more direct, or more important determinant of human welfare today than educational attainment” (p. 38). This statement is confirmed by research findings that suggest that for most students the benefits of acquiring a postsecondary degree far outweigh the costs necessary to obtain it. Adam Smith (1952) and other early economists asserted that education provided direct and indirect benefits to the individual recipient, as well as to the society to which he or she belonged. The most widely cited and long-standing personal advantages associated with attaining a college degree are increased earnings and employment related benefits, and this finding has been substantiated for the past several decades. Over 20 years ago, O’Neil and Sepielli (1985) found that in 1979 the total lifetime earnings differential between completing high school and earning a bachelor’s degree was \$376,958. The 1999 lifetime earnings estimates also project that bachelor’s degree recipients would earn an average of \$2.1 million, or 75% more, than high school diploma holders (Chessman-Day & Newburger, 2002). Additionally a study by the College Board (2006) reports that today, annual earnings differentials between high school and college graduates range from \$13,900 for 25 to 34 year olds to \$22,900 for individuals between the ages of 45 and 54.

While increased levels of educational attainment are associated with higher salaries, human capital theory posits that economic benefits that are correlated with bachelor’s degree attainment may also be influenced by other variables. Background characteristics, elementary and secondary schooling experiences, ability, motivation and maturity levels may also affect individuals’ long-term outcomes, including personal earnings (Becker, 1993; Bowen, 1997). However, despite these rival explanations, some

studies suggest that significant earnings differentials persist between college graduates and those with no postsecondary education, and between bachelor's degree holders and those with some college who earned less than a bachelor's degree. For example, Perna (2005) found that after controlling for sex, race/ethnicity, socioeconomic status and standardized test score variables, the annual earnings of bachelor's degree recipients were 19% higher than the incomes of high school graduates who did not attend college.

In addition to the economic returns associated with completing college, numerous non-monetary private and public benefits are correlated with increased levels of education. Personal non-economic benefits include better health and well-being and enhanced social networks, while societal benefits include decreased levels of crime and unemployment and increased levels of civic engagement (College Board, 2005; IHEP, 2006; Pascarella & Terenzini, 2005). Additionally, Bowen (1997) argues that the single most important benefit of higher education is the intergenerational impact that advanced educational attainment is likely to have on the degree holder's children. Other researchers concur with the assertion that the intergenerational effects of advanced education are powerful, and that children are more likely to aspire to attend college and attain a bachelor's degree or higher if their parents possess a postsecondary degree (Cohn & Geske, 2004).

While the data clearly suggest that the attainment of a postsecondary degree yields substantial monetary and non-monetary rewards to the individual beneficiary as well as to society as a whole, the higher education literature acknowledges that the type and level of selectivity of the institution a person attends is also correlated with the long-term benefits he or she is likely to accrue. According to Gladieux (2002), "the reality is

that students attending less than four-year schools reap lower socio-economic rewards on average than those who end up with a bachelor's degree or more" (p. 47). Despite this assertion, a large share of students of color and low-income students enroll in community colleges and proprietary institutions. In 2002, approximately half of Black college students, and nearly two-thirds of Latino college students, matriculated at two-year institutions, compared to only 43% of Whites (Mortenson, 2005). Further, the proportion of Black and Latino students who enrolled in community colleges over the ten-year period from 1991 to 2001 increased while the proportion of White students attending these institutions decreased. Students of color also tend to be disproportionately represented among students in for-profit colleges and universities. A recent report by the Institute for Higher Education Policy (2006) found that Blacks (13%) and Latinos (12%) were twice as likely as Whites (6%) to attend proprietary institutions.

Like African-American and Latino students, low-income students are also more likely to attend community colleges and less selective four-year institutions than their higher-income peers, and today they are also more likely to attend two-year institutions than they were in the past. An examination of the institutional destinations of Pell Grant recipients, the financial aid tool reserved for the most economically disadvantaged students, found that in 1974, 62% of Pell recipients attended four-year public and private institutions while only 38% enrolled at two-year colleges (Mortenson, 2005). By 2004, the attendance patterns of Pell Grant recipients had changed with a smaller proportion of such students, 45%, attending non-profit, public and private four-year colleges, and a larger share, 54%, enrolled at proprietary institutions and community colleges (U.S. Department of Education, 2006). For-profit institutions accounted for 18% of all Pell

Grant enrollments, while the largest single share of Pell Grant recipients, 36%, attended community colleges. These data suggest that policy changes that have occurred over the last several years, including decreased purchasing power of the Pell Grant and increased support for loans and tax credits that primarily aid middle income students, may have adversely affected low-income students' college choice decisions (College Board, 2006).

Differences in the types of institutions attended by many minority and low-income students compared to those attended by their White and higher-income peers warrant further consideration given that bachelor's degree completion rates are higher among students who first enroll at four-year rather than two-year institutions, that individuals who begin at four-year institutions are more likely to attend graduate or professional school than those who start at two-year colleges, and that students who attend and graduate from four-year institutions accrue more lucrative benefits than those who obtain some postsecondary schooling, but do not earn bachelor's degrees (Karen, 1991; Knapp et al., 2006; Mortenson, 2003).

While research has found differences in outcomes associated with graduating from two-year versus four-year colleges, studies examining the relationship between the selectivity levels of four-year institutions and graduates' earnings have yielded inconclusive results. For example, Brewer et al. (1999) found large earnings differentials between students who attended private elite colleges and those who attended less selective institutions. Conversely, Dale and Krueger's (2002) findings suggested that college selectivity did not have a significant affect on graduates' salaries after controlling for background variables.

In a recent study, Zhang (2005) summarized the literature examining the relationship between the characteristics of college attended and earnings. He acknowledged that studies that explore the effect of college quality on earnings have produced mixed findings, but posits that most analyses that examine this phenomenon have found institutional selectivity to have a statistically significant, though monetarily very small, effect on graduates' actual earnings. In his own analysis of the relationship between college quality and earnings, Zhang (2005) used a single dataset to measure the effect of four different measures of college quality (Barron's selectivity rating, mean SAT scores, Carnegie classification and tuition and fees) on graduates' salaries. His findings revealed that the relationship between college quality and earnings was generally both positive and significant, regardless of the measure of college quality employed. Zhang posited that previous studies examining the relationship between college quality and earnings may have produced contradictory results because institutions included in the various analyses were categorized differently depending on the measure of college quality used by researchers. Thus, he suggested that future research on this topic provide explicit explanations for how different college quality variables are measured and defined, and how institutions are classified according to the various definitions.

While all sectors of post-secondary education (e.g., public and private, four-year institutions and community colleges) impart benefits of varying degrees upon their graduates, some evidence suggests that students who attend the most selective and prestigious four-year colleges and universities receive the most prized societal opportunities (Bowen & Bok, 1998; Thomas, 2000; Zhang, 2005). In addition to higher annual earnings, these benefits typically include prestigious corporate, political and

community leadership positions as well as admission into top-tier graduate and professional programs (Lang, 1986; Turner & Pusser, 2004). However, the majority of African Americans, Latinos and low-income students are not privy to these benefits because, when compared to their White, Asian and higher income counterparts, they are much more likely to attend community colleges, less-selective four-year universities and for-profit institutions (Nora, 1993; Turner & Pusser, 2004).

### Purpose of the Study

Although higher education is an excellent societal and individual investment for most students, different benefits accrue to college graduates based on the type of postsecondary institution they attend (Turner & Pusser, 2004; Zhang, 2005). Thus, researchers argue that enhancing college opportunity for underrepresented populations means not only ensuring that these individuals have the option of enrolling in some form of postsecondary education, but also requires advocacy organizations and policymakers alike to be concerned with how equitably students are distributed among various types of institutions (Astin & Oseguera, 2004; Hearn, 1991; Karen, 1991).

The degree to which students from different backgrounds have access to various institutional types has become an important issue to examine within the context of public higher education. Research suggests that some of the nation's public universities have modified several of their key policies and practices in order to ascend the postsecondary hierarchy, and compete with their aspirational peers for the most talented students and faculty members (Dey, Milem & Berger, 1997; Ehrenberg, Zhang & Levin, 2006; Morphew & Becker, 2005). In many cases, this trend has resulted in less economically

and racially diverse student populations at many public four-year institutions. This phenomenon has been particularly true of public flagship universities which, in the last 30 years, have become increasingly selective and often require admitted students to have standardized test scores, grade point averages and class ranks that are well above average (Miller, Rivell & Walter, 1991; Wightman, 2003). Increased institutional selectivity coupled with skyrocketing tuition has caused many public flagship universities to become inaccessible for many African American, Latino and low-income students (Gerald & Haycock, 2006; Turner & Pusser, 2004).

Many studies cite the inadequate levels of academic preparation of low-income, Black and Latino students as a primary reason for their lower college enrollment rates, when compared to students from other groups (Berkner & Chavez, 1997; Cabrera & LaNasa, 2001). However, some studies suggest that there is an adequate supply of highly-talented students from these groups that would qualify for admission to even the most selective institutions. For example, in a recent study, Gerald and Haycock (2006) calculated the number of low-income students whose SAT scores should have put them in the admissibility range for many of the nation's flagship universities. They concluded that, while flagship campuses only enrolled an estimated 42,000 low-income students in the fall of 2003, more than 60,000 additional low-income students had standardized test scores that would have made them likely candidates for admission at many flagship institutions. They also contend that their estimate of the number of high-scoring, low-income students was conservative given that:

Another 238,000 students who scored at least an 1110 on [the standardized assessment tests] did not report their income. Given that students from low-



income families are more likely than others not to report their income, we can conclude that there were actually many more low-income students whom the flagships could have recruited for admission to their institutions (Gerald & Haycock, 2006, p. 16).

This study extends prior research that has examined postsecondary access and equity in enrollments for underrepresented minority and low-income students. This examination does not explore the broader phenomenon of diversity, which can include such categories as gender, learning styles and political affiliations, but instead focuses on equity in undergraduate enrollments for students from racial/ethnic and income groups that have historically been underrepresented in postsecondary education. Using a conceptual framework that combines components of econometric and institutional theories, I examine the status of access for Black, Latino, and low-income students at the nation's public flagship institutions relative to the status of access for these students at other public four-year institutions. The study follows the example of prior research (Bensimon, Hao & Bustillos, 2006; Perna et al., 2006) by using equity indices to determine the degree to which students from the aforementioned groups are represented at various public four-year institutions. The equity index for Black and Latino students compares the proportion of these students among first-time, full-time freshmen at a college or university, or group of institutions, to the proportion of these students among all public high school graduates in a particular state. The equity index for low-income students compares the proportion of Pell Grant recipients among all undergraduates at a college or university to the proportion of 18-24 year old high school graduates in a given

state from low-income families. I also examine whether, over time, the equity indices for the flagship universities have increased or decreased relative to the equity indices for other public four-year institutions. Additionally, the study identifies institutional characteristics that are associated with equity indices for these groups of students and tests whether variables that are indicative of isomorphic behavior patterns on the part of colleges and universities are correlated with their equity indices. Finally, the analyses examine whether being a flagship university is a significant predictor of institutions' enrollment equity indices for Black Latino and low-income students. More specifically, I examine the following four research questions:

1. How does the status of equity in undergraduate enrollments for Black, Latino and low-income students at all public four-year universities compare to the status of equity in undergraduate enrollments for these students at public flagship universities?
2. How do trends in equity in undergraduate enrollments for Black, Latino and low-income students at all public four-year universities between 1994 and 2004, compare to trends in equity in undergraduate enrollments for these students at public flagship universities over the same period?
3. What measures of human capital and institutional isomorphism are associated with enrollment equity indices for Black, Latino and low-income students?
4. Is an institution's flagship status associated with enrollment equity indices for Black, Latino and low-income students at public four-year universities?

## Theoretical and Conceptual Framework

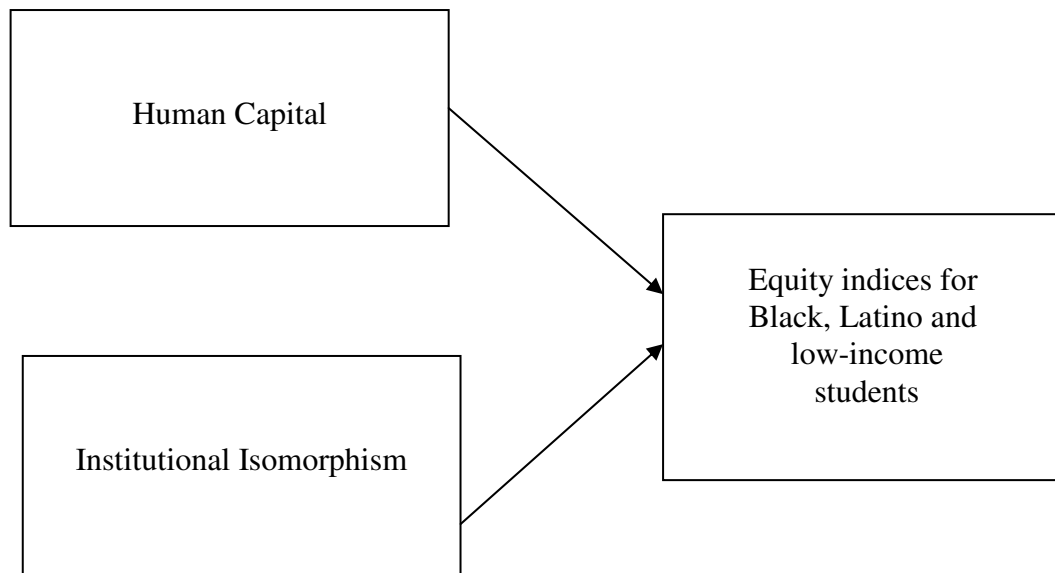
The conceptual framework for this study combines econometric and institutional theories in an effort to identify factors that influence the equity indices for underrepresented students at public four-year institutions, with special emphasis on the equity indices for students at the most prestigious public institutions, flagship universities. Many college access models utilize econometric approaches to explain differences in the college enrollment rates of various groups (Heller, 1999; Kane, 1999; Kim, 2004). But, few studies combine econometric and institutional theoretical perspectives, thereby limiting understandings of the extent to which college access is also shaped by an institution's aspirations to ascend the postsecondary hierarchy. Thus, this study introduces an integrated conceptual framework that may be used to develop new understandings of complex college access problems.

Figure 1 illustrates the conceptual model that is used to examine equity indices for Black, Latino and low-income students at public flagship universities and other public four-year institutions. This model was developed based upon a review of two bodies of literature: 1) literature examining the factors that affect the enrollment patterns of different groups of students within particular types of institutions, and 2) literature examining the variables that are associated with institutions seeking to become more prestigious. The human capital and institutional isomorphism categories included in the conceptual model are informed by elements of econometric and institutional theories, and include institutional and state-level variables. Prior research suggests that variables that fit within these two contexts (e.g., cost of attendance, selectivity, distribution of expenditures, statewide unemployment rates) impact the degree to which minority and

low-income students enroll in college and attend various types of institutions (Braunstein, McGrath, Pescatrice, 1999; Perna & Titus, 2004).

The human capital category includes cost of attendance, financial factors and labor market variables. The inclusion of these measures in the conceptual model is supported by human capital theory which suggests that students make decisions about whether or not to enroll in college after considering the direct and indirect costs

Figure 1.1. Conceptual model for access to public, four-year institutions.



associated with doing so (Becker, 1993; Heller, 1997). In their analysis of the state policy context for higher education in the state of Maryland, Perna, Steele, Woda and Hibbert (2005) found that a number of institutional and state-level cost of attendance variables were related to the degree to which different racial/ethnic groups were represented in various sectors of public higher education. Their analyses showed that

tuition price, the proportion of state financial aid awarded on the basis of financial need, and the state's unemployment rate were related to the enrollment patterns of various racial and ethnic groups within different postsecondary education sectors. Similarly, in their examination of merit-based scholarship programs in Florida and Michigan, Heller and Schwartz (2002) found that non need-based scholarships were least likely to be distributed to or to affect the college-going behaviors of students from groups that had traditionally been underrepresented in higher education.

The conceptual model's institutional isomorphism category includes measures of institutional expenditures, selectivity and flagship status, and is best explained by institutional theory which suggests that in an attempt to be perceived as more prestigious, some institutions, including some public flagships, have both become more selective and changed their spending patterns, over time. For example, Harter, Wade and Watkins (2005) assert that as institutions attempt to become like more highly-regarded universities they tend to spend more on research-related projects and less on instruction and student support services.

Equity indices for Black, Latino and low-income students serve as the dependent variables in the model. The indices control for differences in levels of academic preparation and attainment levels by comparing students from each group who are enrolled in college (the numerator) to high school graduates from each group (the denominator). The conceptual model and the theoretical perspectives upon which it is based are discussed more fully in Chapter 3.

## Research Method

This study uses publicly available data from the following eight sources: 1) Fall Enrollment and Finance Surveys of the Integrated Postsecondary Education Data System (IPEDS); 2) Western Interstate Commission for Higher Education; 3) the Integrated Public Use Microdata Series (IPUMS); 4) *Measuring Up 2006*; 5) National Association of State Sponsored Student Aid Programs; 6) *Postsecondary Education Opportunity*, and 7) the Bureau of Labor Statistics.

With a few exceptions, this study's dataset includes enrollment data for all public four-year colleges and universities in the country. Descriptive and multivariate regression analyses are used to address the research questions. Separate enrollment equity indices for Black, Latino and low-income students are calculated for 1994 and 2004 for all public four-year institutions in the aggregate in each state, with the exception of the flagship, and for the public flagship university in each state.

## Significance of the Study

The cumulative impact of anticipated demographic changes in the populace, an expected shortage in the number of college educated workers, and the relationship between an educated citizenry and a country's economic growth have prompted members of the higher education community, business leaders and policymakers alike to seek ways to broaden postsecondary access for students from underrepresented groups (Carnevale, 2002, 2006; Hanushek, 2002). However, the underrepresentation of Blacks, Latinos and low-income students in certain sectors of higher education indicates that, to be most relevant, college access research must not only examine the extent to which these

populations gain entry into higher education, but should also explore the degree to which they have access to selective-four year institutions, i.e., institutions that are associated with the greatest long-term benefits (Bowen & Bok, 1998; Karen, 1991; Zhang, 2005). This assertion is also supported by Hearn's stance that, "those who are fortunate enough to attend the most advantaged institutions, receive, in turn, further good fortune as a result of their attendance" (p. 159). Thus, this study should prove helpful in focusing the college access discussion on ensuring that students from all racial and ethnic groups and social class backgrounds have an equal opportunity to enroll in the public institutions that are most likely to provide them with the greatest return on their investment.

While college access is one of the most widely explored areas in higher education research, and many studies confirm the prevalence of inequities in college enrollment patterns by race/ethnicity and income levels (e.g., Advisory Committee on Student Financial Assistance, 2002; Astin & Oseguera, 2004; Cabrera & La Nasa, 2001; Perna, 2000), few examine the enrollment rates of minority and economically disadvantaged students at public four-year institutions, and an even smaller number explore the degree to which these students attend public flagship universities (exception include: Gerald & Haycock, 2006; Perna et al., 2006). Therefore, this study offers a means for identifying factors related to institutions having higher or lower equity indices for underrepresented groups, and provides a way of examining whether universities' equity indices are correlated with the variables that are associated with institutions seeking to become more prestigious. It also compares equity indices at all public four-year universities with equity indices at flagship universities, and examines whether factors related to higher or lower equity indices differ by institutions' flagship status.

This study is based on prior access research, particularly Bensimon et al.'s. (2006) and Perna et al.'s. (2006) examination of the status of equity in public higher education for minority students, and Perna et al.'s. (2005) examination of the relationship between Maryland's policy context and the college enrollment patterns of students from different racial/ethnic backgrounds at various types of institutions in that state. This project builds on these prior research studies in a number of ways. First, Bensimon et al.'s study calculated equity indices for Black and Latino students at three university systems in one state and Perna et al.'s (2006) study calculated equity indices for Black students only at a number of different postsecondary sectors in 19 states. By calculating equity indices for both Black and Latino students at all public four-year institutions in all 50 states, and by using multivariate analyses to understand the relationship between both institutional and state-level variables and the equity indices, this study addresses several recommendations by Perna et al. about areas for future research. The first area of future research that this study addresses is the need to examine sources of variations in the equity indices, such as state aid policies, over time and throughout the country. Second, in addition to examining the status of equity in higher education for Black undergraduates I also examine the status of equity for Latinos and low-income students, two additional groups that are also underrepresented in postsecondary education. Finally, this study builds on Perna et al.'s (2006) recommendations by taking a closer look at equity for these groups at flagship campuses, which, of all the postsecondary sectors included in Perna et al.'s analyses, had, on average, the lowest equity indices for Black students.

This study also makes a significant contribution to higher education research by building on Perna et al.'s (2005) study and examining the degree to which institutional



and state policies, which are measured by variables included in the conceptual model's human capital and institutional isomorphism categories, are related to variations in college access for various groups of students in all 50 states. Perna et al. (2005) found that the proportion of state aid distributed on the basis of need, changes in the unemployment rate, changes in the state's appropriations for higher education, and changes in tuition prices were all related to the degree to which students of different racial/ethnic groups enrolled at various institutions in one state.

This research also contributes to theory in a number of ways. First, it employs human capital theory, which has traditionally been applied to studies using students as the unit of analysis, to help explain how institutional and state policies and practices may affect equity indices by influencing students' opportunities to access certain institutions. The study's findings may suggest, for example, that traditional college enrollment variables, such as financial aid and tuition prices, in concert with institutional level variables such as selectivity and those that measure expenditure patterns, have a strong combined effect on equity in undergraduate enrollments. Second, because this study is one of the first to use a conceptual model based on human capital and institutional theories its findings may suggest that more can be learned about broadening access for underrepresented students, particularly in the public four-year sector, if a combination of these two theories is applied to enrollment models.

Finally, this research has several implications for policy and practice. Results of this study will illuminate how variables shaped by econometric and institutional theories influence students' ability to access public four-year institutions. These findings may identify institutional policies, such as those that govern admissions and spending

practices, and/or state policies, such as those that affect student financial aid allocations, that should be modified if institutions are to increase equity indices for Black, Latino and low-income students. Additionally, while it is necessary to consider how modifying institutional and state-level factors can enhance equity for underrepresented groups, this study's findings may suggest that either institutional or state-level policy variables exert a stronger influence on institutions' equity indices. If this is the case, these results may have implications for whether state policymakers or college and university leaders are positioned to make the policy adjustments that are likely to have the most immediate affect of increasing equity for underrepresented groups.

## CHAPTER 2

### LITERATURE REVIEW

#### Introduction

This literature review provides background information and support for the present study which examines the status of equity in undergraduate enrollments for Black, Latino and low-income students at all public four-year institutions compared to the status of equity for these groups at public flagship universities. The chapter reviews theoretical frameworks that have been used to examine students' college-going behaviors and the phenomenon of the pursuit of prestige within higher education, and summarizes what has been learned about these topics from existing research. This literature review also describes how an expanded framework that incorporates constructs from econometric and institutional theoretical perspectives can enhance our understanding of college access and can be used to address inequities in undergraduate student enrollments within the public four-year sector.

This chapter begins by describing the use of equity indices to determine if particular groups of students are adequately represented in various sectors of the postsecondary system. Next, I review frameworks based on econometric and institutional theories, describe how these approaches help explain the college enrollment patterns of minority and low-income students, and summarize what has been learned from previous research that has been based on these perspectives. Finally, I describe the two main categories that comprise my integrated conceptual model.

## Equity in Public Higher Education

Although college access is a widely studied topic in higher education research, equity in enrollments across various postsecondary sectors, such as public four-year universities and selective public institutions, is less widely examined. However, two recent studies by Bensimon et al. (2006) and Perna et al. (2006) focus on the degree to which minority students are equitably represented in public higher education in the years since legal rulings (e.g., *Hopwood v. Texas* and *Poderbesky v. Kirwan*) and legislative mandates (e.g., Proposition 209) have limited or prohibited institutions in some states from considering race as a factor in admissions decisions and operating recruitment or scholarship programs that solely benefit minority students.

Bensimon et al. (2006) introduced the concepts of the Academic Equity Scorecard and the Academic Equity Index (AEI) as ways of allowing individual postsecondary institutions, as well as state higher education systems and coordinating boards, to include equity measures for a variety of outcomes as part of their accountability plans. The researchers assert that “even though the need for measures of equitable educational outcomes for racial and ethnic groups with a history of underrepresentation in higher education seems so obvious, the reality is that most states’ higher education systems are rarely evaluated on the metric of equity” (p. 146).

The Academic Equity Scorecard evaluates institutions and/or systems in four categories: access, retention, institutional receptivity (i.e., the racial/ethnic composition of faculty) and excellence (e.g., the number of engineering and doctoral degrees awarded to underrepresented minority students). Twelve performance indicators and 22 progress measures are included in the scorecard. An Academic Equity Index (AEI) is defined as

the degree of representation and proportionality of each racial/ethnic group among the relevant reference population, and it is calculated for each indicator for a specific point in time. Equation (1) illustrates the Academic Equity Index. The AEI for a specific educational outcome for members of a specific target group is equal to the number of students in the target group with a specific educational outcome divided by the number of all students with that same educational outcome, compared to the number of target group members in the relevant reference population divided by the number of all students in the relevant reference population.

<b>Academic Equity Index</b>		
Target Group's Equity Index for a specific educational outcome	=	$\frac{\text{Target group with specific outcome/} \\ \text{Total students with specific outcome}}{\text{Target group in reference population/} \\ \text{Total students in reference population}}$
		<b>Equation (1)</b>

Bensimon and colleagues (2006) used the Academic Equity Scorecard to analyze whether African American, Asian, Hispanic and White students were proportionally represented in various sectors of higher education in California. They argued that California was an appropriate demonstration site for an equity analysis because it is the most populous state in the nation and because a significant proportion of its undergraduates are minority students. Bensimon et al. suggest that California “acutely exemplifies the growing educational chasm between Latinos and African Americans on the one hand and Asian Americans and Whites on the other” (p. 148). The authors calculated equity indices for each of the 22 indicators for each of four racial and ethnic groups within each of California’s three postsecondary systems: the California

Community Colleges, the California State University (CSU) System and the University of California (UC) System. Their findings revealed that African Americans and Latinos were below equity on a majority of the indicators, while Asians and Whites were at or above equity on most of the indicators. African Americans were below equity on 13 of the 22 measures, including 6 of the 10 access measures. They were more than 50 percentage points below equity on the following measures: 1) the proportion of African Americans enrolling at UC institutions relative to the proportion of African American high school graduates in the state (0.50); 2) the number of African American community college students transferring to the UC system relative to the number of African American students enrolled in community colleges (0.40), and; 3) the number of bachelor's degrees granted to African Americans by the CSU (0.50) and UC (0.40) systems relative to the number of African Americans in the 20-24 year old population in the state.

Latinos fared even worse than African Americans in terms of achieving equity in postsecondary education in California, as they were below equity on 21 of the 22 indicators and at least 50 percentage points below equity on 15 of the 22 measures. Latinos experienced the greatest inequity in the proportion of bachelor's degrees awarded by the CSU and UC systems relative to the proportion of Latinos in California's population of 20-24 year olds. The Academic Equity Index for this measure was 0.30 or 70 percentage points below equity at both CSU and UC.

Bensimon and colleagues' (2006) study of the status of equity in California's higher education system provides both policymakers and researchers with a simple tool for gauging whether students, particularly those from groups that have historically been

underrepresented in postsecondary institutions, are fairly accounted for in various higher education sectors and systems. However, their examination has several limitations. First, the analyses are descriptive only and thus do not provide any indication of sources of the inequities for African Americans and Latinos which were most profound in the UC and CSU systems. More specifically, the Bensimon et al. study did not control for important factors that shape California's higher education policy context and are therefore likely to influence its equity indices. For example, the Bensimon et al. model did not account for the California master plan which states that only the top one-eighth (12.5%) and the top one-third (33.3%) of high school graduates in the state can be admitted to UC and CSU institutions, respectively (Alpert, Alquist & Strom-Martin, 2002).

Perna et al. (2006) used a version of the Academic Equity Index to measure the status of equity in enrollments and completions for Black undergraduates in public higher education in the 19 southern and southern-border states which, prior to the 1954 *Brown v. Board of Education* decision, operated dual, racially segregated systems of higher education. Using data from the Integrated Postsecondary Education Data System, Perna and colleagues employed descriptive statistics to analyze trends in the status of equity for Black students among first-time full-time freshmen, between 1991 and 2001, at the following institutional types within the 19 states: 1) all public institutions, 2) two-year colleges, 3) four-year historically Black colleges and universities (HBCUs), and 4) predominately White institutions (PWIs).

Perna et al's. (2006) findings revealed inconsistencies in the status of equity for Black undergraduates across various sectors of the postsecondary system. Black students achieved or exceeded equity in enrollments at all public higher education institutions in

five of the 19 states and were below equity by at least 20 percentage points in seven of the 19 states. In light of these results, Perna and colleagues acknowledged that calculating equity indices for all public institutions in a state is somewhat misleading because doing so “masks” variations in equity that may be evident across different sectors of higher education within the same state. Thus, when the status of equity for Black students among first-time, full-time freshmen within each institutional sector was explored, the results showed that in most states Black students exceeded equity at the four-year HBCUs and achieved equity at two-year colleges, but were below equity at four-year PWIs and were substantially below equity at public flagship universities.

Perna and colleagues’ (2006) examination of trends in the status of equity for Black undergraduate enrollments between 1991 and 2001 also found variations across the 19 southern and southern-border states and among the different institutional sectors within the states. The equity indices for Black students at public four-year PWIs increased in 10 states and decreased in nine states over the 10-year period. However, changes in the states’ equity indices were small, as no state had an increase or decrease of more than 12 percentage points. When compared to the equity indices for public four-year PWIs in the aggregate, the public flagship universities made less progress in achieving equity in Black student enrollments. The equity indices for Black students increased at public flagships in six states from 1991 to 2001, but similar to increases at the four-year PWIs, gains at the flagships were small, ranging from only 2 percentage points to 11 percentage points. Conversely, the equity indices for Black student enrollments decreased at flagships in 12 of the 19 states, and the decreases ranged from 5 percentage points for Louisiana’s flagship to a decrease of 26 percentage points for



Oklahoma's flagships, the University of Oklahoma and Oklahoma State University. The equity index for one flagship, the University of Alabama, remained the same over the 10 year period. These findings pertaining to the current status and trends in access for Black students in public higher education in the South, led Perna et al. (2006) to conclude the following:

Despite some progress, in some states, for some outcomes, at some points in time, between 1991 and 2001, substantial inequities in enrollment and bachelor's degree completion for Blacks remain...The status of Blacks varies by institutional sector with Blacks generally experiencing the greatest inequity at the public flagship institutions (p. 197).

Perna and colleagues' (2006) study of equity in public higher education in the South demonstrates the importance of examining equity indices in the aggregate in a given state, as well as analyzing how students are distributed across different institutional sectors within the same state. Perna et al.'s research is particularly relevant to my study because it suggests that, of all four institutional sectors analyzed, Black students were most underrepresented at public flagship institutions. My study builds on Perna et al.'s study by comparing equity indices for Black, Latino and low-income students at the flagship campuses in each state, with the equity indices for these groups at other public four year universities in the aggregate in each state, and by analyzing sources of the variations in the equity indices.

## Theoretical Frameworks and Research Findings

This section provides an overview of the theoretical frameworks that are used to examine and explain the two main emphases of this study: 1) variations in equity for different groups of students at all public four-year institutions in the aggregate, excluding the flagship, in each state, and at the public flagship university in each state, and 2) the effect of the pursuit of prestige that has been undertaken by many colleges and universities in the last several years on equity for these groups. I describe two key frameworks that have been used to study these areas of higher education research and present findings from analyses that have utilized each of the perspectives. The two frameworks discussed inform the research methodology of this study and serve as the basis for my conceptual model.

### *Econometric Framework*

Human capital theory has been used by many researchers (e.g., Hossler, Braxton & Coopersmith, 1989; Kane, 1999, Perna, 2000) to inform many studies that take an econometric approach to understanding and explaining college access issues. This theory suggests that enhancing a person's knowledge and skills through education and training increases productivity, and that the labor market rewards increases in productivity with higher earnings. Numerous research studies (e.g., Cohn & Geske, 2004; Perna, 2005) support a primary tenet of human capital theory which posits that investments that make it possible for individuals to earn college degrees lead to increases in their earnings trajectories even after controlling for their background characteristics and the costs they incur to obtain advanced levels of schooling (Becker, 1993).

A fundamental aspect of human capital theory presumes that, when deciding whether or not to enroll in college, prospective students weigh the costs of matriculating against the benefits of doing so. While the long-term rewards associated with attending college and earning a bachelor's degree are well documented, human capital theory suggests that students consider these benefits in relation to their personal tastes and preferences and in the context of the costs they must assume (e.g., foregone earnings, tuition, fees, books, room and board) in order to reap the ultimate benefits of earning a college degree (Becker, 1993; Cohn & Geske, 2004). Their final choice, then, about whether or not to attend college, is aligned with rational decision-making processes which suggest that, after considering all available information, individuals compare and contrast their options and then select the best possible alternative (Malen & Knapp, 1997). Human capital theory provides an appropriate theoretical framework for this study because it explains how cost of attendance, ability to pay and labor market variables influence students' college enrollment and choice decisions, which thereby affect institutions' enrollment indices.

The next section of this literature review examines the following key variables that are typically included in econometric college access models: tuition, financial aid, and unemployment rates. For each set of variables, I examine the effect that the variables have on the college-going rates of all students, and then explore their impact on the college participation rates of low-income and underrepresented minority students.

### *Tuition and Financial Aid*

Human capital theory suggests and a review of the college access literature confirms that tuition prices and the amount and type of financial aid awarded influence students' decisions to enroll in college instead of pursuing other postsecondary options such as entering the labor force or joining the military. Heller (1997) reviewed approximately 20 studies conducted during the 1980's and 1990's that analyzed the separate and combined effects of tuition and financial aid on enrollment patterns, and concluded that nearly every study found a negative relationship between tuition and student enrollments (i.e., as tuition rates increased enrollment rates decreased). On average, when all other variables related to enrollment were held constant, a \$100 increase in tuition rates resulted in a decrease in student enrollments that ranged from 0.50 to 1.0 percentage points.

Heller's (1997) literature review confirmed earlier findings of student demand research. In their seminal synthesis of 25 studies that tested the effect of college price on student attendance patterns, Leslie and Brinkman (1987) concluded that a \$100 increase in the price of tuition resulted in a 0.75 percentage point decrease in the college enrollment rate of the 18 to 24 year old population. Stated differently, since the college participation rate of 18 to 24 year olds was 33% in 1982, a \$100 tuition increase would have resulted in a 2.1% decline in postsecondary enrollments at that time. St. John (1990) found that a \$1,000 increase in tuition was correlated with a 2.8% decrease in college enrollment rates. Thus, the impact of tuition on student enrollments remained relatively stable over time, and multiple researchers concluded that increases in tuition prices had detrimental effects on matriculation rates.

Many researchers have examined the separate and combined effects of tuition and financial aid on student enrollments. Most studies that explore this issue conclude that there is an inverse relationship between tuition price and student enrollments, but that the adverse affect of tuition increases can be mitigated, at least to some degree, by certain types of financial aid (Braunstein, McGrath & Pestcatrice, 1999; Leslie & Brinkman, 1987; Kim, 2004; St. John, 1990).

Some forms of financial aid have the effect of lowering the net tuition price, which is the tuition amount that students and their families are actually responsible for paying (Davis, 2003; Heller, 1996). Thus, when examining the relationship between the cost of tuition and enrollment rates, it is equally important to explore the influence of the net price (i.e., tuition less financial aid) on student enrollment patterns. This practice, commonly known as tuition discounting, results in few students paying the advertised tuition amount, or sticker price of tuition.

Moore, Studenmund and Slobko (1991) examined the effect of tuition discounting on enrollment rates at Occidental College, a small, private, liberal arts institution. They also analyzed whether various types of aid had different impacts on students' enrollment decisions. The researchers found that for all financial aid applicants, a \$1,000 increase in a grant offer, or a \$1,000 decrease in the net price of tuition, increased the probability of a student enrolling by nearly 8%. On the other hand, changes in students' loan or work study amounts did not affect their likelihood of enrolling. Similarly, Braunstein, McGrath and Pescatrice (1999) found that a \$1,000 increase in a financial aid offer resulted in an increased probability of between 1.1% and 2.5% of a student enrolling at an institution. However, contrary to Moore, Studenmund and Slobko's findings, these

researchers concluded that a \$1,000 increase in loans was correlated with a 5% increase in enrollments. Their analyses also revealed that a \$1,000 increase in grants was correlated with a 3% increase in enrollments, while work study funds did not impact enrollment rates.

While some studies suggest that students have different reactions to various forms of financial aid, St. John (1990) concluded just the opposite. Using data obtained from the High School and Beyond sophomore cohort, he found that, after controlling for academic ability levels and background characteristics, grants, loans and work study were all positively correlated with increased student enrollment rates. St. John concluded that a \$1,000 increase in grants, loan or work study amounts resulted in predicted enrollment increases of 4.3%, 3.8% and 4.6% respectively. Thus, the author argued that increasing all types of financial aid was as effective at facilitating student enrollment in postsecondary education as was decreasing tuition by an equivalent dollar amount.

Once a student decides to enroll in college, tuition and financial aid also impact the choice of which institution to attend. In their examination of students' college-going patterns and college-choice decisions, Hossler, Braxton, and Coopersmith (1989) found that attendance costs, including expenses associated with enrolling in a particular institution (i.e., tuition, fees and room and board), net tuition (the published tuition price minus financial aid), and the ratio between the cost of attending a specific college and the discretionary income of students' families, significantly influenced students' college-choice decisions. The researchers assert that, in most cases, the probability of a student enrolling in a particular institution decreases if a school's attendance costs exceed family

income. They also suggest that students' socioeconomic backgrounds are related to the cost and quality of the colleges and universities to which they apply and attend.

The relationship between attendance costs, family income and the likelihood that a student will enroll at a specific college or university suggests the importance of considering the role that rising tuition at public four-year institutions has had on student enrollment patterns within this sector. According to a recent analysis by Wellman (2006), since 1980 the price of attending college has increased at a greater rate than median family income, the cost of health insurance or the price of prescription drugs. Moreover, of all sectors of higher education, she asserts that tuition increases have been most marked at public four-year institutions. St. John (2005) argues that such increases have made attending and paying for college increasingly burdensome for low-income students, and that even after accounting for all sources of financial aid, these students face a funding gap (the difference between the cost of attendance and the maximum Pell award) of over \$6,000.

#### *Effects of Tuition and Financial Aid on Students of Different Income Groups*

Kim (2004) argues that the goal of financial aid is to make a college education an affordable option for all students who meet certain academic qualifications, regardless of their personal income. Given this premise, it is necessary for research to address the relationship between financial aid and college enrollment, generally, and whether financial aid, in all of its various forms, has differential effects on the enrollment rates of students from different income groups. Furthermore, Heller (1996, 1997) argues that it is especially important to understand if various groups of students respond differently to

financial aid awards given that while all students are subject to fluctuations in tuition prices, financial aid dollars can be targeted toward one group of students or another, if necessary, by modifying eligibility requirements.

St. John (1990) examined whether changes in tuition, grants and loans had varying effects on the enrollment decisions of students from different income categories. He divided students into four, \$15,000 income intervals which ranged from those with family incomes of less than \$15,000 annually to those whose families earned more than \$45,000 each year. After controlling for background characteristics, the analyses revealed that students in the lowest three income categories were equally sensitive to a \$100 tuition decrease which increased the probability of enrolling in college by between 0.34 and 0.39 percentage points. As expected, the same tuition decrease had a smaller effect on students in the highest income category, as a \$100 tuition decrease resulted in a 0.14 percentage point increase in the probability of enrolling. In terms of the effect of grant aid on enrollment decisions, students in the lowest income category were more sensitive to a \$100 increase in grant aid than students from higher income families. A \$100 increase in grant aid led to a 0.88 percentage point increase in the likelihood of students from low-income families enrolling in postsecondary education, compared with more moderate increases of 0.35 and 0.33 percentage points, respectively, for lower-middle and middle income students and no statistically significant effect for students in the highest income categories. The effect of loan increases on matriculation rates also varied according to income quartiles. While a \$100 increase in the amount of a loan offer had statistically significant positive effects of 0.53 and 0.63 percentage points, respectively, on lower-middle and middle-income students' enrollment decisions, there



was not a statistically significant relationship between the same loan increase and enrollment rates for students in the lowest and highest-income categories. Based on these findings, St. John concluded that students in the lowest income category may have responded more positively to increases in grant aid than to decreases in tuition because their enrollment decisions were driven by a greater concern for the net tuition price that they would have actually been responsible for paying, than for the sticker price.

Like St. John (1990), other researchers have examined whether the effect of tuition and financial aid awards on enrollment rates vary based on students' background characteristics. In a leading examination of determinants of students' college-choice practices, Manski and Wise (1983) used data from the National Longitudinal Study of the High School Class of 1972 to gauge the impact of the Basic Education Opportunity Grant (BEOG) Program, now the Pell Grant Program, on college enrollment rates. The authors estimated that the BEOG had the effect of increasing the overall undergraduate enrollment rate by 21% and increasing the college enrollment rate of low-income students by 60%. Furthermore, they concluded that 41% of BEOG awards to low-income students were disbursed to individuals who would not have enrolled in college without the monetary assistance provided by the grant. However, the authors note that BEOG awards had no effect on enrollment rates in four-year colleges and universities, and primarily facilitated low-income students' access to the two-year sector. In another early study, Blakemore and Low (1985) used the same NELS:72 dataset to analyze the effects of decreases in state financial aid awards and increases in tuition on the enrollment patterns of students from different income levels. They found that the probability of low-income students enrolling in college decreased from between 2.5% to 24.3%, depending

on the magnitude of the aid decreases and tuition increases, while the probability of high-income students enrolling decreased at more moderate rates of between 1.1% and 8.3%.

A series of papers produced by the Williams Project on the Economics of Education also examined the relationship between tuition prices, financial aid and student enrollment patterns. One installment in the series by McPherson and Schapiro (1994) suggests that tuition increases coupled with decreases in federal grant aid have resulted in many low-income students enrolling in community colleges rather than four-year institutions. The authors assert that the overrepresentation of low-income students in the two-year sector of higher education is illustrative of the fact that these students are more sensitive to tuition increases and aid decreases than their higher income counterparts. Similarly, St. John (2005) argues that the overrepresentation of low-income students in community colleges is largely due to tuition increases at public four-year colleges that have out-paced increases in the purchasing power of the Pell Grant. In 1979, the maximum Pell Grant award of \$1,600 covered 75% of the cost of attending a four-year public college, but by 2005 the maximum Pell award of \$4,050 covered only 22% of those costs (College Board, 2006).

Although research suggests (e.g., Heller, 1997; McPherson and Schapiro, 2001; St. John, 1990) that need-based grant aid facilitates college access for low-income students, many states have shifted substantial proportions of their financial aid budgets from need-based awards to merit-based grants which are typically based on students' academic performance in high school or standardized test scores, and not on their family's financial status (Farrell, 2004; Heller, 2001; Heller & Schwartz, 2002). While states increased their expenditures on need-based financial aid by 90% over the past

decade, the proportion of their budgets devoted to merit-based aid increased by over 300% during the same time period (National Association of State and Student Grant Aid Programs [NASSGAP], 2006). Thus, while 87% of state financial aid was disbursed in the form of need-based grants and 13% was distributed in the form of merit awards in the 1994-1995 academic year. A decade later in 2004-2005 a smaller proportion of state financial aid budgets was allocated to need-based aid (73%) while a larger proportion (27%) was spent on non need-based, merit aid.

Given the recent trend of state's providing more financial aid in the form of merit-based scholarships, Heller and Schwartz (2002) examined the impact of these scholarship programs on the college enrollment rates of low-income students. Using data from two state merit-aid programs, Florida's Bright Futures Scholarship and Michigan's Merit Scholarship, the researchers compared the distribution of scholarship recipients from various groups to the distribution of students from each of those groups in the relevant reference population. To measure the degree to which low-income students benefited from the merit-aid programs, Heller and Schwartz placed each public high school in both states into one of five quintiles based on the proportion of its students that participated in the National School Lunch Program (NSLP), a common proxy for low-income status. The proportion of students receiving free and reduced lunch in each of the five quintiles was then compared to the proportion of students in those same quintiles who received merit scholarships.

Heller and Schwartz's (2002) analysis of the distribution of merit grant aid awards to students from different economic backgrounds (as measured by schools' NSLP quintiles) found a direct relationship between students' income levels and their

scholarship qualification rates. In Florida, 28% of students attending a school in the 1<sup>st</sup> quintile, which was comprised of schools with the lowest percentage of students participating in the NSLP, qualified for a Bright Futures award, compared to only 11% of students attending a school in the 5<sup>th</sup> quintile, which included schools with the highest percentage of students participating in the NSLP. Inequities in the receipt of merit-aid by income-level were more prevalent in Michigan than in Florida. In Michigan, where 46% of students attending schools in the 1<sup>st</sup> NSLP quintile received a scholarship, compared to only 16% of those attending schools in the 5<sup>th</sup> quintile. The analyses of merit aid programs in Florida and Michigan led Heller and Schwartz to conclude that there was a strong relationship between students' income levels and their probability of receiving merit-based grants in both states. They also asserted that higher-income students in both Florida and Michigan were twice as likely as their lower-income peers to receive the grants.

#### *Effects of Tuition and Financial Aid on Students of Different Racial/Ethnic Groups*

Prior research suggests that tuition prices and financial aid offers also have differential effects on the enrollment and choice decisions of students from various racial and ethnic groups. Behrman, Kletzer, McPherson and Shapiro (1992) analyzed the probability of a student not enrolling in postsecondary education or enrolling in a two or four-year institution, after controlling for such characteristics as academic ability, family income and labor market variables. They found that tuition increases at four-year institutions resulted in increased enrollment rates for Black and Latino students in the two-year sector, but did not affect their matriculation rates in the four-year sector.

Conversely, the same tuition increases did not affect enrollment rates for White students in the two-year sector, but increased their enrollment rates at four-year institutions.

These findings may indicate that Black and Latino students are more adversely affected by tuition increases than White students, and that tuition fluctuations contribute to a stratified postsecondary system where minority students are overrepresented in the two-year sector. Behrman et al. also suggested that the positive relationship between tuition increases and White student enrollments at four-year colleges may indicate that these students equate higher tuition prices with increased institutional quality, and that the perception of enhanced quality mitigates the negative effects of the tuition increases.

Similar to Behrman and colleagues' findings (1992), Perna et al.'s (2005) analyses showed that Black students were particularly disadvantaged by tuition increases. Their research suggests that the representation of Blacks among first-time, full-time freshmen at four-year colleges in Maryland was negatively correlated with tuition prices. This relationship resulted in Blacks being overrepresented in the state's lower cost historically Black colleges and universities where they comprised 90% of the student population, and less represented at other public (11%) and private (9%) four-year universities. Trends in tuition increases in Maryland between 1990-1991 and 2000-2001 also revealed that tuition prices increased most precipitously at the public four-year colleges and that this sector experienced the smallest increases in enrollment growth for Black students. Like others, Perna and colleagues concluded that in Maryland "differential rates of tuition increases by institutional type during the 1990s may have contributed to the increased racial/ethnic stratification of college choice" (p. 256).

While some studies suggest that tuition prices contribute to the overrepresentation of some students in certain institutional sectors, Kim (2004) argues that the goal of financial aid is to allow students to enroll in postsecondary education, regardless of their family's ability to pay, and that it is therefore necessary to examine the degree to which financial aid promotes both access to higher education and institutional choice. Using data from the Higher Education Research Institute's Freshmen Survey of 1994, Kim analyzed whether financial aid offers affected students' decisions to attend their first-choice institutions, where first-choice institution was defined as the college that a student most desired to attend of all of the colleges to which he was admitted. The chi-square analyses, which did not control for background characteristics, revealed that, while 56% of Asians and 66% of Whites perceived financial aid to be a somewhat or very important factor in their college choice decisions, higher proportions of African Americans (71%) and Latinos (83%) did so. Furthermore, for Asian and White students there was no difference in the importance of having a financial aid offer between students who attended their first or other-choice institutions; however, such differences were evident among African Americans and Latinos. Of African American and Latino students who attended their first-choice institution, 64% and 79%, respectively, responded that financial aid was a very or somewhat important factor in their college choice decisions. On the other hand, a larger share of both African American (85%) and Latino (92%) students who did not attend their first-choice institutions identified financial aid as a very or somewhat important consideration when selecting which institution they would attend. This finding suggests that African American and Latino students are more sensitive to financial aid offers than their Asian and White peers, and that financial aid offers may

cause African Americans and Latinos to change their college destinations from their first-choice institution to other more financially feasible options.

Kim's (2004) study of the relationship between financial aid offers and students' college choices also examined whether financial aid influenced institutional choice when background characteristics such as race/ethnicity, parental education and academic ability were controlled for. When controlling for background variables, Kim found that financial aid increased the probability of attending first-choice institutions for Whites and Asians by between 4% and 38% depending on the type of aid received. Conversely, financial aid in any form (i.e., grants, loans or a combination of grants and loans) did not significantly affect African American and Latino students' decisions to attend their first-choice institutions. This finding suggests that when all else is equal, African American and Latino students' college destinations are not impacted by financial aid, whereas other groups decisions are positively influenced by aid offers. Thus, Kim (2004) concludes:

If one racial group takes advantage of financial aid to attend its choice of college as compared to other racial groups, who cannot because they do not have enough information about the availability of financial aid, the procedure of applying for financial aid, or the value of different colleges, then we cannot say that financial aid provides equal educational opportunity in terms of college choice for all students regardless of race (p.63).

In terms of the effects of various forms financial aid on the enrollment decisions of different groups of students, prior research suggests that African American and Latino students are more responsive to grant aid than students from other backgrounds. In their

study of the relationship between financial aid and college enrollments, St. John and Noell (1989) found that African Americans and Latinos who received grants were 17.7 and 14.1 percentage points, respectively, more likely to matriculate at postsecondary institutions than students of the same racial/ethnic group who did not receive a grant. However, White students who received grant aid were only 8.9 percentage points more likely to enroll in college than other Whites who did not receive such financial assistance.

Heller (1997) offers three explanations for why tuition and aid variables have different effects on the college enrollment decisions of students from different racial and ethnic groups. First, he posits that because the median family income for Whites and Asians is higher, on average, than the median income for African American and Latino families, race may be a proxy for income. If this assertion is correct, one can presume that African Americans and Latinos would respond differently to tuition and grant aid increases, given that low-income and higher income students tend to have different levels of sensitivity to changes in these variables. Second, Heller proposes that the college enrollment decisions of African Americans and Latinos are more likely to be adversely influenced by tuition increases and financial aid decreases because students from these backgrounds are overrepresented among lower-achieving students, and when compared to their higher-performing peers, lower-performing students are less willing to assume financial burdens associated with attending college. Based upon this premise, Heller concludes that because Whites are more likely than African Americans or Latinos to be categorized as high-ability students, and because high-ability students tend to make financial sacrifices to attend college more often than lower-ability students, White students tend to be less sensitive to tuition increases and aid decreases, while African



American and Latino students are typically more sensitive to such fluctuations. Finally, Heller asserts that the third reason students of different racial and ethnic backgrounds might respond differently to tuition and aid changes is simply because some groups have a greater preference for pursuing higher education than others, which is consistent with human capital theory. Thus, Heller (1997) argues, “it is these ‘tastes’ for any good or service that help to shape the demand curve for that product. Irrespective of any differences in income or ability, people with different racial or cultural backgrounds may place different values on attending college” (p. 644).

Although some studies have found that grant aid is positively correlated with college enrollment rates for minority students, Black and Latino students, like those from low-income families, are underrepresented among a specific type of grant recipients, merit scholarship awardees. In an examination of the distribution of merit-based grants by race and ethnicity, Heller and Schwartz (2002) found that in Florida, African Americans and Latinos comprised 22% and 14%, respectively, of the state’s high school graduates, but only accounted for 8% and 10%, respectively, of Florida’s Bright Futures Scholarship recipients. Conversely, Asians and Whites accounted for 3% and 61%, respectively, of Florida’s high school graduates, but comprised 5% and 77%, respectively, of the merit grant recipients. A similar trend was evident for African Americans in Michigan where they accounted for a significantly greater share of the student population (14%) than of merit scholarship recipients (4%), while Latinos in Michigan comprised equitable shares of both high school students (2%) and scholarship recipients (2%). However, while Whites and Asians were 80% and 2%, respectively, of Michigan’s high school students they were overrepresented among merit scholarship

recipients where they accounted for 87% and 3%, respectively, of all awards distributed. Because Black and Latino students are overrepresented among low-income families and underrepresented among high-ability students, shifts in the proportion of state aid disbursed based upon merit may adversely affect minority students' ability to secure the financial aid needed to finance their college educations (Heller, 2001; McPherson and Schapiro, 2001).

#### *Summary of Effects of Tuition and Financial Aid*

A review of the literature examining the effect of tuition and financial aid on student enrollment rates suggests that in most cases there is an inverse relationship between tuition and matriculation rates (Heller, 1997; Leslie & Brinkman, 1987; St. John, 1990). However, some forms of financial aid such as grants, and in some cases loans, work study and various combinations of aid, can offset the adverse effects of tuition increases on college-going rates. Students' college choice decisions are also influenced by tuition and financial aid in that a student's likelihood of selecting a particular college decreases when the cost of attending that particular institution exceeds a family's discretionary income (Hossler, Braxton & Coopersmith, 1989).

Minorities and students from low-income families tend to respond differently to tuition prices and to various types of financial aid than students in the aggregate. There is generally a negative relationship between tuition and the enrollment rates of minority and low-income students, and prior research suggests that tuition increases result in some student groups enrolling in two-year rather than four-year institutions (Behrman et al, 1992, St. John, 1990). Similarly, Black, Latino and low-income students are typically

more responsive to grant aid than students from other backgrounds, and are also more sensitive to grants than other forms of financial assistance. Although grant aid is a positive predictor of enrollment rates for low-income and minority students, these groups are disproportionately underrepresented in terms of merit scholarship recipients in at least two states (Heller & Schwartz, 2002).

In terms of the relationship between financial aid and college choice, Asian, White and middle-income students are more likely than their peers from other racial/ethnic and income backgrounds to use loans to pay for their educations (Braunstein, McGrath & Pescatrice, 1999). The willingness of some groups to borrow funds to cover their college costs results in their having more options with regard to which institution they will attend. For example, Asian and White students are more likely to attend their first-choice institution than Blacks or Latinos (Kim, 2004). Such findings have led researchers (e.g., Behrman et al. 1992, Kim, 2004) to conclude that financial aid does not provide equal educational opportunity because it does not facilitate college choice for all students.

### *Unemployment Rates*

According to human capital theory, prospective students weigh the benefits and costs associated with attending college when deciding whether or not to enroll (Becker, 1993). A student's decision to enroll in college typically means delaying being employed on a full-time basis, and therefore forgoing earnings that would have accrued by entering the workforce (Cohn & Geske, 2004). As a result of this trade-off, students' estimations of their foregone earnings play an important role in their decision to enroll in college or

enter the labor market. Human capital theory suggests that foregone earnings and other opportunity costs associated with attending college decrease when unemployment rates are high. In such an environment, prospective students are less likely to find jobs at which they will earn attractive salaries, and therefore may be more likely to pursue postsecondary education. Thus, prior research suggests that college enrollment rates increase when statewide unemployment rates increase (Perna et al., 2005).

Kane (1999) suggests that in order to distinguish between the effects of tuition increases and economic conditions on college enrollment rates, it is necessary to include unemployment rates in econometric access models. His analysis of tuition changes and business cycle fluctuations on public college enrollments found that a one percentage point increase in a state's unemployment rate was associated with a 1% increase in enrollment rates at public postsecondary institutions. Disaggregating the data by sector, however, revealed more nuanced findings. Although a one percentage point increase in the unemployment rate resulted in community college enrollments increasing by 2.1 percentage points the same unemployment rate increase did not have a statistically significant effect on enrollments at public four-year colleges.

Other researchers have also found a correlation between fluctuations in the labor market and postsecondary enrollment rates. Manki and Wise (1983) assert that as local employment wages increase the likelihood that high school graduates will go directly on to college decreases. They also posit that there is an interaction effect between employment opportunities within local labor markets and college continuation rates such that a depressed labor market prompts more people to enroll in postsecondary education. To this end, their analyses found that a \$1 increase in the local wage rate was associated

with a 0.07 percentage point decrease in the probability of attending college, while a 1% increase in the unemployment rate was related to a 0.02 percentage point increase in the probability of a student attending college. Similarly, Perna et al. (2005) assert that the state of Maryland's high unemployment rate, which ranged from 8.7% to 11.2% from 1990 to 1992, was at least partly responsible for a 43% increase in Black student enrollments at community colleges in the state.

### *Summary of Econometric Framework*

Many college enrollment studies are guided by econometric frameworks which suggest that students weigh their decisions to enroll in college against the costs and benefits of doing so, and that they consider the foregone earnings and opportunity costs associated with each of their options (Hossler, Braxton & Coopersmith, 1989; Perna, 2000). Therefore, many college access models include independent variables related to institutions' cost of attendance, students' ability to pay and the labor market context.

A review of the literature suggests that low-income and underrepresented minority students are less likely to enroll in college than higher-income, Asian and White students when tuition rates increase, and when need-based financial aid, particularly in the form of grants, decreases (Heller, 1997; St. John, 1990). Yet, despite this finding, need-based financial aid is decreasing in some states where non need-based, merit aid is assuming a larger proportion of state aid budgets, and at the federal level, where the purchasing power of the Pell Grant has decreased considerably over the last several decades (NASSGAP, 2006; St. John, 2005).

This review of econometric college enrollment frameworks also found that labor market forces influence college enrollment rates whereby a depressed labor market, as indicated by higher unemployment rates and lower wage rates, is related to increases in college enrollment rates (Kane, 1999; Manski & Wise, 1983; Perna et al, 2005). However, labor market fluctuations may have the greater impact on college participation rates in the public two-year sector, and little if any effect on enrollment rates at four-year institutions.

While traditional econometric models of college enrollment help to identify factors that influence the rates at which different groups of students matriculate in postsecondary education, they do not account for the impact of the pursuit of prestige, which has been undertaken by many colleges and universities, on students' enrollment patterns. Econometric theories also do not explain whether a relationship exists between institutional isomorphism and the degree to which diverse groups of students are represented in different types of institutions and within various postsecondary sectors. The next section of this chapter examines this phenomenon.

### *Institutional Framework*

Institutional theory provides an explanation for a familiar trend in higher education: the pursuit of prestige that has been prevalent among many of the nation's colleges and universities. This phenomenon is explained, at least partially, by one aspect of institutional theory, institutional isomorphism, which refers to a process whereby lower prestige organizations emulate the behaviors and adopt the practices of organizations that they perceive as being more elite in order to enhance their own status

(DiMaggio & Powell, 1983). This undertaking, which is also commonly referred to as academic drift, has resulted in certain types of institutions abandoning or significantly modifying their original missions, and in the postsecondary landscape becoming less diverse (Aldersely, 1995; Birnbaum, 1983).

Researchers posit that institutional isomorphism is consistent with another aspect of institutional theory which suggests that organizational fields, such as higher education, provide a context in which expectations are set and norms are established for their members, and in which member institutions constantly evolve in an effort to become or stay aligned with the industry's accepted standards (e.g., Riesman, 1956; Aldersley, 1995). However, the paradox of this rationale is that, as organizations continuously change, they eventually reach a threshold that renders them much more alike than different and which therefore diminishes the overall heterogeneity of the field (Berdhal, 1985; Morphew, 2002). Thus, previous studies show that in the beginning of their life cycles organizational fields tend to be very diverse, but that as they mature their individual units become more similar than different in the ways they operate, are structured and in the outputs they produce over time (Birnbaum, 1983; Morphew, 2004).

### *Institutional Isomorphism*

According to DiMaggio and Powell (1983) there are two types of isomorphism: competitive and institutional. Competitive isomorphism is most prevalent among organizations that operate in an open market and results in institutions becoming more alike over time because of pressures levied by external entities. The second form of isomorphism, and the type that is most directly related to the pursuit of prestige that has been evident in higher education, is institutional isomorphism. It supplements the basic

premise of competitive isomorphism by adding that organizations change, in large part, because of the direct and indirect influences of other similar organizations. Thus, DiMaggio and Powell emphasize the impact that organizations have on each other and suggest that this effect often drives competition between two entities “not just for resources and customers, but for political power and institutional legitimacy, [and] for social as well as economic fitness” (p. 150).

While there are two major forms of isomorphism, there are three processes by which isomorphic change occurs within a field (Bolman & Deal, 2003; DiMaggio & Powell, 1983). The first mechanism of change is coercive isomorphism which describes organizations that transform as a result of external forces that may come in a variety of forms including governmental mandates, societal pressures or legal requirements. Normative isomorphism is the second method by which organizations attempt to transform themselves. It is characterized by the professionalization of a given industry and suggests that individuals who develop a degree of expertise in a particular field are likely to shape the future of that profession with values, ideas and accepted standards of practice that result from their formal training. Finally, mimetic isomorphism most aptly describes the change process characteristic of colleges and universities that attempt to ascend the higher education hierarchy, and it involves one institution emulating the behaviors, actions or processes of another institution. Mimetic isomorphism also acknowledges that the entity being mimicked may be unaware of its role as the standard of excellence and/or may have no desire to be imitated (DiMaggio & Powell, 1983). In an environment of uncertainty where goals are unclear and policies and practices are complex, mimetic isomorphism offers a convenient way for an organization to enhance



its own operations by simply modeling its practices after those of an entity that is already considered to be successful (Bolman & Deal, 2003).

Haverman (1993) used institutional theory to examine the prevalence of diversification and mimetic behavior in the savings and loan industry. Her framework was based on sociological theories that explained the changing nature of organizational fields while also taking institutional, political and rational-choice processes into consideration. Haverman tested whether successful organizations that entered new markets were followed into those same markets by other less successful organizations. Her examination of the role of mimetic processes as a factor in whether businesses embarked upon new territory found that corporations were more likely to enter new arenas if other entities that they perceived as being more successful than themselves did so first. This premise can be applied to the field of higher education in that colleges and universities are more likely to mimic the behaviors of institutions they perceive as being more prestigious. This trend recently became evident as Princeton University, the University of Virginia and other institutions followed Harvard's lead and abolished their early admissions policies (Finder, 2006; Marklein, 2006).

Riesman (1956) was among the first researchers to apply the concept of isomorphism to higher education. He characterized institutional isomorphism as a "snake-like procession" in which institutions at the top of the postsecondary hierarchy act as the head of a coiled reptile and serve as an example for institutions in the middle and lower tiers that desire to move up in the sorting process, and to ultimately arrive at the place that the head currently occupies. Just as a snake's midsection follows suit if its head changes direction, Riesman suggested that many moderately selective colleges and

universities are likely to change course if their more elite counterparts do so. Finally, the author noted that while most institutions in the middle of the postsecondary hierarchy observe and emulate leading colleges and universities with an aim toward mirroring their success, some mid-tier colleges also remain keenly aware of the happenings at the lower levels of the system and become so impressed with how far along the continuum they have moved that they do not make additional attempts to progress any further.

Institutional isomorphism has also been evidenced in higher education as the universe of postsecondary institutions has become less diverse, and as an increasing number of colleges and universities have sought to enhance their status by becoming more selective, modifying their missions, and/or developing new graduate programs, as in the image of their more prestigious counterparts. The next section examines various examples of institutional isomorphism which typically involve less prestigious colleges and universities adopting the norms and practices characteristic of more highly regarded institutions (Aldersley, 1995; Morphew, 2002).

### *Institutional Diversity*

A diverse higher education system is valued in the United States because variety among institutional types is believed to foster efficiency, productivity and excellence, while responding to the wide-ranging needs of American society (Birnbaum, 1983). However, research suggests that the landscape of American higher education has become less rather than more diverse over time (Huisman, 1997; Morphew & Huisman, 2002). Birnbaum's (1983) comprehensive study of institutional differentiation which compared the number of distinct types of colleges and universities that existed in 1960 to the

number of different institutions that existed in 1980, substantiated this finding. His framework for this analysis was based on natural selection theory and used a three-stage process of variation, selection and retention to explain changes in the population of higher education institutions. Every college and university in eight states was included in the analysis which classified institutions into types, or species, according to the following six variables: control (public or private), highest level of degree awarded, program type (e.g., liberal arts, professional/technical, teacher education), enrollment size, sex (single-sex or co-educational) and proportion of minority students enrolled. The distribution of each institutional type among the entire population of higher education institutions was determined and a diversity index was calculated for each type. The 1960 diversity index for each institutional type was compared to its 1980 diversity index to determine whether or not the number of different types of colleges and universities within each category of institutions increased or decreased over the 20 year time frame, thus indicating whether the field of higher education institutions had become more or less diverse.

Birnbaum's (1983) findings revealed that, while the American system of higher education was still quite diverse in 1980, the number of distinct types of institutions within the field declined during the 20-year period studied. Although the actual number of colleges and universities increased by 44%, from 614 in 1960 to 885 in 1980, the number of unique institutional types decreased from 141 to 138. Additionally, the institutional type containing the most institutions increased from 8.6% (53 institutions) of the overall population of colleges and universities in 1960, to 13.9% (123 institutions) of the population in 1980. This 20-year trend indicates a greater degree of homogeneity within the field, which resulted in more colleges and universities comprising fewer

institutional types and in certain distinctive institutional categories, such as two-year private colleges and women's colleges, decreasing considerably. Birnbaum concluded that, by 1980, higher education had moved in the direction of replicating existing institutional types rather than creating new institutional categories and that the resulting lack of diversity among colleges and universities was marked by many institutions adopting comparable educational missions and teaching methods. He argued that this trend was consistent with ecological and organizational theories which suggest that individual organisms become more alike as the unique characteristics that make their environments distinct either become less prevalent or disappear altogether. This assertion is also aligned with other research which suggests that postsecondary institutions have become more alike because the competitive nature of higher education has increased prestige as its ultimate goal (Morphew, 2002).

### *Institutional Selectivity*

The primary tenets of institutional isomorphism, when applied to a higher education context, posit that colleges and universities mimic the practices of their more prestigious peers in order to enhance their own standing and that some postsecondary institutions view reaching the pinnacle of the research classifications and/or becoming more selective as ways of augmenting their status (Bolman & Deal, 2003; Koku, 1997). In this vein, several key findings emerged from an early set of studies that explored institutional isomorphism among postsecondary institutions. In their seminal study of isomorphism within a higher education context, in which they used the term "vertical extension" to refer to what is commonly termed institutional isomorphism, Schultz and

Stickler (1965) found that smaller colleges were more likely to implement changes with the intention of becoming more prestigious than were larger institutions. Similarly, public colleges and universities engaged in academic drift by adding new graduate programs more often than their private counterparts. These findings align with those from one of the earliest studies on the topic conducted by McConnell (1962) which concluded that academic drift was primarily an attempt for less-prestigious and less-selective schools to move up the institutional hierarchy. McConnell also argued that the hierarchical nature of postsecondary education traditionally attributed higher status to research universities than to regional and comprehensive institutions.

In a more recent examination of academic drift, Aldersley (1995) investigated the degree to which colleges and universities experienced an upward shift from one Carnegie classification to another during two time periods: from 1976 to 1987 and from 1987 to 1994. His analysis revealed that 47 public and 13 private universities became Research Universities I (RU1) or Research Universities II (RU2), the most research-intensive and arguably the most highly esteemed Carnegie classifications, over both time periods, while 46 and 28 public and private universities, respectively, moved into the Doctoral Universities I (DU1) and Doctoral Universities II (DU2) categories. When compared to private universities, then, public institutions seemed to be more motivated to improve their standing and to move into higher Carnegie classifications. Aldersley contends that upward shifts that result in institutions moving into higher Carnegie categories confirm that many colleges and universities perceive moving into a more research intensive Carnegie category as one way of becoming more elite. He suggests that “despite pressures to re-emphasize the role of undergraduate education, ambitious institutions are

apparently still beguiled by the promise of prestige associated with doctorate-level education” (Aldersley, 1995, p. 56). Thus, as Morphew and Baker (2004) suggest, the Carnegie classification system has assumed the role of a “prestige barometer” for many institutions, although that was never its intended purpose.

In a similar study of academic drift, Morphew (2002) examined whether certain kinds of institutions were more likely than others to engage in isomorphic activities. Based upon the premise that some colleges and universities mimic their more elite peers in order to be perceived as more legitimate by external entities, Morphew hypothesized that less selective institutions would be more likely to change their names from “College X” to “University X” than more selective institutions. His findings showed that of the 105 institutions that changed their names from “College X” to “University X” between 1990 and 1998, 61 institutions, or nearly 60% of the population, were in the moderately difficult selectivity category according to *Peterson’s Guide to Four-Year Colleges*. The remaining 44 institutions that changed their names were classified as either minimally difficult or noncompetitive, the two least selective categories. None of the institutions in either of the two highest selectivity groups, most or very difficult, converted from a college to a university. Thus, consistent with findings from the earliest studies on academic drift (e.g., McConnell, 1962; Schultz & Stickler, 1965), Morphew concluded that one of the characteristics that is indicative of whether or not an institution will change from a college to a university is its level of selectivity. This finding substantiates a major tenet of institutional theory which posits that some organizations modify their behaviors and practices in order to make them more similar to those of more elite institutions within a particular organizational field.

While some research studies have examined the relationship between an institution's selectivity level and whether it engaged in isomorphic behaviors, Dey, Milem and Berger (1997) analyzed whether trends in faculty members' productivity levels, which may also be considered a measure of institutional selectivity, were related to isomorphic patterns. The researchers used longitudinal data from three faculty surveys to compare trends in the relationship between postsecondary institutional types and faculty members' publication rates between 1972 and 1992. Dey, Milem and Berger's multivariate analyses revealed that over the 20-year period studied, there was a statistically significant increase in the number of publications produced by faculty employed at all institutional types. However, comprehensive and doctoral universities had the largest increases in publication productivity over the period studied, while research universities experienced the smallest increases. These findings are similar to those produced by other studies which found that less selective institutions and those in less research-intensive Carnegie classifications were more likely to exhibit isomorphic behavior patterns than were more selective institutions or those in the Research Universities I Carnegie category (Morphew, 2000; Morphew & Baker, 2004).

Dey, Milem and Berger's (1997) findings also support the concept of institutional isomorphism in that even institutions such as community colleges and liberal arts colleges which traditionally focused on teaching, presumably adapted their missions so that they were more aligned with those of research institutions at the top of the higher education hierarchy. One could conclude that the substantial increase in faculty publishing rates at comprehensive and doctoral institutions suggests that mid-tier

universities view emphasizing the importance of scholarly research as one means of enhancing their status and of becoming like more prestigious institutions.

While Aldersley (1995) and Morpew (2002) found institutional selectivity to be both a motive for and an indicator of which colleges or universities would engage in isomorphic behaviors, Hearn (1991) found that an institution's selectivity level was also correlated with the types of students it enrolled. Hearn conducted multiple regression analyses on student-level data obtained from the High School and Beyond Survey, and institutional-level data from the National Center for Education Statistics and the Higher Education Research Institute to examine factors that influenced the selectivity and spending levels of the college destinations of high school graduates. His findings showed that students' background characteristics (e.g., race/ethnicity, gender, parental education levels) and academic characteristics (e.g., standardized test scores, high school curriculum, educational expectations) were related to the selectivity levels of the colleges and universities they attended. Hearn's analyses also revealed that Blacks and low socioeconomic status students were more likely than others to attend lower-selectivity institutions. This finding suggests that more selective institutions, or institutions that engage in isomorphic activities with the goal of becoming more selective, may have lower equity indices for underrepresented students.

### *Institutional Resources*

Prior research suggests that the ways in which colleges and universities allocate and distribute their resources may be indicative of whether they have or will engage in isomorphic activities (Harter, Wade & Watkins, 2005; Santos, 2006). To this end,



Morphew and Baker (2004) analyzed the spending patterns of institutions that were new to the Research Universities I (RU1) Carnegie classification in 1994. Between the 1987-1988 academic years and the 1994-1995 academic years the RU1 category increased from 70 to 88 institutions, the largest increase in both the number and percentage of institutions in this category since the Carnegie classification system's inception in 1970. Morphew and Baker suggest that the substantial growth in the RU1 category was reflective of postsecondary institutions' persistent efforts to mimic the most elite university models. In their study, the researchers examined whether becoming an RU1 resulted in universities spending more in the institutional support and research categories and less in the instruction category. Morphew and Baker also explored if prior to and after becoming an RU1 the spending patterns of rising RU1s (institutions that entered the RU1 category during the period studied) became more similar to those of continuing RU1s (institutions that were in the RU1 category since the beginning of the period studied), with a greater proportion of their budgets being allocated to administrative costs. The significance of these analyses is supported by Alpert's (1985) assertion that as postsecondary institutions come to rely more heavily on external sources of support such as research funding their internal spending patterns become more aligned with programmatic and operating functions that are closely related to those new sources of support (e.g., graduate education and research administration), and a smaller proportion of their expenditures is allocated to other areas such as undergraduate education and/or instruction. Similarly, Clotfelter (1996) posits that universities that attempt to become more research centered, in an effort to be considered in the same league as some of their

more prestigious peers, should anticipate increased costs, especially in the administrative staffing category.

Morphew and Baker's (2004) study of changes in the expenditure patterns of new Research I Universities found that, over the 20 year period from 1976 to 1996, rising RU1s increased their spending in the institutional support and research categories by 10% and 29%, respectively, and decreased spending in the instructional category by 12%. Comparatively, RU2s decreased the proportion of their budgets devoted to institutional support by 5%, increased the amount allocated to research by 8%, and maintained the proportion of their budgets allocated to instruction. The findings of these descriptive analyses confirm the researchers' hypothesis that rising RU1s increase their spending on institutional support and research activities while decreasing their instructional expenditures. However, the multivariate analyses that examined the effect of a set of independent variables (i.e., total revenues, restricted revenues, enrollment, 1994 Carnegie classification, and control [private or public]) on allocations to institutional, instructional and research spending categories resulted in mixed support for the aforementioned hypothesis. These analyses showed that when compared to rising RU1s, RU2s spent significantly more on institutional support and significantly less on instruction. The multivariate model also showed that the percent of an institution's budget that was in the form of restricted revenue was negatively related (-0.53) to instructional expenditures and positively related (0.54) to research expenditures, which suggests that among both RU1s and RU2s institutions spent less on instruction and more on research when a larger proportion of their revenue was in the form of restricted funds. Additionally, an interaction variable which measured change over time found that instructional spending

increased at a significantly faster rate at RU2s than at rising RU1s. A separate model, which included the same independent variables as the previously discussed model, compared the spending patterns of rising RU1s with those of continuing RU1s and found that expenditures at rising RU1s mimicked the spending patterns of their continuing RU1 peers, and resulted in the rising RU1s increasing their spending levels in the institutional support category to such a degree that by 1996 they were spending more in this category than their continuing RU1 peers, even though in 1976 the rising RU1s spent significantly less than the continuing RU1s on institutional support. The multivariate analyses also showed that over the period studied, instructional cost expenditures at rising RU1s decreased and more closely mirrored instructional spending at continuing RU1s despite the fact that in 1976 the rising RU1s spent significantly more on instruction.

#### *Summary of Institutional Framework*

Much of the research that applies institutional theory to higher education settings identifies institutional isomorphism as the process by which some postsecondary institutions mimic the behavior of more prestigious colleges and universities in order to enhance their own status (Reisman, 1956; Bolman & Deal, 2003). In the higher education arena, where the research university is still perceived as the pinnacle of the postsecondary hierarchy, institutional isomorphism is typically undertaken by less selective institutions and/or by those that seek to enter a more research-intensive Carnegie classification.

Prior research that has used an institutional framework to examine particular outcomes at colleges and universities have found that institutions that exhibit isomorphic

behaviors (e.g., moving from one Carnegies classification to another) typically experience shifts in their spending patterns that result in more spending in institutional support and research categories, and less spending on instruction (Morphew & Baker 2004). Institutional isomorphism is also cited as one reason for the increased homogeneity of the higher education landscape which has resulted in fewer institutional types, and in some colleges and universities modifying their missions (e.g., shifting their emphasis from teaching to research) so that they are more aligned with those of the most prestigious institutions (Birnbaum, 1983; Dey, Milem & Berger, 1997; Morphew, 2002).

### Summary

This literature review highlights four key points. First, it demonstrates the importance of measuring equity in enrollments for groups that have traditionally been underrepresented in postsecondary education. Studies that have calculated equity indices for Black and Latino students have found these groups to be disproportionately underrepresented in the public four-year sector (Bensimon et al., 2006; Perna et al., 2006). Second, this chapter identifies several key factors (e.g., availability and type of financial aid, tuition, unemployment rates) that are related to college-going rates and students' college choice decisions. Third, this literature review demonstrates how institutional isomorphism explains the phenomenon of the pursuit of increased status and prestige which has been prevalent among higher education institutions for the past several decades. Research suggests that certain institutional actions, such as shifting resources from instructional to research activities, are indicative of institutions that seek to enhance their status by mimicking the behaviors of their aspirational peers. Finally, and perhaps

most notably, this literature review highlights how a theoretical framework which combines econometric and institutional theories can be applied to college access models to determine how these approaches work jointly to impact enrollment equity indices for underrepresented students.

This study of the status of equity in undergraduate enrollments for Black, Latino and low-income students at public four-year institutions extends current research on the status of equity for groups that have traditionally been underrepresented in higher education. In addition to examining the effect of traditional indicators of college enrollment on the equity indices, I also test whether measures that are indicative of institutional isomorphism affect the equity indices for public four-year colleges and universities. Based on this literature review and the theoretical frameworks that guide this study, I predict that variables typically included in traditional college enrollment frameworks, as well as variables related to isomorphic behaviors, will affect institutions' equity indices.

## CHAPTER 3

### RESEARCH DESIGN AND METHODOLOGY

#### Introduction

This study builds on the work of Bensimon et al. (2006) Perna et al. (2006) by examining the status of equity in undergraduate enrollments for African American, Latino and low-income students at the nation's public four-year universities, with a particular interest in the status of equity for these groups at public flagship campuses. It also adds to prior research by Perna et al. (2005) by exploring the relationship between institutional and state-level variables on student enrollment rates in the postsecondary sector. I use an integrated conceptual model based on econometric and institutional theories to examine the degree to which students from the aforementioned groups are equitably represented among college students in the public four-year postsecondary sector, and to determine if institutions' isomorphic behaviors and tendencies affect and/or are related to their equity indices. The equity indices for underrepresented minority and low-income students attending all public-four year universities, with the exception of the flagship campus, in the aggregate in a state are compared to the to the equity indices for students from these groups attending the public flagship campus in each respective state. Descriptive analyses are used to determine and compare the status of equity in undergraduate enrollments for African American, Latino and low-income students in three areas: 1) for public four-year universities across the 50 states, 2) for public flagship universities across the 50 states, and 3) between flagships and non-flagships within the same state. This study also uses descriptive analyses to examine trends in equity indices

at public four-year universities over a ten-year period of time. Multivariate analyses are used to explore sources of variations in the enrollment equity indices between non-flagships, flagships, and highly selective flagships across the 50 states. More specifically, the following four research questions are addressed:

1. How does the status of equity in undergraduate enrollments for Black, Latino and low-income students at all public four-year universities compare to the status of equity in undergraduate enrollments for these students at public flagship universities?
2. How do trends in equity in undergraduate enrollments for Black, Latino and low-income students at all public four-year universities between 1994 and 2004 compare to trends in equity in undergraduate enrollments for these students at public flagship campuses over the same period?
3. What variables shaped by human capital and institutional isomorphism are associated with the equity indices for Black, Latino and low-income students at public four-year universities and public flagship campuses?
4. Is an institution's flagship status related to its equity indices for Black, Latino and low-income students?

The next section of this chapter provides an overview of the population that serves as the focus of the study's analyses. The remaining sections describe the data that are used to conduct the study's analyses, the conceptual model that serves as the framework for the analyses, the statistical analyses that are performed, and the study's limitations and delimitations.

## Population

This study calculates and compares enrollment equity indices for Black, Latino and low-income students attending public four-year universities. The dataset used includes nearly every public four-year, degree-granting postsecondary institution in the United States. The Integrated Postsecondary Education System (IPEDS) is the source of most of the institutional-level data included in the study. IPEDS includes data for 1994 and 2004, the years of interest for this study, for 616 and 651, respectively, public four-year, degree-granting colleges and universities located in the United States. However, because I calculate equity indices for Black and Latino first-time, full-time freshmen, 69 institutions in the 1994 IPEDS database and 66 institutions in the 2004 IPEDS database were excluded from this study's dataset either because they are upper-level campuses that do not enroll first-time, full-time freshmen (e.g., University of Baltimore, University of California San Francisco) or because they are medical or graduate schools (e.g., City University of New York Graduate School and University Center, University of Nebraska Medical School). Six additional institutions were excluded from the dataset because they are United States Service Academies that are funded by the federal government and not state governments. Thus, the datasets for this study include 541 institutions for the 1994 analyses and 579 institutions for the 2004 analyses. The public four-year institutions that are included in the study are listed in Appendix A and the public four-year institutions that are excluded from the study are listed in Appendix B. IPEDS is explained more extensively in the data section of this chapter.

Comparing the enrollment equity indices for all public four-year universities and public flagship campuses is a key element of this study. Therefore, I follow the example



of prior research (e.g., Mortenson, 2004; Washington Higher Education Coordinating Board, 2005) to identify 50 flagships, one for each state, which comprise the comparison group of the study. The flagships included in this study are listed in Table 1.

### Statistical Model and Methodology

This study focuses on the status of equity in undergraduate enrollments for Black, Latino and low-income students at public four-year universities in each state and across states, and at public flagship universities in each state and across states. Descriptive statistics are used to address the first two research questions, and multivariate regression analyses are used to address the third and fourth research questions.

#### *Research Question One*

*How does the status of equity in undergraduate enrollments for Black, Latino and low-income students at all public four-year universities compare to the status of equity in undergraduate enrollments for these students at public flagship universities?*

To address this question, three equity indices, one for each student group, are calculated for 2004 for all public four-year institutions in the aggregate in each state, with the exception of the flagship university. Three additional equity indices, one for each student group, are also calculated for the public flagship university in each state. These procedures result in six equity indices for each state. Differences in equity are examined by comparing the equity indices for each group at all public four-year universities and the flagship campus in each state, and across and between public four-year universities and flagship campuses throughout the country.

Table 3.1. The 50 Public Flagship Universities

<u>Institution Name</u>	<u>State</u>
1. University of Alaska – Fairbanks	Alaska
2. University of Alabama – Tuscaloosa	Alabama
3. University of Arkansas – Fayetteville	Arkansas
4. University of Arizona	Arizona
5. University of California – Berkeley	California
6. University of Colorado – Boulder	Colorado
7. University of Connecticut	Connecticut
8. University of Delaware	Delaware
9. University of Florida	Florida
10. University of Georgia	Georgia
11. University of Hawaii – Manoa	Hawaii
12. University of Iowa	Iowa
13. University of Idaho	Idaho
14. University Illinois – Urbana Champaign	Illinois
15. Indiana University – Bloomington	Indiana
16. University of Kansas	Kansas
17. University of Kentucky	Kentucky
18. Louisiana State University	Louisiana
19. University of Massachusetts – Amherst	Massachusetts
20. University of Maryland – College Park	Maryland
21. University of Maine	Maine
22. University of Michigan – Ann Arbor	Michigan
23. University of Minnesota – Twin Cities	Minnesota
24. University of Missouri – Columbia	Missouri
25. University of Mississippi	Mississippi
26. University of Montana	Montana
27. University of North Carolina – Chapel Hill	North Carolina
28. University of North Dakota	North Dakota
29. University of Nebraska – Lincoln	Nebraska
30. University of New Hampshire	New Hampshire
31. Rutgers University – New Brunswick	New Jersey
32. University of New Mexico	New Mexico
33. University of Nevada – Reno	Nevada
34. State University of New York – Buffalo	New York
35. Ohio State University	Ohio
36. University of Oklahoma – Norman Campus	Oklahoma
37. University of Oregon	Oregon
38. Pennsylvania State University	Pennsylvania
39. University of Rhode Island	Rhode Island
40. University of South Carolina – Columbia	South Carolina
41. University of South Dakota	South Dakota
42. University of Tennessee – Knoxville	Tennessee
43. University of Texas – Austin	Texas
44. University of Utah	Utah
45. University of Virginia	Virginia
46. University of Vermont	Vermont
47. University of Washington	Washington
48. University of Wisconsin – Madison	Wisconsin
49. West Virginia University	West Virginia
50. University of Wyoming	Wyoming

### *Research Question Two*

*How do trends in equity in undergraduate enrollments for Black, Latino and low-income students at all public four-year universities between 1994 and 2004 compare to trends in equity in undergraduate enrollments for these students at public flagship universities over the same period?*

To address this research question, three additional enrollment equity indices, one for each student group, are calculated for 1994 for public four-year universities in the aggregate with the exception of the flagship campus, in each state, and for the public flagship university in each state. This results in six additional equity indices for each state. Institutions, or groups of institutions, that experienced increases in their equity indices for these student groups over the 10-year period are considered to have broadened access for underrepresented students, and institutions, or groups of institutions, that experienced decreases in their equity indices for these groups over the 10-year period are considered to have narrowed or restricted access for underrepresented students. Differences between the 2004 and 1994 equity indices for public four-year universities in each state are compared to differences between the 2004 and 1994 equity indices for public flagship universities in that same state. Differences in equity for Black, Latino and low-income students at both institutional types are also compared across all 50 states.

### *Research Question Three*

*What measures of human capital and institutional isomorphism are associated with equity indices for Black, Latino and low-income students at public four-year universities and public flagship campuses?*

I use multivariate regression analysis to address the third research question as it is the most appropriate statistical technique to use when examining the predictive ability of two or more independent variables on one continuous variable (Pallant, 2005). Multiple

regression can also be used to compare the predictive ability of various independent variables and to determine which variables predict a particular dependent variable. The partial model outlined below in equation 2 is used to examine predictors of equity in student enrollments in 2004 at all public four-year universities in the aggregate, and at public flagship universities. The results of the multivariate regression analyses demonstrate which of the conceptual model's variables have a statistically significant effect on institutions' enrollment equity indices for underrepresented students. The independent variables in the partial model include measures of human capital and institutional isomorphism. The dependent variables are the enrollment equity indices for Black, Latino and low-income students. All public four-year universities in each state, with the exception of the flagship campus, have the same equity index, which is an aggregated equity measure, for each of the three student groups. The public flagship in each state has its own equity index for each of the three student groups.

Partial Model for Predicting Enrollment Equity Indices <span style="float: right;">(2)</span>
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Enrollment Equity Index = Human Capital Variables + Institutional Isomorphism Variables
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*Research Question Four*

*Is an institution's flagship status related to its equity indices for Black, Latino and low-income students?*

Multivariate analyses are used to address this research question. Two separate dummy variables, flagship and highly selective flagship, are added to the partial model to determine if flagship status (i.e., flagship and highly selective flagship) has a statistically significant effect on institutions' 2004 equity indices. The flagship variable designates all 50 public flagship universities as flagships (flagship=1) and all other public four-year

institutions as non-flagships (flagship=0). The highly selective flagship designates highly selective flagship institutions, as determined by *U.S. News and World Report*, as highly selective flagship =1, and all other public four-year institutions as non highly-selective flagships (highly selective flagship=0). The variables are explained more fully in a subsequent section of this chapter. The multivariate analyses also explore whether the conceptual model's ability to explain variance in institution's equity indices increases when the flagship variables are added. The full regression model which includes the flagship variables is outlined below in equation 3. The individual human capital, institutional isomorphism and flagship variables that comprise the model are explained more fully in a subsequent part of this chapter. As with the previous research question, all public four-year universities in each state, excluding the flagship, have the same equity index, and the flagship campus in each state has its own equity index for each student group.

<p>Full Model for Predicting Enrollment Equity Indices <span style="float: right;">(3)</span></p> <p style="text-align: center;">Enrollment Equity Index = Human Capital Variables + Institutional Isomorphism Variables + Flagship Status Variables</p>
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### Conceptual Model and Variable Description

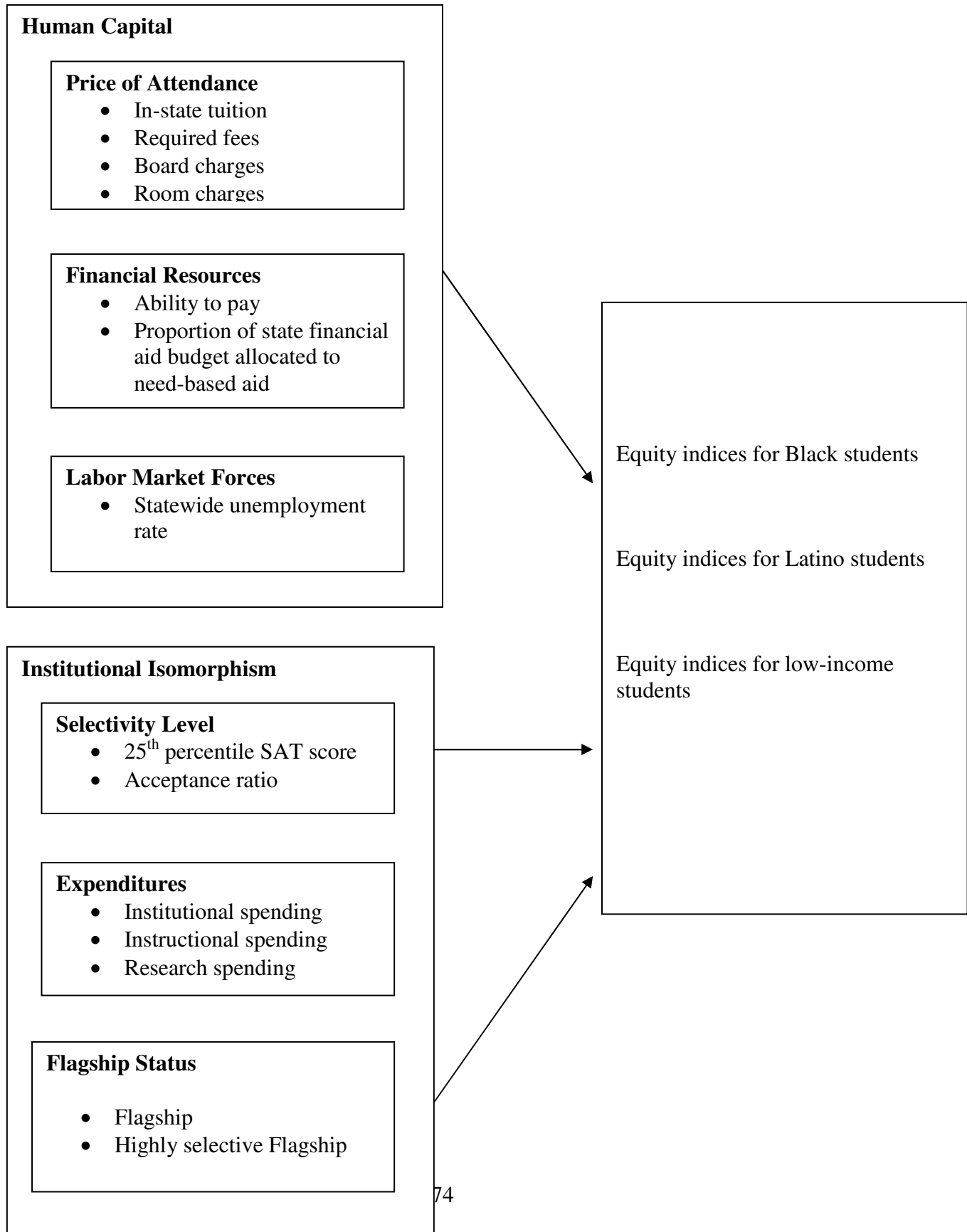
This study uses an integrated conceptual model that combines tenets of a college enrollment framework based on econometric theory with aspects of an institutional isomorphism framework that is based on institutional theory. The integrated conceptual model predicts that human capital variables and measures of institutional isomorphism, including flagship status, shape equity indices for underrepresented student populations at

public four-year universities. Variables included in the human capital and institutional isomorphism categories serve as the model's independent variables, and the enrollment equity indices for Black, Latino and low-income students are its dependent variables.

A review of the college enrollment and choice literature suggests that several factors affect students' decisions to attend college and influence their choice of which institution to attend. These variables, in turn, affect the types of students that enroll at a given institution and influence that institution's equity indices for various groups of students. The human capital category of this study's conceptual model includes measures of the following college access and choice variables: cost of attendance, financial factors and labor market forces.

The literature review of suggests that colleges and universities that seek to enhance their prestige levels are likely to engage in certain types of isomorphic behaviors such as becoming more selective and altering their spending patterns. The study's conceptual model predicts that such patterns will also affect institutions' equity indices. The following variables are included in the conceptual model's institutional isomorphism category: selectivity level, institutional spending in various categories, and flagship status. Figure 2 provides an expanded illustration of the integrated conceptual model which includes the main categories of variables within the human capital and institutional isomorphism categories, and the individual variables that are nested within each category. Each variable is explained more fully in the next section.

Figure 2.1. Expanded Conceptual Model for Access to Public Four-Year Institutions.



## *Independent Variables*

### *Human Capital Category*

The human capital category includes independent variables that measure price of attendance, financial resources and labor market forces. Research suggests that students weigh a number of factors when deciding whether or not to pursue postsecondary education, and the variables included in this category are related to the opportunity costs and foregone earnings associated with attending college.

#### *Price of Attendance.*

Four continuous variables measure the price of attendance for each institution in the study's dataset: in-state tuition, required fees, room charges and board charges. The data for these four variables are obtained from IPEDS.

The tuition variable is measured by the dollar amount that students are responsible for paying, before receiving any financial aid, in exchange for instructional services on an annual basis. Institutions can charge tuition on a per-term, per-course or per-credit basis. Prior research has found that tuition increases are typically correlated with enrollment decreases (Heller, 1999; Leslie & Brinkman, 1987; McPherson & Schapiro, 1996).

While tuition is usually the largest expense associated with attending college, the price of enrolling at a particular institution also includes other notable costs such as mandatory fees, and room charges board charges. The second price of attendance variable in this study is mandatory fees and it is measured using the set dollar amount that is charged to students for costs that are not covered by tuition such as student activity and recreation fees.



The last two variables in the price of attendance category are board charges and room charges. Board charges are measured by the average dollar amount that students incur to eat meals in an on-campus dining facility for an academic year. Room charges are measured by the average dollar amount that students are responsible for paying for typical on-campus housing accommodations for an academic year.

### *Financial Resources.*

The financial resources category is comprised of two continuous variables. The first variable measures families' ability to pay the average cost of attending college in each of the 50 states. The second financial resources variable measures a state's commitment to need-based financial aid.

The first variable in the financial resources category is families' ability to pay. This variable is a measure of the percent of the average family's income, in a given state, needed to pay the net price of attendance (i.e., amount of college expenses less financial aid) at public four-year colleges and universities in that same state. For each state, family incomes are divided into five quintiles and the average of the five income quintiles becomes the income amount used to calculate the ability to pay variable (National Center for Public Policy and Higher Education, 2006). According to the College Board (2005) the percentage of a low-income family's income, (those who earned less than \$17,900 annually), necessary to pay the net cost of attendance at a public four-year university increased from 29% in 1992-1993 to 37% in 2003-2004. For upper-middle income families (those who earned more than \$75,000 annually) the percentage of income needed to pay the net cost of attendance at public four-year universities remained stable

at 13%, and for high-income families (those who earned more than \$142,800 annually) the percentage of income necessary to pay attendance costs increased from 6% to 7%. Similarly, Gerald and Haycock (2006) found that, after factoring in all grant aid the average remaining costs associated with attending a public, research-extensive university, were equal to 80% of a low-income student's annual family income. The Carnegie classification system's public, research-extensive category includes 44 of the 50 public flagship institutions. The same remaining costs were equivalent to a more reasonable proportion, 12%, of a high-income student's yearly family earnings. Gerald and Haycock's analysis classified low-income students as those from families that earned less than \$20,000 per year and high-income students as those from families that earned more than \$100,000 annually.

The second financial resources variable is a ratio between the proportion of a state's financial aid budget that is allocated to non need-based aid, which is typically distributed to students in the form of merit scholarships, and the total amount of a state's financial aid budget. As a result of their examination of statewide merit aid programs in Florida and Michigan, Heller and Schwartz (2002) concluded that a majority of students who received these scholarships were not from low-income families, and that African American students in both Florida and Michigan as well as Latino students in Michigan were underrepresented among merit aid recipients. Additional research confirms this finding and suggests that students who are underrepresented in higher education (e.g., Blacks, Latinos, low-income students) are also most likely to be underrepresented among those who are eligible for and receive merit aid (Farrell, 2004; Heller & Rogers, 2003).

### *Labor Market Forces.*

The last variable in the human capital category is the statewide unemployment rate for each of the 50 states. The unemployment rate is a representation of the number of unemployed individuals as a percentage of the entire labor force (Bureau of Labor Statistics, 2007). The statewide unemployment rates for 2004 are included in the model.

Prior research suggests that the ability to secure jobs in the labor market affects students' college enrollment decisions, which in turn affect the composition of a college or university's student population and an institution's equity indices. Kane (1999) found that a one percentage point increase in a state's unemployment rate was correlated with a 1% increase in enrollments at public colleges and universities.

### *Institutional Isomorphism Category*

The institutional isomorphism category includes independent variables that measure institutions' selectivity levels, expenditures and flagship status. Prior analyses suggest that institutions that desire to enhance their standing relative to other institutions engage in certain behavior patterns. Research also indicates that some flagship universities are among the institutions that have engaged in isomorphic activities over the last several years which have resulted in their admissions practices becoming more selective and their student populations less diverse (Gerald & Haycock, 2006; Turner & Pusser, 2004).

### *Selectivity.*

Two variables are used to measure an institution's selectivity level: 25<sup>th</sup> percentile SAT score and acceptance ratio. This study uses a composite of the 25<sup>th</sup> percentile math and verbal SAT scores of an institution's entering freshmen to measure its selectivity level. Institutions report their 25<sup>th</sup> percentile math and 25<sup>th</sup> percentile verbal SAT scores separately to IPEDS. I created a 25<sup>th</sup> percentile composite SAT score for each institution by averaging its math and verbal scores. In cases where institutions report American College Test (ACT) scores instead of SAT scores, their 25<sup>th</sup> percentile math and verbal ACT scores were averaged into a 25<sup>th</sup> percentile composite ACT score, which was then converted into an equivalent SAT composite score using a scale developed by Dorans, Lyu, Pommerich and Houston (1997). This scale is also used by the College Board to compare and convert ACT and SAT scores (College Board, 1999). Astin and Oseguera (2005) found that, after controlling for 33 background and academic characteristics (e.g., grade point average, parental education, parental income and race), SAT scores was the variable most likely to predict whether or not a student enrolled in a highly selective university. Additionally, in an earlier study, Manski and Wise (1983) found that a composite of students' SAT scores and class rank was the strongest predictor of students' college choice decisions and institutions' admissions practices.

Acceptance ratio is the second selectivity variable included in the conceptual model. It is a continuous measure that compares the IPEDS *applicant* variable, which is the number of students who fulfilled the requirements (i.e., completed an application, paid admissions fee or submitted an admissions payment waiver) necessary to be considered for admission in the next freshman class at a particular institution and

received an admissions decision (i.e., admitted, not admitted, placed on waiting list), with the IPEDS *admissions* variable which is the number of students that were extended an offer to enroll in the next freshman class at that particular institution. According to *Barron's Profiles of American Colleges and Universities* (2006), institutions that accept less than one-third of their applicants are considered highly competitive (selective).

### *Expenditures.*

The conceptual model's isomorphism category includes three measures of institutional expenditures which are all continuous variables collected through IPEDS: the proportion of an institution's spending allocated to institutional support, the proportion of an institution's spending allocated to instructional activities and the proportion of an institution's spending allocated to research activities.

The institutional support category includes expenditures related to the daily operations of a college or university such as general administrative and logistical services, fiscal operations, space management, and some information technology services (IPEDS, 2006). Prior research suggests that some institutions concentrate on developing new doctoral programs and expanding their research activities as one means of increasing their status among other colleges and universities, and that this approach to moving up the higher education hierarchy results in more spending in the administrative and institutional support categories (Clotfelter, 1996; Morphew & Baker, 2004). For example, in their analysis of trends in institutional spending from 1976 to 1996, Morphew and Baker (2004) found that rising Research I Universities increased their spending in the institutional support category by 10% while simultaneously decreasing

spending in the instructional category by 12%. The institutional spending variable is measured by the dividing the dollar amount spent in the institutional support category by the total amount of expenditures for the 2004-2005 academic year.

The instructional category includes expenses for all academic divisions and units of a college or university, and for all credit and non-credit courses and activities held during regular, special and extended sessions (IPEDS, 2006). This variable is measured by dividing the dollar amount spent on instructional activities by the total amount of institutional expenditures for the 2004-2005 academic year. Expenditures for academic administration are excluded from this category. When comparing institutions' spending in the instructional category, Morpew and Baker (2004) found that over a 20-year period, institutions that remained classified as Research Universities II increased their instructional expenditures at a significantly faster rate than institutions that shifted from the Research University II category to the Research University I category. The authors also found that overall, instructional spending at the rising RUIs decreased over time.

The research spending variable is measured by dividing the dollar amount spent on research activities specifically designed to produce research outcomes by the total amount of institutional expenditures in the 2004-2005 academic year. The IPEDS research category includes special research centers and institutes, studies commissioned by external agencies, projects budgeted by a department or unit within an institution, and information technology expenses related to research activities (IPEDS, 2006). Alpert (1985) suggests that as colleges and universities become more dependent on external revenue sources such as research grants their spending patterns will reflect those new sources of support. This shift in expenditures is likely to result in a greater proportion of

institutions' budgets being allocated to research activities while a smaller proportion of their budgets is allocated to instructional activities. This assertion was supported by Morpew and Baker's (2004) analysis of Research University II's that shifted into the Research University I category over time. From 1976 to 1996, these institutions increased their research related expenditures by 29% while simultaneously decreasing their instructional related expenditures.

### *Flagship Status.*

The flagship status variable includes two independent dummy variables, flagship and highly selective flagship. Both dummy variables are included in the regression models. The reference group for the flagship variable is all non-flagship institutions, and the reference group for the highly selective flagship variable is all institutions, including some flagships, that are not considered highly selective in terms of their admissions requirements and levels of prestige. The process for selecting the highly selective flagship institutions is discussed more fully in the data section of this chapter. The flagship variables are included in the conceptual model based on a review of the literature which suggests that many flagship universities have become increasingly selective, and their student populations less diverse, over the last several decades (Gerald & Haycock, 2006; Turner & Pusser; 2004). This premise is aligned with Turner and Pusser's (2004) assertion that "patterns of under-representation, and the inequitable distribution of access, constitute a considerable challenge to selective public universities that have long made providing key public benefits...fundamental components of their missions" (p. 389). To safeguard against multicollinearity between the flagship and highly selective flagship

variables, and other variables (i.e., research expenditures, SAT scores) in the conceptual model, Pearson correlation coefficients were calculated to determine the direction and magnitude of the relationship between all variables in the model. Tabachnick and Fidell (2001) caution against including two variables with a correlation coefficient of .70 or more in the same regression model. The correlations between the flagship variable and the other variables in the conceptual model did not exceed the .70 threshold, and the strongest coefficient between flagship status and another variable (research expenditures) was .49. Similarly, the correlation coefficients for the highly selective flagship variable and the other variables in the conceptual model did not exceed .70, and the strongest coefficient between highly selective flagship and another variable in the model (25<sup>th</sup> percentile SAT scores) was .25. The correlation coefficients between the flagship and highly selective flagship variables and the other variables in the conceptual model are included in Appendix C.

### *Dependent Variables*

Equity indices for Black, Latino and low-income students serve as the study's dependent variables. Separate equity indices for each group are calculated for all public four-year institutions in the aggregate (excluding flagships) and for the public flagship university in each state.

### *Calculating Equity Indices*

Equity indices are calculated so that comparisons in the degree to which different groups of students are represented at various institutional types at different points in time



can be made. Following the example of Bensimon et al. (2006) and Perna et al. (2006) ratios are used to determine the extent to which Black, Latino and low-income student populations achieved equity in undergraduate enrollments in 1994 and 2004, at different types of institutions within the same state and across states. Equitable access for Blacks and Latinos is achieved when the proportion of Black and Latino first-time, full-time freshmen at a particular institution or group of institutions is equal to the proportion of public high school graduates from these groups in each respective state. Equitable access for low-income students is achieved when the proportion of Pell Grant recipients enrolled at a particular postsecondary institution or group of institutions is equal to the proportion of 18-24 year-old high school graduates in each state from low-income families. For the 1994 and 2004 descriptive analyses, the reference group for Pell Grant recipients is 18-24 year old high school graduates from families that earned less than \$30,000 and \$40,000 per year, respectively. According to the End of Year Pell Grant Reports produced by the U.S. Department of Education (1995, 2005), 92.2% of students who received Pell Grants in the 1994-1995 academic year came from families that earned less than \$30,000 per year, and 91.4% of students who received Pell Grants in the 2004-2005 academic year came from families that earned less than \$40,000 per year. When full equity for any group is achieved the equity index is 1.0. An equity index of less than 1.0 indicates that a group is below equity in undergraduate student enrollments at an institution or group of institutions, and an equity index above 1.0 suggests that a group is overrepresented among students at an institution or group of institutions.

For first-time, full-time enrollments among Black and Latino students I use the proportion of Black and Latino public high school graduates in a state, in a given year, as

the relevant reference population. For the 1994 indices I use actual high school graduate numbers provided by the Western Interstate Commission for Higher Education (WICHE), and for the 2004 indices I use WICHE's high school graduate projections. Using high school graduates from each group as the reference population controls for racial/ethnic differences in college eligibility, whereas a broader reference group such as all 18-24 year-olds in a state, would not control for such differences (Perna et al., 2006). As illustrated in equations (4) and (5), equity in undergraduate enrollments for Black and Latino freshmen, relative to all freshmen enrolled at each institutional type, is defined as:

<p>Enrollment Equity Index for Black Students</p> $\frac{\text{Black freshmen enrolled}_{ijk} \text{ at institution} / \text{Total freshmen enrolled at institution}_{ijk}}{\text{Black high school graduates}_{ijk} \text{ in state} / \text{Total hs graduates}_{ijk} \text{ in state}} \quad (4)$
--

<p>Enrollment Equity Index for Latino Students</p> $\frac{\text{Latino freshmen enrolled}_{ijk} \text{ at institution} / \text{Total freshmen enrolled at institution}_{ijk}}{\text{Latino high school graduates}_{ijk} \text{ in state} / \text{Total hs graduates}_{ijk} \text{ in state}} \quad (5)$
---

where  $i$  represents the institution or group of institutions (public four-year universities or flagship university),  $j$  represents one of the 50 states and  $k$  represents the year that serves as the focus of the analysis (either 1994 or 2004).

The numerators in equations (4) and (5) represent the number of Blacks and Latinos, respectively, enrolled as first-time, full-time freshmen at a particular type of institution, in a particular state, in 1994 or 2004, divided by the total number of students of all races and ethnicities enrolled as first-time, full-time freshmen at a particular type of institution, in a particular state, in 1994 or 2004. The denominators in equations (4) and (5) represent the number of Black and Latino public high school graduates, respectively,

in a particular state, in 1994 or 2004, divided by the total number of public high school graduates of all races and ethnicities in each respective state, in 1994 or 2004.

Equity in undergraduate enrollments for low-income students is defined in equation (6) as:

<p>Enrollment Equity Index for Low-Income Students</p> $\frac{\text{Pell Grant recipients enrolled}_{ijk} \text{ at institution/All students enrolled at institution}_{ijk}}{\text{Low-income 18-24 yr. old hs grads. in state}_{ijk}/\text{All 18-24 yr. old hs grads. in state}_{ijk}} \quad (6)$
---

where  $i$  represents the institution or group of institutions (public four-year universities or flagship university),  $j$  represents one of the 50 states and  $k$  represents the year that serves as the focus of the analysis (either 1994 or 2004).

The numerator in equation (6) represents the total number of students receiving Pell Grants divided by the total number of undergraduates enrolled at a particular institutional type (public four-year universities or flagship university) in a particular state, 1994 or 2004. The denominator in equation (6) represents the total number of 18-24 year old high school graduates from low-income families in a given state divided by the total number of all 18-24 year old high school graduates in that same state, in 1994 or 2004.

The low-income equity index categorizes undergraduate Pell Grant recipients as low-income students. Prior research supports using the receipt of a Pell Grant as a proxy for low-income status (Mortenson, 2005; Gerald & Haycock, 2006). Since being established in 1972 as the Basic Educational Opportunity Grant (BEOG) the Pell Grant has made it possible for millions of low-income students to attend two-year and four-year public and private colleges and universities. In the 2005-2006 academic year over 5 million undergraduates received \$12.7 billion in Pell funds (College Board, 2006).

There are two key differences between the race/ethnicity and low-income enrollment equity indices. First, while the numerators of the race/ethnicity indices compare Black and Latino first-time, full-time freshmen, to all first-time, full-time freshmen, the numerator for the low-income index compares undergraduate Pell Grant recipients to all undergraduates. The indices use different comparison populations because Pell Grant recipients by class standing (i.e., freshmen, sophomore, junior, senior) were not publicly available, thus, all undergraduate Pell Grant recipients served as the best alternative reference group.

The second difference between the race/ethnicity and low-income indices is in the denominators. While the race/ethnicity metrics compare Black and Latino public high school graduates in a state to all public high school graduates in a state, the low-income metric compares 18-24 year old low-income high school graduates in a state to all 18-24 year old high school graduates in a state. Because college students' income levels are not readily available to the public, I compare the proportion of Pell Grant recipients enrolled at a particular institution or group of institutions in each state to the proportion of low-income, traditional college-age (i.e., 18-24 years old) high school graduates in each state. I argue that, if the proportion of Pell Grant recipients enrolled at an institution in a given state is equal to the proportion of low-income young adults in that same state's population, equity in undergraduate enrollments for low-income students is achieved. The data limitations involved in calculating the enrollment equity indices are discussed later in the chapter.

### *Summary of Variables*

In all, there are two main categories of independent variables, those shaped by human capital and those shaped by institutional isomorphism. Nested within those two main categories are six sub-categories of variables (price of attendance, financial resources, labor market forces, selectivity level, expenditures and flagship status) and 14 individual variables. The enrollment equity indices for Black, Latino and low-income students serve as the study's dependent variables. Table 3.1 shows the descriptive statistics for each variable in the conceptual model.

### Data

This study uses data from the following eight publicly available information sources: the Integrated Postsecondary Education Data System, the Western Interstate Commission for Higher Education, the Integrated Public Use Microdata Series, *Measuring Up 2006*, the National Association of State Student Grant and Aid Programs, *Postsecondary Opportunity*, *U.S. News and World Report*, and the Bureau of Labor Statistics.

Table 3.1. Descriptive Statistics for Variables included in Conceptual Model.

Variable Name	Mean	Std. Deviation	N
In-state tuition	\$3781	2182	579
Required fees	\$1153	1288	579
Board charges	\$2555	575	579
Room charges	\$3295	1006	579
Ability to pay	.29	.05	579
Non need-based state aid	.28	.33	579
Unemployment rates	5.4%	.008	579
25 percentile SAT scores	929	98	579
Acceptance ratio	.72	.17	579
Institutional spending	.10	.04	579
Instructional spending	.33	.08	579
Research spending	.06	.08	579
Flagship	.09	.28	579
Highly selective flagship	.01	.11	579
Equity index for Black students	.93	.36	579
Equity index for Latino students	.90	.39	579
Equity index for low-income students	.75	.23	579

Source: Analyses of 2004 data from the Bureau of Labor Statistics, IPEDS Fall Enrollment and

### *Integrated Postsecondary Education Data System*

The primary dataset used in this study is derived from the annual Enrollment and Finance Surveys of the Integrated Postsecondary Education Data System (IPEDS), which is sponsored by the National Center of Education Statistics of the U.S. Department of Education. IPEDS is the primary data collection entity for colleges and universities in the United States and includes information on organizations whose primary mission is to provide postsecondary education. IPEDS consists of a series of six survey components that are designed to collect data from institutions in the following categories: student enrollments, program completions, graduation rates, faculty and staff employment, institutional finances and student financial aid. As a result of the 1992 amendment to the Higher Education Act of 1965, all colleges and universities that participate in any federal student financial assistance program, under the auspices of Title IV, are required to complete the IPEDS surveys (IPEDS, 2006).

IPEDS only includes data for private and public postsecondary institutions that are open to the general public, and excludes educational facilities and training sites that operate out of prisons, military bases or private corporations. Entities that exclusively offer non-credit bearing programs, such as test preparation centers, are also excluded from the database. IPEDS categorizes postsecondary institutions according to the highest level of degree they award or the length of their longest certificate or degree program, resulting in the following three institutional categories: baccalaureate or higher degree-granting institutions, two-year degree/certificate granting institutions, and less than two-year institutions. This study uses data obtained from the IPEDS enrollment surveys for the 1994-1995 and 2004-2005 academic years, and from the finance survey for the 2004-

2005 academic year, for public four-year universities, which are categorized as baccalaureate or higher degree-granting institutions. IPEDS data are the source of the following independent variables used in this study: 25<sup>th</sup> percentile SAT scores, acceptance ratio, in-state tuition, required fees, room charges, board charges, and institutional, instructional and research expenditures.

IPEDS is an appropriate dataset to use for this research study for a number of reasons. First, it includes enrollment data, disaggregated by race and ethnicity, for every two-year and four-year postsecondary institution in the country that participates in the Title IV program. IPEDS' inclusion of nearly all higher education institutions is a notable characteristic which enables me to use individual colleges and universities as the units of analysis and also allows me to distinguish my research from many other college access studies which have typically used students as the unit of analysis. Using institutions as the focus of the study provides me with the opportunity to examine the role that colleges and universities themselves play in facilitating higher or lower equity indices for certain groups of students, and enables me to make comparisons and inferences about differences between the equity indices for these student populations at different types of institutions (e.g., non-flagships, flagships, highly selective flagships) within and across states and at different points in time. Second, the IPEDS database allows me to examine the role that key institutional-level variables play in yielding higher or lower equity indices for underrepresented student groups and to analyze whether such institutional factors provide cues as to whether institutions have, or are likely to engage in isomorphic activities as a means of enhancing their prestige.



*Imputation of IPEDS Variables.*

The National Center for Education Statistics (NCES) reviews IPEDS data on an annual basis to address missing and/or inconsistent data issues. NCES used carry forward and nearest neighbor imputation procedures were used to replace missing values for data collected for the enrollment and finance surveys for the 2004-2005 academic year (NCES, 2006). The carry forward method uses enrollment and finance data from previous years to calculate values for institutions that are missing data, and the nearest neighbor method uses data from an institution most similar to the institution that is missing data to impute its enrollment and finance values. Despite these measures, several colleges and universities in the study's dataset were missing data for the following seven variables which were needed to compute the multivariate regression analyses using the 2004-2005 data: 25<sup>th</sup> percentile SAT scores, acceptance ratio, board charges, room charges, proportion of expenditures allocated to institutional support, proportion of expenditures allocated to instruction and proportion of expenditures allocated to research. In all, 161 of the 579 institutions in the 2004-2005 dataset, or 28% of the population, were missing data for one of these six variables. To minimize the effect of missing data on the study's analyses, I imputed data for institutions that were missing values for one or more of the variables in the conceptual model. For public four-year universities, except flagship campuses, that were missing data, I replaced the missing values with the average value of all other non-flagship, public four-year universities in the state, except the flagship, for the particular variable. For flagship universities that were missing data, I replaced the missing values with the average value of all other public flagship universities in the country, for a particular variable. Table 3.3 shows the number and

percentage of imputed cases, as well as descriptive statistics for each category of imputed variables.

*Western Interstate Commission for Higher Education*

The second data source used for this study is *Knocking at the College Door*, a publication produced by the Western Interstate Commission for Higher Education (WICHE). WICHE is a regional organization designed to coordinate information sharing among the various higher education systems of the western states (WICHE, 2006). Periodically, WICHE publishes *Knocking at the College Door* which includes data for actual and projected high school graduates, disaggregated by race and ethnicity, for each of the 50 states. I used the most recent edition of WICHE high school data which was published in 2003, and includes actual and projected numbers of high school graduates by state from 1988 to 2018. Data for the actual number of public high school graduates in each state are used to calculate the 1994 enrollment equity indices for Black and Latino students, and public high school graduate projections are used to calculate the 2004 enrollment equity indices for these groups. Prior research (e.g., Perna et al., 2006) that has examined the status of equity in higher education has used WICHE's high school graduates and projections to calculate equity indices.

Table 3.3. Descriptive Statistics for Cases with and without Imputed Variables

Variable Name	N	Percent	Mean	Std. Deviation
<b>25<sup>th</sup> Percentile SAT Scores</b>				
Cases imputed	89	15%	923	49.07
Cases with no imputation	490	85%	930	104.70
Total	579	100%		
<b>Acceptance Ratio</b>				
Cases imputed	78	13%	.78	.10
Cases with no imputation	501	87%	.71	.17
Total	579	100%		
<b>Board Charges</b>				
Cases imputed	161	29%	2644	486
Cases with no imputation	418	71%	2521	603
Total	579	100%		
<b>Room Charges</b>				
Cases imputed	141	24%	3307	777
Cases with no imputation	438	76%	3291	1070
Total	579	100%		
<b>Institutional Spending</b>				
Cases imputed	42	7%	.13	.03
Cases with no imputation	537	93%	.10	.04
Total	579	100%		
<b>Instructional Spending</b>				
Cases imputed	42	7%	.35	.10
Cases with no imputation	537	93%	.33	.08
Total	579	100%		
<b>Research Spending</b>				
Cases imputed	42	7%	.03	.06
Cases with no imputation	537	93%	.06	.08
Total	579	100%		

Source: Analyses of IPEDS Enrollment and Finance Data, 2004

### *Integrated Public Use Microdata Series (IPUMS)*

The Integrated Public Use Microdata Series (IPUMS) database is sponsored by the U.S. Census Bureau and consists of 39 high precision samples that have been derived from every census conducted between 1850 and 2000, and from American Community Surveys administered between 2000 and 2005. IPUMS is considered to be the source of the most comprehensive data on long-term trends in the American populace (IPUMS, 2007). I used IPUMS data to calculate the equity indices for low-income students. Since there is not a reliable national source of high school graduates by income level, the IPUMS database allowed me to calculate state-by-state estimates of the number of 18-24 year old high school graduates from families with annual incomes of less than \$30,000 or \$40,000, respectively, for the 1994 and 2004 indices. Because the IPUMS sample sizes for some states are very small, I calculated the three-year average for 1993, 1994, and 1995 and used this data point as the reference group for the 1994 low-income equity indices. Similarly, the three year average for 2003, 2004, and 2005 was used as the reference group for the 2004 equity indices. The IPUMS data were used to calculate low-income equity indices by comparing the proportion of undergraduate Pell Grant recipients (i.e., the target group) to the proportion of low-income young adults in a state's population (i.e., the reference group).

### *Measuring Up: The National Report Card on Higher Education*

*Measuring Up* is a bi-annual publication produced by the National Center for Public Policy and Higher Education (NCPPE). The report assigns letter grades to the 50 states based on their performance on the following six higher education indicators:

preparation, participation, affordability, completion, benefits and learning. Data for one of this study's human capital variables, family ability to pay, were obtained from the 2006 edition of *Measuring Up*. NCPPHE uses student enrollment and Pell Grant data for the 2004-2005 academic year, and family income data from 2003, 2004, and 2004 to calculate the family ability to pay variable (NCPPE, 2006). *Measuring Up* includes the family ability to pay variable in its affordability category, and calculates it as a composite of students' income levels, the availability of state financial aid and the attendance costs of colleges and universities in a given state. The ability to pay indicator examines variations in the proportion of income that families from different socioeconomic levels are responsible for paying to cover college expenses, and variations in tuition prices across different institutional sectors (i.e., public and private, two-year and four-year) within a particular state.

*National Association of State Student Grant and Aid Programs (NASSGAP)*

The National Association of State Student Grant and Aid Programs is a membership organization comprised of state agencies responsible for the administration of state supported student financial aid programs (NASSGAP, 2007). Each year NASSGAP publishes the *Annual Survey Report on State Sponsored Student Financial Aid* which tracks the current status of financial aid in each of the 50 states, as well as 10-year financial aid trends in each state. I used data in the 2004-2005 NASSGAP report to calculate the non need-based aid variable which is nested in the human capital category. This variable measures the proportion of each state's financial aid budget that is allocated to non-need based financial aid (NASSGAP, 2005).

### *Postsecondary Opportunity*

Pell recipient data for each of the institutions included in this study's dataset are obtained from *Postsecondary Opportunity*, a monthly newsletter and publicly available website authored by Thomas Mortenson, an education policy analyst. According to its website, *Postsecondary Opportunity* is designed to "inform those who formulate, fund, and administer public policy and programs about the condition of and influences that affect postsecondary education opportunity for all Americans" (*Postsecondary Opportunity*, 2006). This publication also gives special attention to the degree to which low-income students and students of color are academically prepared for, have access to, and graduate from the nation's postsecondary institutions.

*Postsecondary Opportunity* includes Pell data for each postsecondary institution in each of the 50 states, the District of Columbia and each U.S. Territory. The Pell data reported by *Postsecondary Opportunity* are obtained directly from the Office of Postsecondary Education of the United States Department of Education. Because the Department of Education does not include a Pell indicator in the IPEDS database, or make Pell data readily available by state and institution, *Postsecondary Opportunity* is the most reliable source from which to obtain these data. Because *Postsecondary Opportunity* does not provide Pell Grant data for the 1994-1995 academic year, I use Pell Grant data for the 1993-1994 academic year to calculate the 1994 low-income enrollment equity indices. I use Pell Grant data for the 2004-2005 academic year to calculate the 2004 low-income enrollment equity indices.

### *U.S. News and World Report*

The final data source used in this study is *U.S. News and World Report*, a weekly news magazine that features national and international stories covering education, health, politics, and money and business (*U.S. News and World Report*, 2007). The magazine was used to determine which flagship universities in the dataset were designated as highly selective flagships. Each fall, *U.S. News* publishes its *America's Best College's (ABCs)* edition, which uses a three-step process to rank approximately 1,400 public and private four-year institutions according to how they fare on a number of data indicators. The first step sorts schools into 1 of 10 categories according to their Carnegie classifications. Specialty schools, and those that primarily enroll non-traditional students or fewer than 200 students, are not ranked. The 10 categories of institutions are then further collapsed into the following four categories: National Universities, Liberal Arts Colleges, Universities-Master's, and Comprehensive Colleges- Bachelor's. Colleges in the Universities-Master's and Comprehensive Colleges- Bachelor's categories are also disaggregated by geographic region (i.e., North, South, Midwest, and West). The second step of the ranking process involves collecting and analyzing up to 15 variables (e.g., peer assessment, retention, faculty resources, student selectivity) for each school in the dataset. The final step of the process ranks colleges by category according to their total weighted score (*U.S. News and World Report*, 2007).

*U.S. News and World Report's* edition of *America's Best Colleges* is considered the most authoritative and widely consulted college rankings publication (Dichev, 2001). Although rankings systems that attempt to measure the educational quality of colleges and universities are relatively new, college guidebooks and rankings manuals have

become popular sources of information for prospective college students and their families (Hossler, 2000). Research suggests that *ABCs* sells more than 2.2 million copies and has a readership of 11 million people, which includes an estimated 400,000 prospective college applicants and their parents (Dichev, 2001; McDonough, Antonio, Walpole & Perez, 1998).

In addition to serving as a tool used by high school seniors and their families during the college search process, postsecondary institutions themselves utilize *U.S. News and World Report's* rankings. Many colleges and universities boast when they climb a place or two in *ABCs*, and use the annual college edition to identify their aspirational peers, establish their goals, and benchmark their progress (Hunter, 1995). Many institutions also include favorable information from the annual rankings on their websites, or as part of their promotional and recruitment materials (Hossler, 2000; Hunter, 1995; Pike, 2003). Thus, while *U.S. News and World Report's* editor suggests that the magazine never intended to become the arbiter of quality in higher education, it has, at least in a de facto manner, assumed that role (Education Sector, 2006). Further, while the *U.S. News* rankings tend to remain relatively stable over time, with 20 of the same schools comprising the list of Top 25 National Universities during the ten-year period from 1988 to 1998, such consistency has not prevented other institutions from vying to gain entry into the top spots (Dichev, 2001).

I used the *America's Best Colleges* edition of *U.S. News and World Report* to identify highly selective public flagship universities based upon prior research which suggests that the types of long-term benefits that college graduates receive are often related to the types of institutions they attend, and that students that attend more elite



universities are more likely to attain the most sought-after rewards (Brewer, 1999; Zhang, 2005). Given that the 50 flagship universities that are compared to the public four-year universities in each state are not a monolithic group and vary widely in their selectivity levels, pool of available resources, and in the range of benefits that they convey to their students, this study also distinguishes between the equity indices of non-flagships and flagships, and between highly selective flagships and all other institutions in the dataset (Gerald & Haycock, 2006; Mortenson 2004a; Mortenson, 2004b). I used the 2003 edition of *America's Best Colleges* to identify and distinguish highly selective flagship universities from other flagship campuses. I define highly selective flagships as those included in *ABCs* lists of Top 50 National Universities. I use the 2003 edition of *ABCs* to identify highly selective flagships because it represents the version of the magazine that was most likely to be used by freshmen that enrolled in college in the fall of 2004, the year that serves as the focus of this study's multiple regression analyses.

#### *Bureau of Labor Statistics*

Data for the statewide unemployment rate variable are obtained from the Local Area Unemployment Statistics (LAUS) program which is sponsored by the Bureau of Labor Statistics of the Department of Labor. Each month, the Bureau of Labor Statistics provides employment and unemployment estimates for approximately 7,200 locales including census regions, states, counties and cities. The unemployment rate represents the proportion of a particular segment of the labor force (e.g., regional, national) that was comprised of individuals who were not gainfully employed over a specific period of time (e.g., monthly, annually). A person who is at least 16 years old and was available and

physically able to work, and made efforts to find work, but did not work during the referenced period of time, is considered to have been unemployed (Bureau of Labor Statistics, 2007). Statewide unemployment rates for 2004 are included in the regression models.

### Limitations and Delimitations

This study has at least five limitations. The first limitation pertains to differences in the race/ethnicity and low-income equity indices which are calculated using college student populations that are not analogous. The equity equations for Black and Latino students use the number of first-time, full-time freshmen attending an institution or group of institutions in their numerators, and the access equity index for low-income students uses the total number of undergraduates enrolled at an institution or group of institutions in its numerator. Because the low-income equity index includes all undergraduate Pell recipients and not just first-time freshmen who receive Pell Grants, it is not a pure access measure in that it does not assess the extent to which low-income students are represented in a college or university at the first possible point of entry. However, I made the decision to include all undergraduate students in the low-income equity index because data on the number or percentage of first-time Pell Grants recipients are not publicly available whereas data on the number and percentage of all undergraduate Pell Grant recipients are available. I argue that using all undergraduate Pell Grant recipients to calculate low-income equity indices for public four-year institutions is an appropriate decision given that these indices still provide important insight into the degree to which these students are represented in the public four-year sector.

The second limitation involves using students' status as Pell Grant recipients as a proxy for their status as low-income students in the low-income student equity indices. IPEDS does not collect or report student-level data by income level. Nevertheless, previous studies have shown that students who receive Pell Grants are typically from low-income families, and in 2005 over 60% of Pell recipients were from families whose yearly incomes placed them in lowest quartile of annual incomes, nationally (U.S. Department of Education, 2006). Therefore, while not a perfect indicator of income, the Pell Grant is an appropriate proxy for determining if a student is from a low-income background. Furthermore, because the Department of Education does not collect or report high school graduates' family incomes, there was not a straightforward means of comparing the number of Pell Grant (low-income) recipients in a postsecondary institution, with the number of low-income high school graduates in a state. Therefore, in order to calculate the low-income student equity indices I compared the proportion of Pell Grant recipients at an institution or group of institutions to the proportion of low-income 18-24 year-old high school graduates in each state.

The third limitation of this study is that it does not include analyses for Native American students, who are also underrepresented in higher education. Nor does it include analyses for Asians, or for Black or Hispanic subgroups. The decision to exclude Native Americans from this study's analyses was made for two reasons. First, much of the college access literature which addresses the underrepresentation of minority students in postsecondary education focuses on African American and Latino students. Thus, while it might be appropriate to assume that many of the policies and practices that influence the degree to which Black and Latino students enroll in college also apply to

Native American students, I did not want to draw such a conclusion without having a solid theoretical basis for doing so. The second reason for excluding Native Americans from the study is that their small numbers may have resulted in unreliable analyses. For example, Native Americans comprised less than 1% of all high school diploma recipients in 1994 and 2004 (Common Core of Data, 2006). Asians were not included in this study's analyses because, when examined in the aggregate, Asian students are typically not underrepresented in higher education (Harvey & Anderson, 2005). However, some Asian subgroups, as well as some Black and Latino subgroups, are inequitably represented in colleges and universities, and are particularly underrepresented in institutions within the four-year sector. However, these populations were not included in the present analyses because enrollment data for subgroups are not publicly available from the Department of Education.

The fourth limitation is that the equity indices do not control for the effects of the migration of students across state lines. IPEDS data do not capture whether or not students enrolled at public universities are residents of the states in which particular institutions are located. Therefore, the enrollment equity indices do not reflect whether an institution or group of institutions achieves equity for a particular group by enrolling a proportional number of its states high school graduates from that group, or by recruiting and enrolling a substantial number of students from that particular group from other states.

The study's final limitation is a result of the reference populations used to calculate the equity indices. While the proportion of Black and Latino high school graduates is the most appropriate reference group to use when calculating the enrollment

equity indices for these students, doing so has its shortcomings. Because the representation of Blacks and Latinos among high school graduates in some states is relatively small, an institution or group of institutions might achieve or exceed equity by enrolling a small number of students from these groups. This suggests that institutions in states with low proportions of Black or Latino high school graduates may have high enrollment equity indices for these students, even though Blacks and Latinos account for small percentage of their first-time, full-time freshmen populations. Perna, Gerald, Baum and Milem (2007) cited a similar limitation in their use of equity indices to examine the status of race equity in employment for Black faculty and administrators in public higher education in the south.

Despite these limitations, this study still makes a significant contribution to college access research, specifically, and to higher education policy conversations and research agendas, more broadly. Given Carnevale's assertion that there will be a shortage of nearly 3 million college-educated workers by 2012 it is imperative to understand the extent to which underrepresented minority and low-income students, who will comprise a significant proportion of our growing populace, are equitably represented in the public four-year sector of postsecondary institutions (Carnevale, 2006). The extent to which students from these backgrounds are able to earn baccalaureate degrees has long-standing implications for their personal lives, as well as for the future of our nation. Furthermore, the degree to which Black, Latino and low-income students have the opportunity to receive their bachelor's degrees from our country's most esteemed public institutions will undoubtedly have a significant effect on whether or not the cadre of our future state and national leaders is reflective of our increasingly diverse society at-large.

## CHAPTER 4

### RESULTS

#### Introduction

Descriptive and multivariate regression analyses are used to examine equity in undergraduate enrollments for Black, Latino and low-income students. This chapter presents the findings for each of the four research questions, and includes separate analyses for all public four-year universities in the aggregate, excluding the flagship, and for the public flagship university in each respective state. Descriptive statistics are used to address the first and second research questions which examine the current status of equity and trends in the status of equity over a 10-year period, for each group of students. Multivariate analyses are used to address the third and fourth research questions which test the conceptual model's ability to predict enrollment equity indices for underrepresented students for institutions in the study's dataset. By using both descriptive and multivariate analyses, this study updates and extends previous examinations of equity at public postsecondary institutions conducted by Bensimon et al. (2006) and Perna et al. (2006).

#### Research Question One: Status of Equity at Public Four-Year Universities and Flagships

The first research question examines the 2004 equity indices for Black, Latino and low-income student enrollments. Table 4.1 shows the equity indices for first-time, full-time Black and Latino students at all public four-year universities, excluding the flagship, and for flagship universities in each state. For comparison purposes the table

Table 4.1. First-Time, Full-Time Enrollment Equity Indices for Black, Latino and White Students at Public 4-Year Universities and Public Flagship Universities: 2004<sup>a</sup>

State	Black			Latino			White		
	4-Year	Flagship	% HS Grads	4-Year	Flagship	% HS Grads	4-Year	Flagship	% HS Grads
Alabama	1.05	0.28	32	1.44	1.74	1	0.91	1.34	65
Alaska	0.76	0.82	4	1.11	1.00	3	0.93	0.90	67
Arizona	0.66	0.69	5	0.43	0.50	28	1.22	1.13	59
Arkansas	0.96	0.22	21	0.59	0.66	3	0.97	1.14	74
California	0.68	0.39	7	0.59	0.27	35	0.90	0.75	42
Colorado	0.72	0.31	4	0.68	0.44	15	1.00	1.03	76
Connecticut	0.71	0.49	11	0.68	0.46	10	0.98	0.98	76
Delaware	3.20	0.23	26	0.45	1.22	4	0.14	1.27	66
Florida	0.87	0.53	19	1.32	0.64	19	0.88	1.15	59
Georgia	0.77	0.15	33	0.81	0.50	3	1.08	1.40	60
Hawaii	1.22	0.60	2	0.49	0.60	4	1.94	1.61	19
Idaho	0.26	2.40	0	0.89	0.66	7	0.91	0.94	90
Illinois	1.00	0.41	14	0.70	0.58	11	0.96	0.97	70
Indiana	0.85	0.70	8	1.13	0.89	3	0.96	0.97	88
Iowa	1.32	0.95	2	0.81	0.86	2	0.94	0.96	93
Kansas	0.41	0.64	7	0.47	0.61	6	0.96	0.98	83
Kentucky	1.15	0.77	9	0.57	0.51	2	0.97	0.99	89
Louisiana	0.91	0.23	39	1.08	1.68	2	1.00	1.41	57
Maine	0.43	0.73	1	0.83	1.21	1	0.99	0.96	95

Source: Analyses of IPEDS 2004 enrollment data and WICHE high school graduates data. <sup>a</sup>4-year calculations do not include flagships.

Table 4.1 Continued. First-Time, Full-Time Enrollment Equity Indices for Black, Latino and White Students at Public 4-Year Universities and Public Flagship Universities: 2004<sup>a</sup>

State	Black			Latino			White		
	4-Year	Flagship	% HS Grads	4-Year	Flagship	% HS Grads	4-Year	Flagship	% HS Grads
Maryland	1.21	0.37	33	0.39	1.19	4	0.82	1.03	57
Massachusetts	0.74	0.46	8	0.58	0.51	7	0.98	0.96	80
Michigan	0.80	0.44	13	0.90	1.71	3	0.97	0.78	81
Minnesota	0.38	1.03	5	0.38	0.78	2	0.97	0.92	87
Mississippi	1.12	0.22	46	1.71	2.71	0	0.85	1.61	53
Missouri	0.81	0.50	13	1.15	0.98	2	0.97	1.02	84
Montana	1.97	1.52	3	0.99	1.22	2	0.99	0.94	90
Nebraska	0.68	0.59	4	0.68	0.62	5	0.97	0.98	89
Nevada	1.21	0.33	8	0.80	0.42	17	0.78	1.04	66
New Hampshire	0.99	1.37	1	0.77	1.10	2	0.96	0.87	95
New Jersey	0.78	0.59	15	1.07	0.71	13	1.54	0.80	65
New Mexico	1.65	1.48	2	0.97	0.82	46	1.03	1.11	39
New York	0.97	0.46	14	1.24	0.39	11	0.79	1.01	67
North Carolina	1.07	0.42	27	0.56	1.04	3	0.96	1.09	67
North Dakota	1.83	0.58	1	0.94	1.02	1	0.99	1.01	92
Ohio	1.07	0.63	11	1.20	2.01	1	0.96	0.94	87
Oklahoma	1.17	0.54	9	0.70	0.69	5	0.98	1.18	67
Oregon	0.88	0.83	2	0.60	0.43	8	0.93	0.94	84
Pennsylvania	0.92	0.40	11	0.75	1.18	3	0.95	1.01	84

Source: Source: Analyses of IPEDS enrollment data and WICHE high school graduates data. <sup>a</sup>4-year calculations do not include flagships



Table 4.1 Continued. First-Time, Full-Time Enrollment Equity Indices for Black, Latino and White Students at Public 4-Year Universities and Public Flagships: 2004<sup>a</sup>

State	Black			Latino			White		
	4-Year	Flagship	% HS Grads	4-Year	Flagship	% HS Grads	4-Year	Flagship	% HS Grads
Rhode Island	0.30	0.52	8	0.45	0.37	12	1.10	0.95	77
South Carolina	0.56	0.29	39	0.96	1.12	2	1.21	1.20	58
South Dakota	1.57	1.20	1	0.88	0.50	1	0.83	0.89	100
Tennessee	1.16	0.52	19	1.52	1.44	1	0.91	1.08	70
Texas	1.11	0.34	13	0.75	0.48	35	1.06	1.19	48
Utah	0.88	0.81	1	0.57	0.69	6	0.87	0.89	89
Vermont	1.60	2.17	0	1.78	3.92	1	0.94	0.94	97
Virginia	0.66	0.40	23	0.66	1.00	4	1.01	0.94	67
Washington	0.61	0.67	4	0.69	0.62	7	1.00	0.70	77
West Virginia	1.75	0.77	4	1.94	3.32	0	0.96	0.97	94
Wisconsin	0.66	1.18	5	0.66	1.02	3	1.03	0.97	87
Wyoming <sup>b</sup>	1.18	1.18	1	0.64	0.64	3	0.96	0.96	88

Source: Analyses of IPEDS enrollment data and WICHE high school graduates data. <sup>a</sup>4-year calculations do not include flagships.

<sup>b</sup>Wyoming's flagship university is the only public four-year university in the state.

also includes enrollment equity indices for first-time, full-time White students. The table shows that, with respect to equity for Black students, the public four-year universities in the aggregate, excluding the flagships, in 21 states met or exceeded equity in first-time, full-time enrollments and achieved equity indices of at least 1.0. Delaware had the highest equity index for Black freshmen (3.20) followed by North Dakota (1.83) and South Dakota (1.57). It is important to note, however, that when Delaware's flagship university is excluded from the equity calculations, the only remaining public four-year institution in the state is a historically Black university. Of states where Black students comprise at least 5% of high school graduates, Nevada (1.21) and Oklahoma (1.17) followed Delaware with the highest equity indices for Black freshmen. Five states were approaching equity in Black enrollments with indices between 0.90 and 0.99. Nineteen states had equity indices between 0.50 and 0.89, and five states (Idaho, Maine, Minnesota and Rhode Island) were at least 50 percentage points below equity in freshman enrollments for Black students. Blacks experienced the lowest levels of equity in Idaho where the enrollment equity index was nearly 75 percentage points (0.26) below equity.

In terms of equity for Black students at public flagship universities, 9 of the 50 flagships met or exceeded equity in first-time, full-time enrollments, and one flagship approached equity with an index of 0.95. Black students were most equitably represented among freshmen at the University of Vermont (2.17) where they accounted for more than twice as many students in the freshman class than among the state's high school graduates. The University of Kentucky (0.77) had the highest equity index for Black students among flagships in states where Blacks comprise at least 5% of high school graduates. Twenty additional flagships had equity indices for Black student enrollments

of between 0.50 and 0.89. The remaining 20 flagship campuses had equity indices for Black student enrollments that were at least 50 percentage points below full equity. Black students were most underrepresented at the University of Georgia (0.13) where they were more than 85 percentage points below equity. Similarly, Blacks were substantially underrepresented at the flagship universities in five other southern states (Alabama [0.28], Arkansas [0.22], Delaware [0.23], Mississippi [0.22] and South Carolina [0.29]) where they were at least 70 percentage points below equity relative to their representation among high school graduates in those respective states.

Table 4.1 also shows the 2004 equity indices for Latino students. Public four-year institutions in 13 states met or exceeded equity in freshmen enrollments for Latinos. West Virginia (1.94) had the highest Latino equity index, followed by Mississippi (1.71) and Tennessee (1.52). However, these states have small Latino populations, as Latino students represent no more than 4% of their high school graduates. Latinos also approached equity, as indicated by equity indices between 0.90 and 0.99, in five states (Michigan, Montana, New Mexico, North Dakota and South Carolina), and had enrollment equity indices of between 0.50 and 0.89 in 25 states. The equity indices for Latino enrollments were at least 50 percentage points below equity in seven states, and these students were most underrepresented among freshmen attending public four-year universities in Minnesota (0.38), Arizona (0.43), Delaware (0.45) and Rhode Island (0.45).

The equity indices for Latino students at public flagship campuses are also displayed in Table 4.1. Latinos were at or above equity at 20 flagships, and were more than twice as represented among freshmen than among high school graduates at flagships

in four states (Vermont [3.92], West Virginia [3.32], Mississippi [2.71] and Ohio [2.01]). Latinos were also approaching equity at the University of Missouri, where their enrollment index was 0.98. Additionally, the equity indices for Latino students ranged from 0.50 to 0.89 at 21 flagships. Latinos were at least 50 percentage points below equity at eight flagships, and while they accounted for 35% of high school graduates in California, they were furthest from achieving equity at this state's flagship, the University of California-Berkeley (0.27).

Table 4.1 also illustrates that the equity indices for Whites at public four-year universities were higher than the equity indices for Blacks or Latinos in a majority of states. Twenty-seven states had higher equity indices for Whites than for Blacks, and the equity disparities among these groups were largest in Rhode Island (80 percentage points) and New Jersey (76 percentage points). Similarly, Whites had higher equity indices than Latinos at public four-year universities in 35 states. Gaps in the equity indices between these two groups were largest in Hawaii (145 percentage points) and Arizona (79 percentage points). Furthermore, the table illustrates that, while the lowest equity index for Whites at a flagship campus was 0.70 at the University of Washington, Blacks and Latinos were more than 30 percentage points below equity at 34 and 24 flagship institutions, respectively.

The percentage distributions of the equity indices for Black, Latino and White students are shown in Table 4.2. This comparison suggests that while most public four-year universities, in the aggregate, and flagships were below equity in Black and Latino enrollments, this was not the case for White enrollments. White students were at or approaching equity at 84% (42) of all public four year universities, and 86% (43) of

Table 4.2. Percentage Distributions of First-time, full-time Enrollment equity Indices for Black, Latino and White Students: 2004<sup>a</sup>

Equity Index	Black				Latino				White			
	4-Year		Flagship		4-Year		Flagship		4-Year		Flagship	
Equity Index	#	%	#	%	#	%	#	%	#	%	#	%
1.0 or above	21	42%	9	18%	13	26%	20	40%	14	28%	22	44%
0.90-0.99	5	10%	1	2%	5	10%	1	2%	28	56%	21	42%
0.80-0.89	6	12%	2	4%	6	12%	3	6%	5	10%	4	8%
0.70-0.79	5	10%	4	8%	5	10%	2	4%	2	4%	3	6%
0.60-0.69	7	14%	5	10%	8	16%	10	20%	0	0%	0	0%
0.50-0.59	1	2%	9	18%	6	12%	6	12%	0	0%	0	0%
0.40-0.49	2	4%	8	16%	5	10%	5	10%	0	0%	0	0%
0.30-0.39	2	4%	5	10%	2	4%	2	4%	0	0%	0	0%
0.20-0.29	1	2%	6	12%	0	0%	1	2%	0	0%	0	0%
0.10-0.19	0	0%	1	2%	0	0%	0	0%	1	2%	0	0%
Total	50	100%	50	100%	50	100.0	50	100%	50	100%	50	100%

Source: Analyses of IPEDS enrollment data and WICHE high school graduates data. <sup>a</sup>4-year calculations exclude flagship universities.

flagships. Comparatively, the equity indices for Blacks and Latinos were at least 0.90 in smaller shares of all public four-year universities, 52% (26) and 36% (18), respectively, and flagship campuses, 20% (10) and 44% (22), respectively.

The final component of the first research question examines the status of equity in undergraduate enrollments for low-income students. Table 4.3 shows that six states (Delaware, Hawaii, Idaho, New York, Utah and Vermont) met or exceeded equity in low-income student enrollments at all public four-year universities. Low-income students achieved the highest equity index in Delaware (2.00) where they accounted for twice the proportion of college students than of high school graduates in the state. California (0.93) and Mississippi (0.91) approached equity in the proportion of low-income students

Table 4.3. Equity Indices for Low-income Undergraduates at Public 4-year and Public Flagship universities: 2004<sup>a</sup>

State	4-year	Flagship	% HS Grads
Alabama	0.70	0.46	52
Alaska	0.38	0.47	40
Arizona	0.57	0.51	50
Arkansas	0.85	0.43	57
California	0.93	0.87	40
Colorado	0.56	0.32	46
Connecticut	0.58	0.42	35
Delaware	2.00	0.38	26
Florida	0.78	0.51	47
Georgia	0.82	0.33	42
Hawaii	1.45	0.82	27
Idaho	1.31	0.52	43
Illinois	0.79	0.41	42
Indiana	0.66	0.42	42
Iowa	0.60	0.43	42
Kansas	0.70	0.35	46
Kentucky	0.63	0.47	55
Louisiana	0.73	0.31	64
Maine	0.87	0.72	43
Maryland	0.73	0.47	37
Massachusetts	0.63	0.68	35
Michigan	0.66	0.36	39
Minnesota	0.82	0.61	30
Mississippi	0.91	0.41	58
Missouri	0.56	0.32	53
Montana	0.61	0.60	66
Nebraska	0.65	0.45	49
Nevada	0.41	0.31	45

Source: Analyses of IPUMS American Community Survey data and Postsecondary Opportunity Pell data. <sup>a</sup>4-year calculations exclude flagship universities.

Table 4.3 continued. Equity indices for low-income undergraduates at public 4-year and flagship universities: 2004<sup>a</sup>

State	4-year	Flagship	% HS Grads
New Hampshire	0.70	0.46	25
New Jersey	0.72	0.89	32
New Mexico	0.66	0.55	66
New York	1.34	0.93	43
North Carolina	0.59	0.27	55
North Dakota	0.58	0.47	53
Ohio	0.69	0.54	49
Oklahoma	0.84	0.47	52
Oregon	0.70	0.54	49
Pennsylvania	0.72	0.60	42
Rhode Island	0.66	0.55	38
South Carolina	0.58	0.48	50
South Dakota	0.67	0.62	52
Tennessee	0.69	0.42	54
Texas	0.77	0.45	49
Utah	1.25	1.06	27
Vermont	1.06	0.49	35
Virginia	0.46	0.17	46
Washington	0.63	0.50	46
West Virginia	0.83	0.55	50
Wisconsin	0.64	0.37	37
Wyoming <sup>b</sup>	0.54	0.54	50

Source: Analyses of IPUMS American Community Survey data and Postsecondary Opportunity Pell data. <sup>a</sup>Public 4-year calculations exclude flagship universities.

<sup>b</sup>Wyoming's flagship university is the only public 4-year university in the state.

enrolled at public four-year colleges. The equity indices for low-income students were between 0.50 and 0.89 in 39 states, and more than 50 percentage points below equity in three states. Low-income students were furthest from achieving equity at public four-year institutions in Alaska (0.38), Nevada (0.41) and Virginia (0.46).

Table 4.3 also shows the low-income equity indices for flagship universities. The University of Utah (1.06) is the only flagship that achieved equity in undergraduate enrollments for low-income students. The State University of New York at Buffalo (0.93), New York's flagship campus, was less than 10 percentage points below equity in low-income enrollments. Nineteen additional flagships had low-income equity indices that ranged from 0.50 to 0.89. However, the majority of the nation's flagship universities, 29, were more than 50 percentage points below equity in low-income student enrollments. Low-income students were least represented, and more than 80 percentage points below equity, among undergraduates at the University of Virginia which had an equity index of 0.17. The University of North Carolina's equity index of 0.27 was also more than 70 percentage points below equity.

The percentage distributions for the equity indices for Black, Latino and low-income students at both public four-year institutions and the public flagship in each state are presented in Table 4.4. Blacks and Latinos achieved equity in 42% and 26%, respectively, of public four-year universities, and 18% and 40%, respectively, of flagship universities. However a smaller share of low-income students, than of Blacks or Latinos, reached equity in enrollments at either public four-year institutions (10%) or flagship campuses (2%). While low-income students were underrepresented at both public four-year and flagship universities, they were severely underrepresented at the flagships where



over half (56%) of the equity indices for low-income students were more than 50 percentage points below equity. Smaller proportions of the enrollment equity indices for Blacks (40%) and Latinos (14%) at flagship universities were in this category.

Table 4.4. Percentage Distributions of Enrollment Equity Indices for Black, Latino and Low-income Students: 2004<sup>a</sup>

Equity Index	Black				Latino				Low-income			
	4-Year		Flagship		4-Year		Flagship		4-Year		Flagship	
Equity Index	#	%	#	%	#	%	#	%	#	%	#	%
1.0 or above	21	42%	9	18%	13	26%	20	40%	5	10%	1	2%
.90-.99	5	10%	1	2%	5	10%	1	2%	2	4%	1	2%
.80-.89	6	12%	2	4%	6	12%	3	6%	8	16%	3	6%
.70-.79	5	10%	4	8%	5	10%	2	4%	10	20%	1	6%
.60-.69	7	14%	5	10%	8	16%	10	20%	14	28%	5	10%
.50-.59	1	2%	9	18%	6	12%	6	12%	8	16%	10	20%
.40-.49	2	4%	8	16%	5	10%	5	10%	2	4%	18	36%
.30-.39	2	4%	5	10%	2	4%	2	4%	1	2%	9	18%
.20-.29	1	2%	6	12%	0	0%	1	2%	0	0%	1	2%
.10-.19	0	0%	1	2%	0	0%	0	0%	0	0%	1	2%
Total	50	100%	50	100%	50	100%	50	100%	50	100%	50	100%

Source: Analyses of IPEDS, IPUM, Postsecondary Opportunity and WICHE data

<sup>a</sup>4-year calculations exclude flagship universities.

#### Research Question 2: Trends in Equity at Public Four-Year Universities and Flagships

The second research question examines trends in equity in undergraduate enrollments from 1994 to 2004. Table 4.5 displays trends in equity for Blacks at all public four-year universities and the flagship campus in each state. Between 1994 and 2004, equity in first-time, full-time enrollments for Blacks increased in 20 states, remained the same in one state, and decreased in 29 states. Gains in equity ranged from 1 to 131 percentage points, and were greatest in North Dakota and Vermont which

Table 4.5. Change in First-time, Full-time Enrollment Equity Indices for Black Students at Public 4-Year and Public Flagship Universities: 1994-2004<sup>a</sup>

State	4-Year				Flagship				
	1994	2004	Change 1994-2004		1994	2004	Change 1994-2004		
			Equity Index	% Enrollment			Equity Index	% Enrollment	% HS Grads
Alabama	0.91	1.05	0.14	14	0.37	0.28	-0.09	-25	0
Alaska	1.53	0.76	-0.77	-50	0.84	0.82	-0.02	0	18
Arizona	0.82	0.66	-0.16	0	0.70	0.69	-0.01	50	103
Arkansas	0.97	0.96	-0.01	14	0.33	0.22	-0.11	-29	5
California	0.87	0.68	-0.19	-29	0.85	0.39	-0.46	-50	28
Colorado	0.65	0.72	0.11	0	0.60	0.31	-0.29	-67	37
Connecticut	0.89	0.71	-0.20	-20	0.57	0.49	-0.08	-17	24
Delaware	3.70	3.20	-0.50	2	0.24	0.23	-0.02	20	50
Florida	1.03	0.87	-0.16	-19	0.37	0.53	0.16	25	18
Georgia	0.87	0.77	-0.10	-14	0.29	0.15	-0.14	-50	17
Hawaii	0.29	1.22	0.93	100	0.35	0.60	0.25	0	-15
Idaho	3.59	0.26	-3.33	0	2.83	2.40	-0.43	0	118
Illinois	0.74	1.00	0.26	-22	0.51	0.41	-0.10	-25	6
Indiana	0.69	0.85	0.16	17	0.66	0.70	0.04	20	1
Iowa	1.11	1.32	0.21	0	1.18	0.95	-0.23	-33	3
Kansas	0.72	0.41	-0.31	-25	0.49	0.64	0.15	3	33
Kentucky	1.36	1.15	-0.21	-9	0.80	0.77	-0.03	17	11

Source: Analyses of IPEDS enrollment data and WICHE high school graduates data. <sup>a</sup>4-year calculations exclude flagship universities.

Table 4.5 continued. Change in First-time, Full-time Enrollment Equity Indices for Black Students at Public 4-Year and Public Flagship Universities: 1994-2004<sup>a</sup>

State	4-Year				Flagship				
	1994	2004	Change 1994-2004		1994	2004	Change 1994-2004		%HS Grads
			Equity Index	% Enrollment			Equity Index	%Enrollment	
Louisiana	1.08	0.91	-0.17	-13	0.28	0.23	-0.05	-10	3
Maine	0.96	0.43	-0.53	100	1.94	0.73	-1.21	0	175
Maryland	1.25	1.21	-0.16	-5	0.50	0.37	-0.13	-20	50
Massachusetts	0.79	0.74	-0.05	0	0.56	0.46	-0.10	0	28
Michigan	0.76	0.80	0.04	0	0.74	0.44	-0.30	-33	24
Minnesota	0.72	0.38	-0.34	0	1.71	1.03	-0.68	25	175
Mississippi	1.12	1.12	0.00	-2	0.13	0.22	0.09	67	-2
Missouri	0.58	0.81	0.23	4	0.81	0.50	-0.31	-33	27
Montana	1.01	1.97	0.96	100	0.58	1.52	0.94	100	12
Nebraska	0.88	0.68	-0.20	0	0.61	0.59	-0.02	50	32
Nevada	1.00	1.21	0.21	8	0.35	0.33	-0.02	0	66
New Hampshire	0.88	0.99	0.11	0	0.92	1.37	0.45	0	54
New Jersey	0.97	0.78	-0.19	-14	0.68	0.59	-0.09	-40	26
New Mexico	1.18	1.65	0.47	33	1.10	1.48	0.38	100	28
New York	1.13	0.97	-0.14	-13	0.59	0.46	-0.13	-25	11
North Carolina	0.90	1.07	0.17	16	0.46	0.42	-0.04	-15	13
North Dakota	0.52	1.83	1.31	200	1.35	0.58	-0.77	0	50

Source: Analyses of IPEDS and WICHE Data. <sup>a</sup>4-year calculations exclude flagship universities.

Table 4.5 continued. Change in First-time, Full-time Enrollment Equity Indices for Black Students at Public 4-Year and Public Flagship Universities: 1994-2004

State	4-Year				Flagship				
	1994	2004	Change 1994-2004		1994	2004	Change 1994-2004		% HS Grads
			Equity Index	% Enrollment			Equity Index	% Enrollment	
Ohio	1.20	1.07	-0.13	22	1.09	0.63	-0.46	-13	46
Oklahoma	1.16	1.17	0.01	10	1.16	0.54	-0.62	-50	23
Oregon	0.99	0.88	-0.11	100	1.10	0.83	-0.27	0	59
Pennsylvania	1.16	0.92	-0.24	-9	0.32	0.40	0.08	33	37
Rhode Island	0.60	0.30	-0.30	-33	0.73	0.52	-0.21	0	59
South Carolina	0.47	0.56	0.09	22	0.53	0.29	-0.24	-45	8
South Dakota	0.90	1.57	0.67	100	0.86	1.20	0.34	100	71
Tennessee	1.14	1.16	0.02	10	0.27	0.52	0.25	50	9
Texas	1.34	1.11	-0.23	-6	0.44	0.34	-0.10	0	61
Utah	2.03	0.88	-1.15	0	2.40	0.81	-1.59	0	132
Vermont	0.31	1.60	-1.29	0	1.83	2.17	0.34	0	88
Virginia	0.88	0.66	-0.22	-21	0.52	0.40	-0.12	-18	39
Washington	0.80	0.61	-0.19	0	0.90	0.67	-0.23	0	76
West Virginia	1.65	1.75	0.10	0	1.14	0.77	-0.37	-25	-9
Wisconsin	0.24	0.66	0.42	2	0.44	0.54	0.10	50	49
Wyoming <sup>b</sup>	1.66	1.17	-0.49	0	1.66	1.18	-0.48	0	36

Source: Analyses of IPEDS enrollment data and WICHE high school graduates data. <sup>a</sup>4-year calculations exclude flagship universities. <sup>b</sup>Wyoming's flagship is the only public 4-year university in the state.

increased by 131 and 129 percentage points, respectively. Of states where Black students comprised at least 5% of high school graduates, Illinois and Alabama experienced the greatest gains 26 and 14 percentage points, respectively, in their equity indices.

Mississippi's enrollment equity index for Black students remained constant at 1.12 over the 10-year time period. However, this stability may be partly attributable to the fact that three of Mississippi's seven public four-year universities are historically Black institutions. Decreases in equity for first-time, full-time Black freshmen ranged from one to 333 percentage points, and were greatest in Idaho (333 percentage points) and Utah (115 percentage points).

With regard to trends in equity for Black students at public flagship universities, Table 4.5 also shows that equity for Blacks increased at 13 flagships and decreased at 37 flagships from 1994 to 2004. Increases in equity ranged from 4 to 94 percentage points and were greatest at the University of Montana, which experienced the 94 percentage point increase, and the University of New Hampshire which increased its equity index by 45 percentage points. The University of Kansas and the University of Mississippi experienced the greatest gains, 15 and 9 percentage points respectively, among states where Black students comprised at least 5% of high school graduates. Yet, despite increases in equity at some flagships, the equity indices for Black students were at or above 1.0 at flagships in only eight states (Idaho, Minnesota, Montana, New Hampshire, New Mexico, South Dakota, Vermont and Wyoming), and none of the flagships that achieved equity in Black enrollments were located in states with substantial populations of Black high school graduates. Decreases in equity for Black students at the flagships ranged from one percentage point at the flagships in Arizona and Delaware to 159

percentage points at the University of Utah. Eight states (Hawaii, Indiana, Montana, New Mexico, South Dakota and Tennessee), which with the exception of Tennessee have relatively small percentages of Black high school graduates, experienced increases in their enrollment equity indices at both their public four-year and flagship universities.

The second part of this research question examines trends in equity in first-time, full-time enrollments for Latino students. Table 4.6 displays trends in the equity indices for Latinos at public four-year and flagship institutions. Equity for Latino students at public four-year universities increased in 11 states and decreased in 39 states. Increases in equity for Latinos were more moderate than those for Blacks, and ranged from 1 to 42 percentage points. Wisconsin experienced the greatest gains in equity for Latino students (42 percentage points) followed by Montana and Illinois which increased their Latino student enrollment indices by 39 and 38 percentage points, respectively. Texas and Florida, which ranked third and fifth, respectively, in terms of states with the highest percentage of Latino high school graduates, also experienced increases in their equity indices of 6 and 33 percentage points, respectively. While more than 20% of all states experienced increases in equity for Latinos, over 75% of states netted losses in their equity indices for this group. Decreases in equity for Latino students ranged from two percentage points in Idaho and Ohio to more than 100 percentage points in Mississippi (174 percentage points) and Alabama (137 percentage points).

Table 4.6 also displays trends in equity for Latino student enrollments at public flagship universities from 1994 to 2004. It shows that equity for Latinos increased at 16 flagships and decreased at 34 flagships over the 10-year period examined. Increases in equity in first-time, full-time enrollments ranged from 5 percentage points at the

Table 4.6. Change in First-time, Full-time Enrollment Equity Indices for Latino Students at Public 4-Year and Public Flagship Universities: 1994-2004<sup>a</sup>

State	4-Year				Flagship				
	Change 1994-2004				Change 1994-2004				
	1994	2004	Equity Index	% Enrollment	1994	2004	Equity Index	% Enrollment	% HS Grads
Alabama	2.82	1.45	-1.37	0	2.47	1.74	-0.73	185	310
Alaska	1.32	1.11	-0.21	0	0.53	1.00	0.47	101	33
Arizona	0.47	0.43	-0.04	20	0.60	0.50	-0.10	9	103
Arkansas	0.95	0.59	-0.36	100	1.38	0.66	-0.72	139	436
California	0.73	0.59	-0.14	-5	0.53	0.27	-0.26	-41	54
Colorado	0.83	0.68	-0.18	-9	0.61	0.44	-0.17	-18	50
Connecticut	0.80	0.68	-0.15	0	0.62	0.46	-0.16	-2	67
Delaware	0.44	0.45	0.01	100	0.66	1.22	0.56	142	68
Florida	0.99	1.32	0.33	71	0.87	0.64	-0.23	-3	65
Georgia	1.37	0.81	-0.56	50	1.17	0.50	-0.67	29	263
Hawaii	0.38	0.49	0.11	100	0.08	0.60	0.52	515	-11
Idaho	0.91	0.89	-0.02	50	0.49	0.66	0.17	144	110
Illinois	0.32	0.70	0.38	14	0.77	0.58	-0.19	11	70
Indiana	1.17	1.13	-0.04	50	1.16	0.89	-0.27	11	46
Iowa	0.94	0.81	-0.13	100	1.68	0.86	-0.82	-7	95
Kansas	0.67	0.47	-0.20	0	0.56	0.61	0.05	64	77
Kentucky	1.35	0.57	-0.78	100	2.18	0.51	-1.67	1	339

Source: Analyses of IPEDS enrollment and WICHE projections for high school graduates. <sup>a</sup>4-year calculations do not include flagships.

Table 4.6. Change in First-time, Full-time Enrollment Equity Indices for Latino Students at Public 4-Year and Public Flagship Universities: 1994-2004<sup>a</sup>

State	4-Year				Flagship				
	1994	2004	Change 1994-2004		1994	2004	Change 1994-2004		
			Equity Index	% Enrollment			Equity Index	% Enrollment	% HS Grads
Louisiana	1.27	1.08	-0.19	0	2.30	1.68	-0.62	0	32
Maine	1.60	0.83	-0.77	0	1.04	1.21	1.04	100	92
Maryland	0.72	0.39	-0.46	100	1.67	1.19	-0.48	12	110
Massachusetts	0.67	0.58	-0.09	0	0.68	0.51	-0.17	-10	42
Michigan	1.07	0.90	-0.17	0	2.66	1.71	-0.95	-17	52
Minnesota	0.67	0.38	-0.34	0	1.38	0.78	-0.60	0	119
Mississippi	3.45	1.71	- 1.74	0	4.58	2.71	-1.87	57	163
Missouri	1.63	1.15	- 0.48	100	1.49	0.98	-0.51	34	134
Montana	0.60	0.99	0.39	100	0.95	1.22	0.27	42	22
Nebraska	0.82	0.68	-0.14	50	0.84	0.62	-0.22	44	117
Nevada	0.84	0.80	-0.04	75	0.47	0.42	-0.05	53	178
New Hampshire	0.82	0.77	-0.05	0	0.66	1.11	0.44	93	121
New Jersey	1.40	1.07	-0.33	0	0.95	0.71	-0.24	-2	60
New Mexico	0.91	0.97	0.06	16	0.71	0.82	0.11	28	31
New York	1.47	1.24	-0.16	0	0.42	0.39	-0.03	12	30
North Carolina	1.14	0.56	-0.58	100	0.97	1.04	0.07	345	387
North Dakota	0.85	0.94	0.09	100	0.98	1.02	0.04	75	77

Source: Analyses of IPEDS enrollment and WICHE projections for high school graduates. <sup>a</sup>4-year calculations do not include flagships.



Table 4.6. Change in First-time, Full-time Enrollment Equity Indices for Latino Students at Public 4-Year and Public Flagship Universities: 1994-2004

State	4-Year				Flagship				
	1994	2004	Change 1994-2004		1994	2004	Change 1994-2004		
			Equity Index	% Enrollment			Equity Index	% Enrollment	% HS Grads
Ohio	1.22	1.20	-0.02	100	1.66	2.01	0.35	50	37
Oklahoma	1.01	0.70	-0.30	0	1.30	0.69	-0.61	3	120
Oregon	1.25	0.60	-0.65	-20	0.94	0.43	-0.51	-7	135
Pennsylvania	1.02	0.75	-0.27	0	1.32	1.18	-0.14	56	104
Rhode Island	0.88	0.45	-0.43	0	0.75	0.37	-0.38	4	154
South Carolina	1.79	0.96	-0.83	100	1.62	1.12	-0.40	158	300
South Dakota	0.62	0.88	0.26	100	0.37	0.50	0.13	141	79
Tennessee	2.00	1.52	-0.48	100	2.57	1.44	-1.13	52	181
Texas	0.69	0.75	0.06	30	0.49	0.48	-0.01	17	69
Utah	0.72	0.57	-0.15	100	0.90	0.69	-0.21	75	145
Vermont	2.04	1.78	-0.26	0	3.11	3.92	0.81	83	75
Virginia	0.86	0.66	-0.20	50	0.70	1.00	0.30	163	131
Washington	0.79	0.69	-0.10	-38	0.73	0.62	-0.11	26	85
West Virginia	1.65	1.94	0.29	0	2.84	3.32	0.48	73	26
Wisconsin	0.24	0.66	0.42	100	1.04	1.02	-0.02	62	108
Wyoming <sup>b</sup>	1.30	0.64	-0.66	-43	1.30	0.64	-0.66	-47	4

Source: Analyses of IPEDS enrollment data and WICHE projections for high school graduates. <sup>a</sup>4-year calculations do not include flagships.

<sup>b</sup>Wyoming's flagship university is the only public 4-year university in the state.

University of Kansas to 81 percentage points at the University of Vermont. The University of New Mexico, which increased its enrollment equity indices for Latino students by 11 percentage points, is the only flagship located in a state where Latinos comprised at least 5% of high school graduates to record an increase in this index. Equity indices for Latino students increased at all public four-year institutions and the public flagship university in seven states (Delaware, Hawaii, Montana, New Mexico, North Dakota, South Dakota and West Virginia).

Equity indices for Latinos decreased at 34 flagship universities. Decreases in equity indices for Latino students at the flagships were more precipitous than increases in equity for Latinos at these institutions. With the exception of New Mexico, the flagship campuses in the five other states (Arizona, California, Colorado, Nevada and Texas) where Latino students account for at least 15% of the high school graduate population experienced decreases in their equity indices. These declines ranged from one percentage point at the flagships in Arizona and Texas to 26 percentage points at California's flagship university. The equity indices for Latino enrollments also decreased by more than 100 percentage points at the flagships in three southern states, Kentucky, Mississippi and Tennessee. Equity indices for Latino students decreased at all public four-year universities and the flagship campus in 29 states.

The last aspect of this research question examines trends in equity in undergraduate enrollments from 1994 to 2004 for low-income students. Table 4.7 shows that over the period studied, equity indices for low-income students increased at all public four-year institutions in 37 states, remained the same in one state, and decreased in 12 states. Increases in equity for low-income students ranged from one percentage point in

Table 4.7. Change in First-time, Full-time Enrollment Equity Indices for Low-Income Students at Public 4-Year Universities and Public Flagship Universities: 1994-2004<sup>a</sup>

State	4-Year				Flagship				
	1994	2004	Change 1994-2004		1994	2004	Change 1994-2004		
			Equity Index	% Enrollment			Equity Index	% Enrollment	% HS Grads
Alabama	0.52	0.70	0.18	30	0.41	0.46	0.06	9	-4
Alaska	0.25	0.38	0.12	23	0.38	0.47	0.09	12	-29
Arizona	0.65	0.57	-0.08	-4	0.51	0.51	0.00	4	6
Arkansas	0.61	0.85	0.24	26	0.41	0.43	0.02	-4	-8
California	0.64	0.93	0.28	28	0.66	0.87	0.21	17	-11
Colorado	0.47	0.56	0.09	0	0.34	0.32	-0.02	-17	-13
Connecticut	0.32	0.58	0.26	50	0.37	0.42	0.05	15	-3
Delaware	0.92	2.00	1.09	45	0.16	0.38	0.23	43	-38
Florida	0.51	0.78	0.28	30	0.40	0.51	0.12	14	-13
Georgia	0.53	0.82	0.29	19	0.29	0.33	0.04	-7	-21
Hawaii	1.06	1.45	0.39	100	0.57	0.82	0.25	100	35
Idaho	0.82	1.31	0.49	25	0.72	0.52	-0.20	19	-4
Illinois	0.69	0.79	0.09	3	0.42	0.41	-0.01	-11	-9
Indiana	0.51	0.66	0.15	13	0.38	0.42	0.04	0	-11
Iowa	0.71	0.60	-0.11	-15	0.42	0.43	0.01	0	-2
Kansas	0.62	0.70	0.08	0	0.36	0.35	-0.01	-16	-10

Source: Analyses of IPEDS enrollment data, Postsecondary Opportunity Pell data and WICHE projections for high school graduates.  
<sup>a</sup>4-year calculations do not include flagships.

Table 4.7. Change in First-time, Full-time Enrollment Equity Indices for Low-Income Students at Public 4-Year Universities and Public Flagship Universities: 1994-2004<sup>a</sup>

State	4-Year				Flagship				
	1994	2004	Change 1994-2004		1994	2004	Change 1994-2004		
			Equity Index	% Enrollment			Equity Index	% Enrollment	% HS Grads
Kentucky <sup>b</sup>	0.86	0.63	-0.23	-32	0.37	0.47	0.10	13	-13
Louisiana	0.76	0.73	-0.03	0	0.33	0.31	-0.02	0	8
Maine	0.48	0.87	0.39	21	0.54	0.72	0.18	0	-25
Maryland	0.72	0.73	0.01	25	0.63	0.47	-0.16	-6	28
Massachusetts	0.56	0.63	0.07	10	0.70	0.68	-0.02	4	6
Michigan	0.56	0.66	0.10	4	0.35	0.36	0.01	-7	-9
Minnesota	0.64	0.82	0.18	-4	0.40	0.61	0.21	0	-33
Mississippi	0.67	0.91	0.24	7	0.35	0.41	0.06	-4	-18
Missouri	0.58	0.56	-0.02	-7	0.43	0.32	-0.11	-23	4
Montana	0.82	0.61	-0.21	8	0.58	1.52	0.94	33	32
Nebraska	0.64	0.66	0.01	0	0.48	0.45	-0.03	-4	2
Nevada	0.27	0.41	0.14	64	0.34	0.31	-0.03	8	18
New Hampshire	0.53	0.87	0.34	0	0.59	0.65	0.06	-20	-24
New Jersey	0.65	0.72	0.07	32	0.78	0.89	0.11	27	14
New Mexico	0.66	0.66	0.00	11	0.56	0.55	-0.01	12	10
New York	1.36	1.34	-0.02	8	0.72	0.93	0.21	38	8
North Carolina	0.49	0.59	0.10	36	0.29	0.27	-0.02	7	17

Source: Analyses of IPEDS enrollment data, Postsecondary Opportunity Pell data and WICHE projections for high school graduates. <sup>a</sup>4-year calculations do not include flagships. <sup>b</sup>1992-1993 Pell enrollment data used for Kentucky due to unavailability of 1993-1994 Pell enrollment data.

Table 4.7. Change in First-time, Full-time Enrollment Equity Indices for Low-Income Students at Public 4-Year Universities and Public Flagship Universities: 1994-2004<sup>a</sup>

State	4-Year				Flagship				
	1994	2004	Change 1994-2004		1994	2004	Change 1994-2004		% HS Grads
			Equity Index	% Enrollment			Equity Index	% Enrollment	
North Dakota	0.70	0.58	-0.12	-19	0.53	0.47	-0.06	-17	-5
Ohio	0.75	0.69	-0.16	19	0.59	0.54	-0.05	13	29
Oklahoma	0.75	0.84	0.10	3	0.52	0.47	-0.05	-14	-4
Oregon	0.69	0.70	0.01	10	0.54	0.54	0.00	13	9
Pennsylvania	0.74	0.72	-0.02	7	0.65	0.60	-0.05	0	11
Rhode Island	0.62	0.66	0.04	10	0.52	0.55	0.03	5	0
South Carolina	0.52	0.58	0.06	12	0.49	0.48	-0.01	0	2
South Dakota	0.77	0.66	-0.11	-6	0.72	0.62	-0.01	-9	8
Tennessee	0.45	0.69	0.24	21	0.29	0.42	0.13	21	-19
Texas	0.49	0.77	0.28	38	0.36	0.45	0.09	10	-11
Utah	0.98	1.25	0.27	-6	0.68	1.06	0.38	7	-31
Vermont	1.14	1.06	-0.08	19	0.50	0.49	-0.01	21	25
Virginia	0.55	0.56	0.01	0	0.27	0.17	-0.10	-20	21
Washington	0.48	0.63	0.16	17	0.37	0.50	0.13	15	-13
West Virginia	0.51	0.83	0.32	23	0.40	0.55	0.15	8	-19
Wisconsin	0.53	0.64	0.11	-8	0.32	0.37	0.05	-13	-24
Wyoming <sup>b</sup>	0.47	0.54	0.07	-2	0.54	0.47	0.07	-7	-21

Source: Analyses of IPEDS enrollment data, Postsecondary Opportunity Pell data and WICHE high school graduates data.

<sup>a</sup> 4-year calculations do not include flagships. <sup>b</sup>Wyoming's flagship is the only public 4-year university in the state.

four states (Maryland, Nebraska, Oregon and Virginia) to over 100 percentage points in Delaware. Decreases in equity for low-income students were more moderate than the increases, and ranged from one to 23 percentage points. Yet, despite the fact that a majority of states experienced increases in their enrollment equity indices for low-income students, in 2004 only six states (Delaware, Hawaii, Idaho, North Carolina, Utah and Vermont) achieved equity in low-income undergraduate enrollments at all public four-year universities.

Fewer states experienced increases in equity for low-income students at their flagship universities than at their other public four-year universities. Table 4.7 also shows that 28 flagships netted gains in their equity indices for low-income students, compared to gains on this index for all public four-year universities in 37 states. Equity increases at flagships ranged from one percentage point at the Universities of Iowa and Michigan to 94 percentage points at the University of Montana. The equity indices for low-income students remained stable at two flagships, the Universities of Arizona and Nebraska, and decreased at 20 flagships. Decreases in the equity indices for low-income students at flagships did not exceed 20 percentage points. This suggests that decreases in equity for Black and Latino enrollments at flagship universities were more precipitous than such decreases for low-income students. While a majority of flagship universities experienced increases in their equity indices for low-income students, only one flagship, the University of Utah, achieved equity in low-income undergraduate enrollments in 2004. Twenty-four states experienced increases in their low-income student equity indices at both their public four-year and flagship institutions. Conversely, seven states

experienced decreases in their low-income student equity indices at both their public four-year and flagship universities.

Table 4.8 displays the percentage distributions for changes in the equity indices for all three groups – Black, Latino and low-income students – at all public four-year and public flagship universities. It shows that public four-year institutions experienced decreases in their enrollment equity indices for Black and Latino students in a majority of states. Over half (58%) of states experienced decreases in their enrollment indices for Blacks, and over three-quarters (78%) experienced decreases in their enrollment indices for Latinos. Conversely, the equity indices for low-income students increased at public four-year universities in nearly three-quarters (74%) of states. The same trend was evident with respect to changes in equity indices at public flagship universities. The enrollment indices for Black and Latino students decreased at a vast majority, 74% and 66%, respectively, of the flagships, and increased for low-income students at over half (56%) of all flagship universities.

Table 4.8. Percentage Distributions of Changes in Enrollment Equity Indices for Black, Latino and Low-income students: 1994-2004

Equity Index	Black				Latino				Low-income			
	4-Year <sup>a</sup>		Flagship		4-Year <sup>a</sup>		Flagship		4-Year <sup>a</sup>		Flagship	
	#	%	#	%	#	%	#	%	#	%	#	%
Decreased	29	58%	37	74%	39	78%	34	68%	12	24%	20	40%
Increased	20	40%	13	26%	11	22%	16	32%	37	74%	28	56%
No Change	1	2%	0	0%	0	0%	0	0%	1	.02	2	4%
Total	50	100%	50	100%	50	100%	50	100%	50	100%	50	100%

Source: Analyses of IPEDS enrollment data, IPUMS American Community Survey data, Postsecondary Opportunity Pell data and WICHE high school projections. <sup>a</sup>4-year calculations exclude the flagship universities.

### Research Question 3: Predictors of Equity Indices

The third research question uses multivariate analyses to examine the relationship between the set of variables included in the study's conceptual model, excluding flagship and highly-selective flagship status, and enrollment equity indices for Black, Latino and low-income students at all public four-year and flagship universities. Table 4.9 shows the results of the regression analyses when Black, Latino and low-income student equity indices are the dependent variables, and when each of the independent variables is controlled for. The analyses reveal that the variables included in the partial model, which excludes the flagship variables, explain 20% of the variance in Black student equity indices. The analyses also suggest a statistically significant relationship between institutions' Black student equity indices and the following variables in the conceptual model's human capital category: ability to pay, amount of in-state tuition, proportion of state aid allocated to non need-based aid, amount of required fees, amount of room charges and unemployment rates. Two variables in the institutional isomorphism category, 25<sup>th</sup> percentile SAT score and acceptance ratio, are statistically significant. The 25<sup>th</sup> percentile SAT score is negatively related to the equity indices while acceptance ratio is positively related to the equity indices. Ability to pay has the strongest effect on Black student equity indices, such that when the variable increases by one standard deviation, Black student equity indices increase by 0.32 percentage points. The next most influential variable on Black student equity indices is statewide unemployment rate, which is negatively related to the dependent variable such that an increase of one standard deviation in statewide unemployment rates results in a 0.24 percentage point decrease in Black student equity indices. The following variables included in the model



Table 4.9. Summary of Multivariate Regression Analysis for Variables Predicting Equity Indices for Black, Latino and Low-Income Students – Partial Model.

Variable	Black		Latino		Low-Income	
	b	Beta	b	Beta	b	Beta
25 <sup>th</sup> Percentile SAT Score	.00	-.20***	.00	.02	.00	-.13**
Ability to Pay	2.53	.32***	3.96	.46***	.40	.08
Acceptance Ratio	.19	.09*	-.06	-.03	-.33	-.25***
Board Charges	.00	.01	.00	.03	.00	.07
In-state Tuition	.00	-.19***	.00	-.10*	.00	-.23**
Non need-based Aid	.13	.12**	.51	.43***	-.15	-.21***
Required Fees	.00	-.11*	.00	-.28***	.00	-.19***
Room Charges	.00	-.22***	.00	-.09*	.00	.10*
Unemployment Rate	-10.58	-.24***	-3.25	-.07	1.32	.05
Institutional Expenses	.40	.05	.05	.01	.16	.03
Instructional Expenses	-.21	-.05	-.32	-.07	.13	.04
Research Expenses	.44	.10	.27	.06	-.04	-.01
R <sup>2</sup>		.20		.34		.21

Source: Analyses of IPEDS, IPUMS, Postsecondary Opportunity and WICHE data

*b* = unstandardized regression coefficient; Beta = standardized regression coefficient

\**p*<.05; \*\**p*<.01; \*\*\**p*<.001

are unrelated to Black student equity indices: board charges, percent of expenditures spent on institutional support, percent of expenditures spent on instruction and percent of expenditures spent on research.

Table 4.9 also shows that the conceptual model predicts 34% of the variance in the enrollment equity indices for Latino students. Five variables included in the conceptual model's human capital category have a statistically significant relationship with the enrollment equity indices for Latino students: ability to pay, in-state tuition, proportion of state financial aid budget allocated to non need-based aid, amount of required fees and room charges. None of the variables in the institutional isomorphism category were significantly related to the enrollment equity indices for Latinos. Ability to pay had the strongest relationship with Latino student equity indices, such that an increase of one standard deviation in this variable results in a 0.46 percentage point increase in enrollment equity indices for Latino students. While non need-based aid was related to Latino student equity indices, the direction of the relationship was not as expected. An increase of one standard deviation in the proportion of a state's budget allocated to non need-based aid resulted in a 0.43 percentage point increase in equity indices for Latino students.

To examine the last component of the third research question, Table 4.9 shows the results of the regression analyses for low-income students. The model explains 21% of the variance in equity indices for low-income students at all public four-year and flagship universities. Six variables (25<sup>th</sup> percentile SAT scores, acceptance ratio, in-state tuition, proportion of state budget allocated to non need-based aid, amount of required fees and room charges) have a statistically significant relationship to the low-income student

indices. Four of these variables are in the conceptual model's human capital category, and two are in the institutional isomorphism category. Of the variables included in the model, acceptance ratio makes the strongest contribution toward explaining the low-income equity indices, but does so in an unexpected direction. The analyses suggest that an increase of one standard deviation in an institution's acceptance ratio results in a 0.25 percentage point decrease in its equity index for low income students.

#### Research Question 4: Effect of Flagship Status on Equity Indices

The fourth and final research question examines the relationship between institutions' flagship status and their equity indices for Black, Latino and low-income student enrollments. The results of the regression analyses for the partial and full models, for each of these student groups, are included in the tables that follow. The full model includes all of the variables in the partial model as well as two dummy variables, flagship and highly selective flagship. Non-flagship institutions serve as the reference group for the flagship variable, and all colleges and universities that are not considered highly selective flagships serve as the reference group for the highly selective flagship variable.

Table 4.10 shows that when the two flagship variables are added, the percent of variance in Black student equity indices explained by the regression model increases from 20% to 24%. In addition to the eight variables that were statistically related to equity indices for Black students in the partial model, the results of the regression analysis for the full model reveal that two additional variables (percent of expenditures allocated to research and flagship status) have a statically significant relationship to the

Table 4.10. Summary of Multivariate Regression Analysis for Variables Predicting Equity Indices for Black Students – Partial and Full Models

Variable	Equation 1		Equation 2	
	b	Beta	b	Beta
25 <sup>th</sup> Percentile SAT Score	.00	-.20**	.00	-.16**
Ability to Pay	2.53	.32**	2.60	.33***
Acceptance Ratio	.19	.09*	.18	.08*
Board Charges	.00	.01	.00	.03
In-state Tuition	.00	-.19***	.00	-.19**
Non need-based Aid	.13	.12**	.13	.11**
Required Fees	.00	-.11*	.00	-.13*
Room Charges	.00	-.22***	.00	-.23***
Unemployment Rate	-10.58	-.24***	-11.38	-.26***
Institutional Expenses	.40	.05	-.19	.02
Instructional Expenses	-.21	-.05	-.33	-.07
Research Expenses	.44	.10	.80	.17**
Flagship			-.29	-.23***
Highly Selective Flagship			-.08	-.03
R <sup>2</sup>		.20		.24

Source: Analyses of IPEDS, IPUMS, Postsecondary Opportunity and WICHE data

*b* = unstandardized regression coefficient; Beta = standardized regression coefficient

\**p*<.05; \*\**p*<.01; \*\*\**p*<.001

enrollment equity indices for Black students. Board charges is the only variable in the human capital category that is not statistically significant. Research expenditures is the only institutional spending variables that is significantly associated with Black student equity indices. However, the direction of the research expenditures variable is counter-intuitive in that an increase of one standard deviation in research expenditures is associated with a .17 percentage point increase in enrollment equity indices for Black students. Flagship status is also statistically significant, whereas being a flagship university is associated with a .23 percentage point decrease in an institution's Black student equity index. The highly selective flagship variable is not significantly related to Black student equity indices after controlling for other variables in the model.

Table 4.11 includes the results of the partial and full models regressed on equity indices for Latino students. The model's ability to explain the variance in Latino student equity indices remains stable at  $R^2 = .34$  when the flagship and highly selective flagship variables are added. The same five variables (ability to pay, in-state tuition, proportion of state financial aid budget allocated to non need-based aid, amount of required fees and room charges) that have a statistically significant relationship to Latino equity indices when the partial model is run, continued to be statistically significant when the full model was run. None of the variables in the institutional isomorphism category are significantly related to Latino student equity indices in the context of the full model. Likewise, neither the flagship or highly selective flagship variables were significantly related to the enrollment equity indices for this group.

The final aspect of this research question examines the relationship between flagship status and the enrollment equity indices for low-income students. Table 4.12

Table 4.11. Summary of Multivariate Regression Analysis for Variables Predicting Equity Indices for Latino Students – Partial and Full Models

Variable	Equation 1		Equation 2	
	b	Beta	b	Beta
25 <sup>th</sup> Percentile SAT Score	.00	.02	.00	.01
Ability to Pay	3.96	.46***	3.94	.46***
Acceptance Ratio	-.06	-.03	-.07	-.03
Board Charges	.00	.03	.00	.03
In-state Tuition	.00	-.10	.00	-.11*
Non need-based Aid	.51	.43***	.51	.43***
Required Fees	.00	-.28***	.00	-.27***
Room Charges	.00	-.09*	.00	-.09*
Unemployment Rate	-3.25	-.07	-2.80	-.06
Institutional Expenses	.05	.01	.11	.01
Instructional Expenses	-.32	-.07	-.29	-.06
Research Expenses	.27	.06	.18	.04
Flagship			.10	.07
Highly Selective Flagship			-.17	-.05
R <sup>2</sup>		.34		.34

Source: Analyses of IPEDS, IPUMS, Postsecondary Opportunity and WICHE data

*b* = unstandardized regression coefficient; Beta = standardized regression coefficient

\**p*<.05; \*\**p*<.01; \*\*\**p*<.001

Table 4.12. Summary of Multivariate Regression Analysis for Variables Predicting Equity Indices for Low-Income Students – Partial and Full Models

Variable	Equation 1		Equation 2	
	b	Beta	b	Beta
25 <sup>th</sup> Percentile SAT Score	.00	-.13*	.00	-.08
Ability to Pay	.40	.08	.46	.09
Acceptance Ratio	-.32	-.25***	-.34	-.25***
Board Charges	.00	.07	.00	.09*
In-state Tuition	.00	-.23***	.00	-.23***
Non need-based Aid	-.15	-.21***	-.15	-.22***
Required Fees	.00	-.19***	.00	-.21***
Room Charges	.00	.10*	.00	.09
Unemployment Rate	1.32	.05	.88	.03
Institutional Expenses	.16	.03	.02	.00
Instructional Expenses	.13	.04	.05	.02
Research Expenses	-.04	-.01	.20	.07
Flagship			-.19	-.24***
Highly Selective Flagship			-.12	-.06
R <sup>2</sup>		.21		.25

Source: Analyses of IPEDS, IPUMS, Postsecondary Opportunity and WICHE data

*b* = unstandardized regression coefficient; Beta = standardized regression coefficient

\**p*<.05; \*\**p*<.01; \*\*\**p*<.001

shows the results of the full model regressed on low-income student equity indices. The percent of variance in low-income student equity indices explained by the model increases from 21% to 25% when the flagship and highly selective flagship variables are added. While 25<sup>th</sup> percentile SAT score is significantly related to low-income student equity indices in the partial model, this variable is not statistically significant in the context of the full model. However, another variable in the institutional isomorphism category, acceptance ratio, continues to exert the strongest influence on low-income student equity indices when the full model is run. Flagship status has a statistically significant negative effect and is associated with a 0.19 percentage point decrease in institutions' low-income student equity indices. There is not a statistically significant relationship between low-income student equity indices and the highly-selective flagship variable.

### Summary

In summary, the descriptive analyses reveal that, in general, Black, Latino and low income students are not equitably represented among undergraduates in the public four-year sector in many states, or at many public flagship campuses. Blacks and Latinos experience less equity in first-time, full-time freshmen enrollments than Whites at either public four-year universities in the aggregate or flagship campuses. Blacks experience the greatest inequities at the flagships, while Latinos experience greater inequities in freshmen enrollments at other public four-year institutions. In a majority of states, equity indices for Blacks and Latinos have decreased from 1994 to 2004 at public institutions in the four-year sector in the aggregate, as well as at flagship universities. This finding



suggests that in 2004 Black and Latino students accounted for smaller shares of undergraduates in the public four-year sector, relative to the representation among high school graduates in their respective states, than they did over a decade ago.

The enrollment equity indices for low-income students increased at a majority of flagship universities and other public four-year institutions from 1994 to 2004. However, low-income students continued to experience greater levels of inequity than Blacks and Latinos, at both public four-year universities and flagship campuses.

The multivariate regression analyses show that there is a statistically significant relationship between a different set of variables and the equity indices for each of the three student groups. For example, while there is a statistically significant relationship between non need-based and the equity indices for Black, Latino and low-income students, the unemployment rate variables only has a statistically significant influence on Black student equity indices. Additionally, the model's ability to predict the equity indices for Black and low-income students increases when the flagship variables are added, but these variables do not increase the model's ability to explain variance in the equity indices for Latino students. The highly selective flagship variable does not have a statistically significant effect on the equity indices for any of the three student groups.

## CHAPTER 5

### DISCUSSION, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

#### Introduction

This study extends prior research which has examined the status of equity in undergraduate enrollments (Bensimon et al., 2006; Perna et al., 2006). Using a model that combines aspects of human capital and institutional theories as its framework, this study uses descriptive statistics to examine the status of equity in undergraduate enrollments for Black, Latino and low-income students at all public four-year universities in the aggregate, excluding the flagship campus, and the public flagship university, in each state. It also explores trends in the status of equity in undergraduate enrollments for all three student groups at both institutional types. Finally, the study uses multivariate regression to analyze the relationship between variables in the conceptual model and institutions' equity indices for Black, Latino and low-income students.

More specifically, this study examines the following four research questions:

1. How does the status of equity in undergraduate enrollments for Black, Latino and low-income students at all public four-year universities compare to the status of equity in undergraduate enrollments for these students at public flagship universities?
2. How do trends in equity in undergraduate enrollments for Black, Latino and low-income students at all public four-year universities between 1994 and 2004, compare to trends in equity in undergraduate enrollments for these students at public flagship universities over the same period?

3. What measures of human capital and institutional isomorphism are associated with equity indices for Black, Latino and low-income students at public four-year universities in the aggregate and public flagship campuses?
4. Is an institution's flagship status related to its equity indices for Black, Latino and low-income students?

The first section of this chapter summarizes the findings of each of the four research questions. The next section presents conclusions that may be informed by the study's results. The final section of this chapter discusses the study's implications and offers suggestions for future research.

## Discussion

### *Research Question One: Status of Equity at Public Four-Year and Flagship Universities*

Consistent with prior research (e.g., Bensimon et al., 2006; Perna et al., 2006), this study's descriptive analyses reveal that the equity indices for Black and Latino students were below equity at a majority of public four-year and flagship universities in the country. However, the analyses also show that Blacks achieved equity at public four-year institutions in a higher number of states, while Latinos achieved equity at public flagship campuses in more states. The equity indices for Blacks were at least 1.0 at public four-year institutions in 21 states while the equity indices for this group were at least 1.0 at only 8 flagships. Conversely, equity indices for Latino enrollments were at least 1.0 at public four-year universities in 13 states and at public flagship campuses in

20 states. The study's findings are also consistent with previous research (e.g., Gerald & Haycock, 2006) that examined the status of equity for low-income students in public postsecondary education. The analyses suggest that low-income students are inequitably represented at a majority of public four-year and flagship universities, and that the equity indices for this group are lower, on average, than the equity indices for either Blacks or Latinos at either institutional type. Low-income students achieved full equity at public four-year institutions in only five states and at only one flagship university.

Second, the descriptive analyses highlight the importance of examining equity indices for public colleges and universities within their state contexts. For example, the equity indices for Black and Latino students at all public four-year and flagship universities were highest in states where students from each of these respective groups accounted for small proportions of high school graduates. On the other hand, the equity indices for these groups at both types of institutions were lower, on average, in states where Blacks and Latinos comprised a substantial share of the high school graduate population. This suggests that Black and Latino students achieved full equity in enrollments at all public four-year and flagship universities in some states because of their small numbers among the reference population.

Finally, the findings from this research question suggest that it may be prudent to further disaggregate institutional types beyond public four-year and flagship universities. Perna et al. (2006) examined equity for Black students in five institutional categories (i.e., all public institutions, public two-year institutions, public four-year historically Black colleges and universities [HBCUs], public four-year predominately White institutions [PWIs], and public flagship institutions) in 19 states. Their analyses found

that, in general, Black students met or exceeded equity in undergraduate enrollments in public two-year institutions and HBCUs and were below equity at PWIs and flagship campuses. Findings from this study suggest that disaggregating institutions into only two categories, all public four-year and flagship universities, may have masked the effect of HBCUs on Black student equity indices in states such as Delaware, Maryland, Mississippi and North Carolina. For example, when Maryland's four HBCUs are excluded from its enrollment equity index for public four-year institutions its equity index for Black student enrollments decreased from 1.21 to 0.30.

*Research Question Two: Trends in Equity at Public Four-Year and Flagship Universities*

Perna et al. (2006) found that from 1991 to 2001 the status of equity for Black undergraduates at PWIs increased in nine (47%) of the 19 southern and southern-border states, decreased in nine (47%) states and remained the same in one (5%) state. Their analyses also revealed that from 1991 to 2001 decreases in equity for Black students were no more than 12 percentage points in any state. Findings from this research study suggest that when examining trends in equity in all 50 states from 1994 to 2004, the equity indices for Black students decreased at all public four-year institutions in a larger proportion of states (58%) and by a larger margin (from 1 to 333 percentage points).

In terms of trends in equity for Latino and low-income students in the public four-year sector, this study's findings suggest that, similar to trends in equity for Black students, equity for Latino students decreased at a majority (78%) of these institutions. However, equity indices for low-income students increased at a majority (74%) of public

four-year institutions from 1994 to 2004. Decreases in Latino student equity indices may be attributed, at least in part, to increases in the percentage of Latino high school graduates that outpaced increases in Latino student enrollments at public four-year universities in many states. Conversely, while the proportion of low-income high school graduates declined in 21 states, these students accounted for a larger share of undergraduates at public four-year institutions in 41 states, which may explain why the equity indices for low-income students increased at a majority of institutions in the public four-year sector.

With regard to trends in equity indices at public flagship universities, Perna et al. (2006) found that equity indices for Black students decreased at flagships in 12 of 19 southern and border states from 1991 to 2001, and that the decreases ranged from 2 to 22 percentage points. Similarly, Gerald and Haycock (2006) found that enrollment equity indices for minority and low-income students decreased at flagships in 38 and 6 states, respectively, over a 10-year period. Consistent with these findings, the results of this study's descriptive analyses suggest that equity in undergraduate enrollments for Blacks and Latinos decreased at a majority of the flagship campuses, 39 and 35, respectively, from 1994 to 2004. Decreases in equity at public flagships across all 50 states were more marked than those found by Perna et al., and ranged from 1 to 156 percentage points for Blacks, and from 3 to 187 percentage points for Latinos. On the other hand, contrary to Gerald and Haycock's findings, this study's analyses revealed that from 1994 to 2004 the enrollment equity indices for low-income students increased at a majority (35) of the nation's public flagship campuses. One explanation for differences in the low-income equity trends observed by Gerald and Haycock and the present study may be due to

differences in the composition of the low-income reference groups used. Gerald and Haycock compared the proportion of Pell Grant recipients enrolled in each flagship university to the proportion of Pell Grant recipients enrolled at all other public colleges and universities in each respective state. The present study compares the proportion of Pell Grant recipients enrolled at each flagship university to the proportion of low-income high school graduates in each state.

Decreases in enrollment equity indices for Black and Latino students at public four-year and flagship universities in a majority of states, and increases in these indices for low-income students may be at least partly related to an increase in the number of states and institutions that have adopted race-neutral, income-based admissions policies (U.S. Department of Education, Office for Civil Rights, 2003). However, it is important to acknowledge that, although the equity indices for low-income students increased at most public four-year and flagship universities from 1994 to 2004, these increases resulted in low-income students achieving equity at the public four-year universities in only five states, and at the flagship campus in only one state.

*Research Question Three: Predictors of Equity Indices at Public 4-Year and Flagship Universities*

This study's conceptual model is based on two sets of theoretical frameworks: economic theories of human capital and institutional theories of institutional isomorphism. Many college access studies have used measures of human capital in their conceptual models (e.g., Dynarski, 2002; Hossler et al., 1989; Perna, 2000), and measures of selectivity and institutional spending have been used to examine whether institutions are engaged in isomorphic behaviors (e.g., Harter, Wade & Watkins, 2005; Mophew,

2002). The present study uses multivariate regression analyses to measure the relationship between a set of variables that measure human capital and institutional isomorphism and institutions' enrollment equity indices. The multivariate regression analyses show that measures of human capital and institutional isomorphism are significant predictors of enrollment equity indices for Black and low-income students, while human capital measures only are significantly related to equity indices for Latino students.

A statistically significant relationship existed between four variables (in-state tuition, proportion of financial aid budget allocated to need-based aid, required fees and room charges) in the conceptual model's human capital category and the equity indices for all three groups. Consistent with prior research (e.g., Behrman et al., 1992; Perna et al., 2005), the price of in-state tuition was negatively associated with the equity indices for Black, Latino and low-income students. Similarly, there was a statistically significant negative relationship between the amount of required fees and the enrollment equity indices for all three student groups.

The proportion of a state's financial aid allocated to non need-based aid, which is also in the conceptual model's human capital category, was statistically related to the equity indices for all three groups, but in different, and somewhat unexpected directions. An increase of one standard deviation in the non need-based aid ratio was associated with increases of 0.12 and 0.43 percentage points, respectively, in the enrollment equity indices for Blacks and Latinos. Given Farrell's (2004) finding that Blacks and Latinos are typically underrepresented among merit-aid recipients this study's finding that non-need based grant aid was associated with increases in equity indices for these groups was



unexpected. However, the finding that there was a negative relationship between non need-based financial aid and enrollment equity indices for low-income students is consistent with previous research by Heller and Schwartz (2002) which found that low-income students were underrepresented among non-need based, state grant aid recipients. To this end, the results of the multivariate analyses show that an increase of one standard deviation in the non need-based aid ratio resulted in a 0.21 percentage point decrease in the enrollment equity indices for low-income students. This finding suggests that, since low-income students are underrepresented among merit aid recipients, increases in such aid lead to decreases in the enrollment equity indices for this group.

The room charges variable was also significantly related to the equity indices for all three groups, but again, the direction of the effect was inconsistent. An increase in room charges was negatively related to the equity indices for Black and Latino students, but positively related to the equity indices for low-income students. This finding could indicate that Black and Latino students may be more likely than others to enroll at community colleges or to live off-campus when attending four-year institutions because they find the costs of living in on-campus housing prohibitive.

A statistically significant relationship existed between several variables in the price of attendance and financial resources categories (i.e., ability to pay, in-state tuition, non need-based financial aid, required fees and room charges) and the enrollment equity indices for at least two of the three student groups. These analyses support previous research findings which suggest that students consider a variety of expenses associated with attending an institution before deciding to enroll, and are less likely to attend an

institution if the price associated with doing so exceeds their family's discretionary income (Cohn & Geske, 2004; Hossler et al, 1989; Kane, 1994).

Another measure of human capital, statewide unemployment rates, was statistically related to the enrollment equity indices for Black students only, and was the second strongest predictor of this dependent variable. An increase of one standard deviation in statewide unemployment rates was associated with a .24 percentage point decrease in Black student equity indices. This finding is different from previous research which suggests that as unemployment rates increase postsecondary enrollment rates will also increase. Kane's (1999) analyses found that a one percentage point increase in unemployment rates resulted in a 1% increase in enrollments at public institutions. However, Perna et al. (2005) found that Black student enrollments at Maryland's community colleges increased by 43% during a two-year period when the state's unemployment rate increased from 8.7% to 11.2%, but that increases in the unemployment rate did not influence Black student enrollments in the four-year sector. This study's findings may suggest that when the labor market is depressed Black students and their families are less likely than others to have the means to pay the costs associated with enrolling in a four-year institution, thereby resulting in a negative relationship between unemployment rates and enrollment equity indices for this group. The negative relationship between unemployment rates and enrollment equity indices for Black students might also indicate that, when labor market conditions are less than optimal, Blacks are "squeezed out" of the public four-year sector by students from other groups, and are more likely to enroll in two-year colleges.

None of the variables in the institutional isomorphism category had a statistically significant association with the equity indices for all three groups. However, a statistically significant relationship existed between 25<sup>th</sup> percentile SAT scores and acceptance ratio and the enrollment equity indices for Black and low-income students, but not for Latinos. There was a negative relationship between 25<sup>th</sup> percentile SAT scores and the equity indices for Black and low-income students. The results of these analyses are consistent with previous research which suggests that Black students are underrepresented among high SAT scorers, and overrepresented among students who receive low scores on the test (Bowen and Bok, 1998). Additionally, Hearn's (1991) analyses of the college destinations of high school graduates found that Black students and students from lower socio-economic status (SES) families were more likely to attend lower-selectivity institutions than students from other racial/ethnic or income groups. The results of the multivariate analyses which revealed a negative relationship between selectivity variables and enrollment equity indices for Black and low-income students are also consistent with Astin and Oseguera's (2004) research indicating that students from families in the lowest quartile of the parental income distribution were underrepresented in highly selective institutions (i.e., institutions with mean SAT scores of at least 1200).

None of the institutional expenditures variables were statistically related to the equity indices for any of the three student groups. Although Morphey and Baker's (2004) analyses revealed that the manner in which an institution distributes its expenditures may be indicative of isomorphic behavior patterns associated with decreased equity indices (e.g., increased selectivity) the present analyses do not suggest a relationship between institutional expenditures and enrollment equity indices. The

institutional spending variables did not have a statistically significant association to any of the dependent variables, after controlling for other variables in the conceptual model.

*Research Question Four: Effect of Flagship Status on Equity Indices*

While other research (e.g., Mortenson, 2004a; Mortenson, 2004b; Perna et al., 2006) has explored the status of equity for various groups at flagship universities, previous studies have not examined whether flagship status is a predictor of enrollment equity indices for underrepresented students. This study shows that after controlling for all other variables in the conceptual model flagship status is a significant negative predictor of undergraduate enrollment equity indices for Black and low-income students, but is unrelated to equity indices for Latino students. The negative relationship between flagship status and the enrollment equity indices for Black and low-income students is consistent with Turner and Pusser's (2004) assumption that some public flagship universities have become increasingly selective over the last three decades, and such increased selectivity has been accompanied by admissions policies that are inherently biased against low-income and minority students. However, this assertion does not explain why flagship status is not significantly related to the enrollment equity indices for low-income students. A review of this study's descriptive analyses shows that Latino students achieved equity at flagship universities in 20 states, but achieved equity at public four-year universities in only 13 states. The descriptive analyses also suggest that Latinos were more likely to achieve equity in undergraduate enrollments at flagship universities in states where they accounted for small proportions of the high school graduate population (e.g., Mississippi, Ohio and Vermont). This finding led me to

question whether the flagship status variable would be a predictor of equity indices in states that had more sizable proportions of Latino students. To examine this question I ran the regression analyses for Latino student equity indices, and limited the population of institutions to those located in states where Latinos comprised at least 10% of public high school graduates. I also ran the regression analyses for Black student equity indices and limited the population to institutions located in states where Black students represented at least 10% of public high school graduates.

The results of the supplemental regression analyses for Black and Latino students are included in Appendixes C and D, respectively. These analyses show that when the population of institutions was limited to states with a substantial population of Black or Latino high school graduates, the percent of variance in Black student equity indices explained by the model increased from 20% to 43%. Similarly, the model's ability to explain the variance in enrollment equity indices for Latino students increased 61% and the flagship variable was statistically significant when the supplemental regression analyses were conducted. These findings may be indicative of one of the study's limitations described in the first chapter, which is that institutions in states with small populations of underrepresented students might achieve equity in undergraduate enrollments even though students from these groups continue to account for a small proportion of their undergraduate student populations. The supplemental regression analyses may also suggest that the study's conceptual model is more effective at predicting enrollment equity indices when the target group comprises a "critical mass" of the relevant reference population.

This research question also examined the relationship between the highly-selective flagship variable and institutions' equity indices and the analyses revealed that there was not a statistically significant relationship between this independent variable and the equity indices for any of the three student groups. This may suggest that, on average, Black, Latino and low-income students are no more underrepresented at highly-selective flagships than at other flagship campuses. For example, of all 50 flagship universities, the equity index for Black students was lowest at the University of Georgia which was not deemed a highly-selective flagship campus. This finding may also indicate that in some cases, the flagship campus may be the only highly selective university in a state. Although the highly-selective flagship variable was not significantly related to the dependent variables, when the flagship and highly-selective flagship variables were added, the model's explanatory power increased for two of the three groups.

### Conclusions

At least five conclusions can be offered based upon this study's findings. First, it is critical to examine the status of equity for underrepresented student groups within the appropriate context. Examining equity in undergraduate enrollments by simply measuring annual increases or decreases in student headcounts does not account for concurrent increases or decreases in the relevant reference population. When analyzing equity at all public four-year universities, in the aggregate, and public flagship institutions, the state seems to provide the appropriate reference group. The most fitting reference population will likely be different when examining equity at private universities and, in some cases, at individual public institutions. For example, the relevant reference

group for some colleges may be comprised of students from a specific region as opposed to those from the entire state.

Second, this study suggests that, when exploring the status of equity for underrepresented groups it is prudent to examine each group separately. For example, grouping Black and Latino students together would have masked the finding that Blacks are more equitably represented at public four-year universities, in the aggregate, than at flagships, and that Latinos are more equitably represented at flagships than other public four-year universities. Additionally, while Blacks and Latinos are overrepresented among individuals from low-income families, it is important not to combine racial/ethnic minorities and low-income students under a single umbrella of underrepresented students when examining equity in undergraduate enrollments. In the context of this study, doing so would have hidden the finding that equity indices for low-income students increased at public four-year and flagship universities in a majority of states over the 10-year period from 1994 to 2004, while the indices for Black and Latino students decreased at these institutions in a majority of states during the same time frame. Similarly, examining separate equity indices for each group revealed that although equity indices for low-income students increased at both institutional types over the 10-year period examined, of all three student groups, their enrollment equity indices were generally the lowest at public four-year and flagship institutions across the 50 states. This finding suggests that individual institutions as well as public university systems as a whole must take proactive measures to recruit and enroll students from low-income backgrounds.

Third, the study's analyses revealed that, from 1994 to 2004, the equity indices for Blacks and Latinos decreased at a majority of public four-year universities and

flagship campuses. This finding suggests that the quest for enhanced prestige undertaken by many colleges and universities had an adverse impact on the enrollment equity indices for Black and Latino students. This assumption is supported by this study's analyses which indicate a negative relationship between some selectivity variables (i.e., 25<sup>th</sup> percentile SAT scores and acceptance ratio) and the enrollment equity indices for Blacks and Latinos. Individual state policy contexts may also be related to trends in the enrollment equity indices for various groups. For example, decreases in the equity indices for Black and Latino students over the 10-year period examined may also be indicative of challenges to using affirmative action in college admissions decisions which may have had a detrimental effect on Black and Latino student enrollments in the public four-year sector over the last decade. This was the case in California, where minority student applications, admissions offers and enrollments at University of California campuses declined after Proposition 209 was enacted (University of California, 2003). Trends that have resulted in lower equity indices for Black and Latino undergraduates may also be indicative of the consequences of race-neutral admissions policies. Research has found that eliminating affirmative action in admissions decisions decreases the percentage of minority students that enroll in selective public universities, and that race-neutral policy efforts such as the Texas 10 percent plan are not adequate substitutes for race-sensitive admissions policies (Brown & Hirschman, 2006; Lomibao, Barreto & Pachon, 2004).

Fourth, the results of the multivariate regression analyses, which explained between 20% and 34% of the variance in the dependent variables, suggest that institutional policies and practices are important contributors to their equity indices.



Unlike traditional college access models that rely primarily on student-level variables (e.g., background characteristics and levels of preparation) to examine individuals' college destinations, this study's findings suggest that variables that are determined by the institutions themselves (e.g., 25<sup>th</sup> percentile SAT scores, acceptance ratio, in-state tuition, amount of required fees, room charges) are also predictors of the types of students that enroll at different campuses.

Finally, this study shows that being a flagship university matters in terms of achieving equity in undergraduate enrollments for Black and low-income students. When the flagship variables were added to the conceptual model its explanatory power increased for two of three groups, and there was a statistically significant negative relationship between flagship status and the enrollment equity indices for these two groups. Additionally, the supplemental analyses that were conducted with a limited population of institutions that were located in states where at least 10% of high school graduates were either Black or Latino revealed that flagship status was significantly related to the equity indices for both groups at  $p < .001$ . These findings suggest that, if flagship universities are to reflect and educate the full citizenry of their states' populations, they must be particularly vigilant about creating and supporting outreach efforts designed to recruit and enroll underrepresented students.

### Implications for Policy, Practice and Research

Several implications for policy, practice and research emerged from this study's findings. The policy and practice implications are discussed first, followed by recommendations for future research.

### *Recommendations for Policy and Practice*

This study's findings suggest that the enrollment equity indices for Black, Latino and low-income students are below equity at public four-year institutions and flagship universities in a majority of states across the country. Given the changing demographics of the nation's population and the need to produce more college-educated workers to remain competitive in the global economy, this trend must be reversed (Carnevale, 2006; OECD, 2007). As one way to address this situation, policymakers and university-system governing boards should include enrollment equity measures in institutions' accountability plans. Bensimon et al. (2006) assert that the absence of such equity indicators in higher education performance plans has contributed to the increased inequality in educational outcomes for underrepresented students that were borne out in this study's findings.

To this end, 19 public university systems have recently taken a bold step towards eradicating the access inequities that exist within their institutions. Under the auspices of the *Access to Success Initiative* which is sponsored by the National Association of System Heads (NASH), these system leaders have agreed to cut in half the gaps in enrollment and degree completion rates that separate underrepresented minority and low-income students from achieving full equity, by the year 2015 (NASH, 2007). In other words, if underrepresented minority students have an enrollment equity index of 0.40 in a particular system in 2007, their enrollment equity gap is 0.60 (i.e.,  $1.0 - 0.40$ ). That particular system has committed to increase its minority student enrollment equity index to 0.70 (i.e., the 2007 enrollment equity index plus half of the gap [0.30] that separates

those students from achieving full equity) by 2015. A major component of the *Access to Success Initiative* will require campus presidents to closely examine their data and to know more than whether or not the enrollment rates of a particular student group increase or decrease from one year to the next. Instead, systems will use indices similar to those employed in this study to ensure that all student groups are moving toward reaching full equity in undergraduate enrollments.

Although the *Access to Success Initiative* was recently launched in October 2007, some university system chancellors have already incorporated its goals into their campus presidents' annual evaluation and salary review processes (Meredith & Clausen, 2007). In order to make progress on enhancing equity in undergraduate enrollments, other university system and institutional leaders should follow the course set by the 19 public university chancellors who have committed to, "an aggressive, highly focused effort to increase the number of college educated Americans overall, while closing gaps for underrepresented students" (NASH, 2007, p.3). To ensure that they move forward toward meeting their ambitious goals, participating systems have developed several workgroups that focus on issues (i.e., developmental education, institutional financial aid, transfers between 2 and 4-year institutions) that have traditionally served as barriers to access and success for students from underrepresented groups.

Second, there are substantial limitations in the availability of public data, and these shortcomings restrict researchers' ability to adequately examine the status of equity in undergraduate enrollments for low-income students. For example, the U.S. Department of Education does not collect enrollment data for freshmen based on Pell status, which means that equity indices for new low-income students cannot be easily

calculated. This problem could be rectified if the U.S. Department of Education added a Pell indicator to the Integrated Postsecondary Education Data System's enrollment survey, which would require institutions to report the number of their freshmen who receive Pell Grants. Additionally, data on how institutions disbursed their own financial aid resources, in terms of the proportion allocated to need and non need-based aid, are not publicly available. Since states are required to report the proportion of their financial aid budgets that are allocated to non need-based aid, public colleges and universities should be required to do so as well.

Third, this study's findings show that selected price of attendance variables (e.g., ability to pay, amount of in-state tuition, room charges, etc.) were statistically significant predictors of the enrollment equity indices for Black, Latino and low-income students. Therefore, institutions should analyze their institutional financial aid data to ensure that they are adequately supporting economically disadvantaged students. This recommendation is particularly important given prior research which suggests that some institutions have allocated growing shares of their discretionary financial aid dollars to the highest performing academic students who typically come from higher-income families, while a smaller share of institutional grant aid has been awarded to students with the greatest financial need (Ehrenberg, Zhang & Levin, 2006). This finding was confirmed by Gerald and Haycock's (2006) analyses which showed that from 1995 to 2003, the amount of institutional grant aid distributed by research-extensive universities to students from family's that earned less than \$20,000 annually decreased by 2% while the amount allocated to students from families earning more than \$100,000 annually increased by 19%. Given recent shifts in institutional financial aid allocations, college

and university leaders should know how their institutions are spending their own financial aid dollars and should examine if their non need-based aid allocations have a negative influence on their equity indices. University systems should also consider setting guidelines for the proportion of institutions' financial aid budgets that are distributed in the form of need-based and non need-based grants. This strategy would provide another mechanism for holding leaders of public institutions accountable for increasing their enrollment equity indices for low-income students.

Finally, in order to ensure that Black, Latino and low-income students are equitably represented in public four-year institutions, higher education and K-12 policymakers and leaders must work collaboratively to ensure that students from these groups receive the academic preparation necessary to be admitted to and successful in a four-year college. Although this study used Black and Latino high school graduates in each state as the relevant reference population for first-time, full-time freshmen from each group enrolled at public 4-year postsecondary institutions, this measure does not ensure that all high school graduates obtained the skills necessary for admission to a four-year college or university. To address this limitation, over the past five years, Achieve Inc., has taken the lead on working with states to align their high school graduation requirements with college and work-readiness standards (Achieve, 2006, 2007). According to their latest study, students in 13 states are currently required to complete a college and work-ready curriculum, which includes at least four years of mathematics through at least Algebra 2 and at least four years of English, to earn a high school diploma. Sixteen additional states are moving towards implementing similar graduation requirements (Achieve, 2007). To this end, K-12 educators, including teachers and

counselors, play an integral role in ensuring that today's elementary, middle and high school students are privy to and take advantage of the rigorous coursework that will enable them to be tomorrow's college students.

Additionally, to increase the enrollment equity indices for underrepresented students, higher education leaders must engage students and their families long before it is time for students to make decisions about which college to attend. Outreach initiatives designed to increase equity for these groups should not be the sole responsibility of multicultural affairs offices, or be perceived as isolated programs. To the contrary, these efforts need to be systemic, well-funded and supported by the highest levels of leadership if they are to lead to increased equity indices. Several examples of such endeavors exist at colleges and university systems throughout the country. Sponsored by Chancellor Charles Reed of the California State (Cal State) University System, Super Sundays are designed to increase the number of African Americans that enroll in Cal State campuses (Reed, 2007). Each Sunday during the month of February, Chancellor Reed, each of his campus presidents and numerous Cal State staff members visit African American churches throughout California to provide families with information about preparing for, applying to and enrolling in Cal State universities. During the last Super Sunday, the chancellor and Cal State staff members addressed thousands of African Americans who attended 18 churches throughout the state.

In an effort to ensure that more Latino students are prepared to enter college the Cal State System has partnered with the Parent Institute for Quality Education (PIQUE). This effort engages Latino parents, most of whom did not attend college themselves, in a nine-week course where they learn how to support their children's' academic endeavors

and to make sure that they are taking the steps necessary to be prepared for college (Capriccioso & Epstein, 2006). Last year, 30,000 Latino parents throughout California completed the nine-week program.

Some institutions have also implemented efforts to increase the college enrollment rates of students from low-income families. One such example, the College Advising Corps, is being sponsored by the Jack Kent Cooke Foundation, and involves several public universities that have recruited some of their recent graduates to work in low-income communities with a goal of improving their college-going rates. This program was launched at the University of Virginia in the 2005-2006 academic year when the university placed 14 of its recent alumni as college guides in nine school districts throughout the state, and at the end of the year several of the participating districts with college guides experienced substantial increases in their college-going rates (University of Virginia, 2006). For example, in Fluvanna County, the college enrollment rate increased from 63% to 83%, and in Patrick County the rate increased from 61% to 86%. Additionally, the number of students who took the SAT in Patrick County increased by 25%, and the number who completed and filed a financial aid application increased by nearly 50%. After its successful beginnings at the University of Virginia, the program was replicated at ten additional institutions in 2007, including the flagship universities in Alabama, California, Missouri, North Carolina and Utah (Jack Kent Cooke Foundation, 2007). Initiatives such as California State University System's Super Sundays and Pique partnership, and the College Advising Corp, if sustained, are likely to increase enrollment equity indices over time. Therefore, more colleges and universities

should develop focused outreach efforts that will increase the college-going rates of students from underrepresented backgrounds.

### *Recommendations for Future Research*

This study's findings contribute to a limited body of research that examines the status of equity in undergraduate enrollments within the public four-year postsecondary sector. It also adds to our understanding of college access by exploring whether there is a relationship between the pursuit of institutional prestige and the enrollment equity indices for underrepresented students. Despite this study's contributions, additional research is needed to more fully understand the status of equity for underrepresented students in colleges and universities. The following section highlights four areas for future research.

First, future analyses of equity in enrollments should be further disaggregated into two additional categories, historically Black colleges and universities (HBCUs) and predominately White institutions (PWIs). While the current study disaggregated institutions into flagship and non-flagship (i.e., all public four-year universities) categories, the findings suggest that the magnitude of the contribution of HBCUs to the equity indices for Black students at all four-year public colleges in some states may have been masked by this categorization. Therefore, to more accurately understand the status of equity in Black undergraduate enrollments at public universities across the country, future analyses of equity in postsecondary education should be disaggregated by the following four institutional categories: all public four-year institutions, historically Black colleges and universities, predominately White institutions, and flagship universities.



Disaggregating by these institutional types may also reveal that the equity indices for low-income students are higher or lower, on average, at either HBCUs or PWIs.

Second, future research should identify and include additional indicators of institutional isomorphism, and test whether a relationship exists between these variables and institutions' equity indices. In order to more fully examine correlations between the pursuit of prestige and institutions' equity indices, future studies should explore trends in variables that may be indicative of isomorphism such as changes in the average SAT scores of institutions' entering freshmen or in the proportion of their financial aid budgets allocated to non need-based aid, over a certain period of time. These data were unavailable at the time of the present study.

Third, additional research is needed to examine the effect of *U.S. News and World Report* rankings on institutional equity indices. Since many institutional leaders include plans to ascend the *U.S. News and World Report* rankings as a part of their strategic goals, and many college bound students and parents consult the publication during their college search processes, it is important to more fully understand if a relationship exists between these rankings and institutions' equity indices. Although there was not a statistically significant relationship between the highly selective flagship variable and the equity indices for Black, Latino or low-income students, this may have been, at least in part, due to the number of highly selective public universities that are not flagship campuses. For example, the most recent edition of *U.S. News and World Report's, America's Best Colleges* (2007), included several public non-flagship campuses, such as the University of California – Los Angeles, the College of William and Mary (VA) and the Georgia Institute of Technology, in its list of Top 50 National Universities. These

institutions would be considered highly selective campuses if I applied the criteria used to select public flagship institutions to all public four-year colleges and universities.

Therefore, future studies should compare highly selective public universities with other public universities to see if Black, Latino and low-income students are disproportionately underrepresented at these campuses, and to determine if highly selective status has a statistically significant effect on institutions' equity indices. Finally, future college access studies should include institutional level variables as a part of their conceptual models.

While traditional college access research (e.g., Cabrera & La Nasa, 2001; Perna, 2000; St. John, 1990) has included student level variables such as background race/ethnicity, socioeconomic status and levels of academic preparation that can be explained by cultural and social capital frameworks, this study's findings suggest that variables that are determined by colleges and universities themselves may pose barriers to access for underrepresented students. For example, this study's analyses revealed that 25<sup>th</sup> percentile SAT scores, acceptance ratio, amount of required fees and room charges, all variables which are within an institution's purview of control, had a statistically significant effect on institutions' equity indices. The results of these findings suggest that decisions that institutions themselves make contribute to their equity indices, and that the diversity of a college's student population is not solely determined by the abilities or background characteristics of their prospective students.

## Summary

The literature on the status of equity in undergraduate enrollments (e.g., Bensimon et al. (2006); Mortenson, 2004a; Mortenson, 2004b; Perna et al., 2006) suggests that Black, Latino and low-income students are generally underrepresented in public four-year postsecondary institutions. This study's results confirm these earlier analyses, and two of the findings that emerged from this research are particularly troubling. The first is that despite the fact that enrollment equity indices for low-income students increased at public four-year universities and flagship campuses in a majority of states from 1994 to 2004, these students remained significantly underrepresented at both types of institutions throughout the country. Second, the finding that the equity indices for Black and Latino students decreased at public four-year and flagship universities in a majority of states throughout the nation over the same period of time is equally as disconcerting. These analyses suggest that if the United States is to remain competitive with countries such as Japan, Korea which have made substantial strides in the proportion of their young people who have earned college degrees, institutions' enrollment equity indices for groups that have traditionally been underrepresented in higher education must improve (OECD, 2007).

While some colleges and universities have implemented programs designed to increase the representation of Black, Latino and low-income students, it is important to recognize that isolated endeavors are not capable of ensuring that groups achieve full equity in undergraduate enrollments. Instead, such efforts should be publicly supported by the highest levels of institutional leadership, and should be considered a fundamental component of key campus operations such as admissions, financial aid and institutional

research offices (Haycock, 2006). In the end, the institutions that are likely to make the most progress on improving their enrollment equity indices are those that are unabashedly committed to doing so.

## Appendix A. List of Public Four-Year Institutions Included in the Analytic Population

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Alabama A & M University  
 University of Alabama at Birmingham  
 University of Alabama in Huntsville  
 Alabama State University  
 The University of Alabama  
 Auburn University-Montgomery  
 Auburn University Main Campus  
 Jacksonville State University  
 University of West Alabama  
 University of Montevallo  
 University of North Alabama  
 University of South Alabama  
 Troy University  
 University of Alaska Anchorage  
 University of Alaska Fairbanks  
 University of Alaska Southeast  
 Arizona State University at the Tempe Campus  
 Arizona State University at the West Campus                      2004 only  
 University of Arizona  
 Northern Arizona University  
 University of Arkansas at Little Rock  
 University of Arkansas Main Campus  
 University of Arkansas at Pine Bluff  
 Arkansas State University-Main Campus  
 Arkansas Tech University  
 University of Arkansas at Monticello  
 University of Central Arkansas  
 Henderson State University  
 Southern Arkansas University Main Campus  
 University of Arkansas-Fort Smith  
 California Polytechnic State University-San Luis Obispo  
 California State University-Bakersfield  
 California State University-Stanislaus  
 California State University-San Bernardino  
 California State Polytechnic University-Pomona  
 California State University-Channel Islands                      2004 only  
 California State University-Chico  
 California State University-Dominguez Hills  
 California State University-Fresno  
 California State University-Fullerton

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Source: Analyses of IPEDS 1994 and 2004

Appendix A. Continued. List of Public Four-Year Institutions Included in the Analytic Population

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California State University-East Bay	
California State University-Long Beach	
California State University-Los Angeles	
California State University-Northridge	
California State University-Sacramento	
California State University-San Marcos	2004 only
University of California-Berkeley	
University of California-Davis	
University of California-Irvine	
University of California-Los Angeles	
California State University-Monterey Bay	2004 only
University of California-Riverside	
University of California-San Diego	
University of California-Santa Barbara	
University of California-Santa Cruz	
California Maritime Academy	
Humboldt State University	
San Diego State University	
San Diego State University-Imperial Valley Campus	2004 only
San Francisco State University	
San Jose State University	
Sonoma State University	
Adams State College	
University of Colorado at Denver and Health Sciences Center	
University of Colorado at Colorado Springs	
University of Colorado at Boulder	
Colorado School of Mines	
Colorado State University	
Fort Lewis College	
Mesa State College	
Metropolitan State College of Denver	
University of Northern Colorado	
Colorado State University-Pueblo	
Western State College of Colorado	
Central Connecticut State University	
University of Connecticut	
University of Connecticut-Tri-Campus	2004 only
University of Connecticut-Avery Point	2004 only
University of Connecticut-Stamford	2004 only
Eastern Connecticut State University	
Southern Connecticut State University	

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Source: Analyses of IPEDS 1994 and 2004

Appendix A. Continued. List of Public Four-Year Institutions Included in the Analytic Population

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Western Connecticut State University  
Delaware State University  
University of Delaware  
University of Central Florida  
Chipola College  
Daytona Beach Community College  
Edison College  
Florida Agricultural and Mechanical University  
Florida Atlantic University  
Florida Gulf Coast University      2004 only  
Florida International University  
Florida State University  
University of Florida  
Miami Dade College  
New College of Florida      2004 only  
University of North Florida  
Okaloosa-Walton College  
St Petersburg College  
University of South Florida  
The University of West Florida  
Albany State University  
Armstrong Atlantic State University  
Augusta State University  
Clayton State University  
Columbus State University  
Dalton State College  
Fort Valley State University  
Georgia Institute of Technology-Main Campus  
Georgia Southwestern State University  
Gainesville State College  
Georgia College & State University  
Georgia Southern University  
Georgia State University  
University of Georgia  
Kennesaw State University  
Macon State College  
North Georgia College & State University  
Savannah State University  
Southern Polytechnic State University  
Valdosta State University  
University of West Georgia

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Source: Analyses of IPEDS 1994 and 2004

Appendix A. Continued. List of Public Four-Year Institutions Included in the Analytic Population

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University of Hawaii at Hilo  
University of Hawaii at Manoa  
Maui Community College  
Boise State University  
Idaho State University  
University of Idaho  
Lewis-Clark State College  
Chicago State University  
Eastern Illinois University  
University of Illinois at Chicago  
University of Illinois at Urbana-Champaign  
Illinois State University  
Northern Illinois University  
Northeastern Illinois University  
University of Illinois at Springfield  
Southern Illinois University Carbondale  
Southern Illinois University Edwardsville  
Western Illinois University  
Ball State University  
Indiana University-Purdue University-Fort Wayne  
Indiana University-Purdue University-Indianapolis  
University of Southern Indiana  
Indiana State University  
Indiana University-Kokomo  
Indiana University-South Bend  
Indiana University-Bloomington  
Indiana University-Northwest  
Indiana University-Southeast  
Indiana University-East  
Purdue University-Calumet Campus  
Purdue University-Main Campus  
Purdue University-North Central Campus  
Vincennes University  
Iowa State University  
University of Iowa  
University of Northern Iowa  
Emporia State University  
Fort Hays State University  
Haskell Indian Nations University  
University of Kansas Main Campus  
Kansas State University

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Source: Analyses of IPEDS 1994 and 2004



Appendix A. Continued. List of Public Four-Year Institutions Included in the Analytic Population

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Pittsburg State University  
Washburn University  
Wichita State University  
Eastern Kentucky University  
Kentucky State University  
University of Kentucky  
University of Louisville  
Morehead State University  
Murray State University  
Northern Kentucky University  
Western Kentucky University  
Grambling State University  
Louisiana State University at Alexandria  
Louisiana State University and Agricultural & Mechanical College  
Louisiana State University-Shreveport  
Louisiana Tech University  
McNeese State University  
University of New Orleans  
Nicholls State University  
University of Louisiana at Monroe  
Northwestern State University of Louisiana  
Southeastern Louisiana University  
Southern University and A & M College  
Southern University at New Orleans  
University of Louisiana at Lafayette  
University of Maine at Augusta  
University of Maine at Farmington  
University of Maine at Fort Kent  
University of Maine at Machias  
University of Maine  
Maine Maritime Academy  
University of Maine at Presque Isle  
University of Southern Maine  
Bowie State University  
Coppin State University  
Frostburg State University  
University of Maryland-University College  
University of Maryland-Baltimore County  
University of Maryland-College Park  
University of Maryland-Eastern Shore  
Morgan State University

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Source: Analyses of IPEDS 1994 and 2004

Appendix A. Continued. List of Public Four-Year Institutions Included in the Analytic Population

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Salisbury University  
St Mary's College of Maryland  
Towson University  
Bridgewater State College  
Fitchburg State College  
Framingham State College  
Benjamin Franklin Institute of Technology  
University of Massachusetts-Lowell  
University of Massachusetts-Amherst  
University of Massachusetts-Boston  
Massachusetts College of Art  
Massachusetts Maritime Academy  
Massachusetts College of Liberal Arts  
Salem State College  
University of Massachusetts-Dartmouth  
Westfield State College  
Worcester State College  
Central Michigan University  
Eastern Michigan University  
Ferris State University  
Grand Valley State University  
Lake Superior State University  
University of Michigan-Ann Arbor  
Michigan State University  
Michigan Technological University  
University of Michigan-Dearborn  
University of Michigan-Flint  
Northern Michigan University  
Oakland University  
Saginaw Valley State University  
Wayne State University  
Western Michigan University  
Bemidji State University  
Minnesota State University-Mankato  
Metropolitan State University  
University of Minnesota-Twin Cities  
University of Minnesota-Crookston  
University of Minnesota-Duluth  
University of Minnesota-Morris  
Minnesota State University-Moorhead  
Saint Cloud State University

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Source: Analyses of IPEDS 1994 and 2004

Appendix A. Continued. List of Public Four-Year Institutions Included in the Analytic Population

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Southwest Minnesota State University  
Winona State University  
Alcorn State University  
Delta State University  
Jackson State University  
University of Mississippi Main Campus  
Mississippi University for Women  
Mississippi Valley State University  
Mississippi State University  
University of Southern Mississippi  
University of Central Missouri  
Harris-Stowe State University  
Lincoln University  
Missouri Southern State University  
Missouri Western State University  
University of Missouri-Columbia  
University of Missouri-Kansas City  
University of Missouri-Rolla  
University of Missouri-St Louis  
Truman State University  
Northwest Missouri State University  
Southeast Missouri State University  
Missouri State University  
Montana State University-Billings  
Montana Tech of the University of Montana  
Montana State University-Bozeman  
The University of Montana  
Montana State University-Northern  
The University of Montana-Western  
Chadron State College  
University of Nebraska at Kearney  
University of Nebraska at Omaha  
University of Nebraska at Lincoln  
Peru State College  
Wayne State College  
Community College of Southern Nevada  
Nevada State College at Henderson 2004 only  
University of Nevada-Las Vegas  
University of Nevada-Reno  
Great Basin College  
University of New Hampshire-Main Campus

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Source: Analyses of IPEDS 1994 and 2004

Appendix A. Continued. List of Public Four-Year Institutions Included in the Analytic Population

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Keene State College  
University of New Hampshire-Manchester  
Plymouth State University  
Granite State College  
Rowan University  
New Jersey City University  
Kean University  
Montclair State University  
New Jersey Institute of Technology  
Ramapo College of New Jersey  
Rutgers University-Camden  
Rutgers University-New Brunswick/Piscataway  
Rutgers University-Newark  
The Richard Stockton College of New Jersey  
The College of New Jersey  
William Paterson University of New Jersey  
Eastern New Mexico University-Main Campus  
Institute of American Indian and Alaska Native Culture  
New Mexico Highlands University  
New Mexico Institute of Mining and Technology  
University of New Mexico-Main Campus  
New Mexico State University-Main Campus  
Northern New Mexico College  
Western New Mexico University  
CUNY Bernard M Baruch College  
CUNY Brooklyn College  
CUNY College of Staten Island  
CUNY City College  
CUNY Hunter College  
CUNY John Jay College Criminal Justice  
CUNY Lehman College  
CUNY Medgar Evers College  
CUNY New York City College of Technology  
CUNY Queens College  
CUNY York College  
Fashion Institute of Technology  
SUNY College of Technology at Alfred  
SUNY College of Technology at Canton  
SUNY College of Technology at Delhi  
SUNY College of Agriculture and Technology at Cobleskill  
Farmingdale State University of New York

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Source: Analyses of IPEDS 1994 and 2004

Appendix A. Continued. List of Public Four-Year Institutions Included in the Analytic Population

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Morrisville State College  
SUNY at Albany  
SUNY at Binghamton  
SUNY at Buffalo  
Stony Brook University  
SUNY College of Environmental Science and Forestry  
SUNY Institute of Technology at Utica-Rome  
SUNY College at Brockport  
SUNY College at Buffalo  
SUNY College at Cortland  
SUNY at Fredonia  
SUNY at Geneseo  
SUNY College at New Paltz  
SUNY College at Oneonta  
SUNY College at Oswego  
SUNY-Potsdam  
SUNY College at Purchase  
SUNY College at Old Westbury  
SUNY College at Plattsburgh  
SUNY Empire State College  
SUNY Maritime College  
Appalachian State University  
East Carolina University  
Elizabeth City State University  
Fayetteville State University  
North Carolina A & T State University  
University of North Carolina at Asheville  
University of North Carolina at Chapel Hill  
University of North Carolina at Charlotte  
University of North Carolina at Greensboro  
North Carolina Central University  
North Carolina School of the Arts  
North Carolina State University at Raleigh  
University of North Carolina-Wilmington  
University of North Carolina at Pembroke  
Winston-Salem State University  
Western Carolina University  
Dickinson State University  
Mayville State University  
Minot State University  
University of North Dakota

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Source: Analyses of IPEDS 1994 and 2004

Appendix A. Continued. List of Public Four-Year Institutions Included in the Analytic Population

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North Dakota State University-Main Campus  
Sitting Bull College  
Valley City State University  
University of Akron Main Campus  
Bowling Green State University-Main Campus  
Central State University  
University of Cincinnati-Main Campus  
University of Cincinnati-Raymond Walters College  
Cleveland State University  
Edison State Community College  
Kent State University-Salem Campus  
Kent State University-Kent Campus  
Miami University-Hamilton  
Miami University-Middletown  
Miami University-Oxford  
Ohio State University-Lima Campus  
Ohio State University-Mansfield Campus  
Ohio State University-Marion Campus  
Ohio State University-Newark Campus  
Ohio State University-Main Campus  
Ohio University-Eastern Campus  
Ohio University-Chillicothe Campus  
Ohio University-Southern Campus  
Ohio University-Lancaster Campus  
Ohio University-Main Campus  
Ohio University-Zanesville Campus  
Shawnee State University  
University of Toledo-Main Campus  
Wright State University-Main Campus  
Youngstown State University  
Cameron University  
University of Central Oklahoma  
East Central University  
Langston University  
Northeastern State University  
Northwestern Oklahoma State University  
Oklahoma Panhandle State University  
Oklahoma State University-Main Campus  
University of Oklahoma Norman Campus  
Oklahoma State University-Okmulgee  
Rogers State University

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Source: Analyses of IPEDS 1994 and 2004

Appendix A. Continued. List of Public Four-Year Institutions Included in the Analytic Population

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University of Science and Arts of Oklahoma  
Southeastern Oklahoma State University  
Southwestern Oklahoma State University  
Eastern Oregon University  
Oregon Institute of Technology  
Oregon State University  
University of Oregon  
Portland State University  
Southern Oregon University  
Western Oregon University  
Bloomsburg University of Pennsylvania  
California University of Pennsylvania  
Cheyney University of Pennsylvania  
Clarion University of Pennsylvania  
East Stroudsburg University of Pennsylvania  
Edinboro University of Pennsylvania  
Indiana University of Pennsylvania-Main Campus  
Kutztown University of Pennsylvania  
Lincoln University of Pennsylvania  
Lock Haven University of Pennsylvania  
Mansfield University of Pennsylvania  
Millersville University of Pennsylvania  
Pennsylvania College of Technology  
Pennsylvania State University-Penn State Erie-Behrend College  
Pennsylvania State University-Penn State New Kensington  
Pennsylvania State University-Penn State Shenango  
Pennsylvania State University-Penn State Wilkes-Barre  
Pennsylvania State University-Penn State Worthington Scranton  
Pennsylvania State University-Penn State Lehigh Valley  
Pennsylvania State University-Penn State Altoona  
Pennsylvania State University-Penn State Beaver  
Pennsylvania State University-Penn State Berks  
Pennsylvania State University-Penn State Harrisburg  
Pennsylvania State University-Penn State Delaware County  
Pennsylvania State University-Penn State Dubois  
Pennsylvania State University-Penn State Fayette- Eberly Campus  
Pennsylvania State University-Penn State Hazleton  
Pennsylvania State University-Penn State Main Campus  
Pennsylvania State University-Penn State Greater Allegheny  
Pennsylvania State University-Penn State Mont Alto  
Pennsylvania State University-Penn State Abington

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Source: Analyses of IPEDS 1994 and 2004

Appendix A. Continued. List of Public Four-Year Institutions Included in the Analytic Population

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Pennsylvania State University-Penn State Schuylkil  
Pennsylvania State University-Penn State York  
University of Pittsburgh-Bradford  
University of Pittsburgh-Greensburg  
University of Pittsburgh-Johnstown  
University of Pittsburgh-Main Campus  
Shippensburg University of Pennsylvania  
Slippery Rock University of Pennsylvania  
Temple University  
West Chester University of Pennsylvania  
Rhode Island College  
University of Rhode Island  
College of Charleston  
Citadel Military College of South Carolina  
Clemson University  
Francis Marion University  
Lander University  
University of South Carolina-Aiken  
University of South Carolina-Beaufort  
University of South Carolina-Columbia  
Coastal Carolina University  
South Carolina State University  
University of South Carolina-Upstate  
Winthrop University  
Black Hills State University  
Si Tanka University-Eagle Butte Campus  
Dakota State University  
Northern State University  
Oglala Lakota College  
South Dakota School of Mines and Technology  
South Dakota State University  
University of South Dakota  
Austin Peay State University  
East Tennessee State University  
University of Memphis  
Middle Tennessee State University  
The University of Tennessee at Chattanooga  
The University of Tennessee  
The University of Tennessee-Martin  
Tennessee State University  
Tennessee Technological University

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Source: Analyses of IPEDS 1994 and 2004



Appendix A. Continued. List of Public Four-Year Institutions Included in the Analytic Population

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Angelo State University  
Brazosport College  
Texas A & M University-Corpus Christi  
Texas A & M University-Commerce  
University of Houston-Downtown  
University of Houston  
Lamar University  
Texas A & M International University  
Midland College  
Midwestern State University  
University of North Texas  
The University of Texas-Pan American  
The University of Texas at Brownsville  
Prairie View A & M University  
Sam Houston State University  
Stephen F Austin State University  
South Texas College      2004 only  
Sul Ross State University  
Tarleton State University  
Texas A & M University-Kingsville  
Texas A & M University at Galveston  
Texas A & M University  
Texas State University-San Marcos  
The University of Texas at Austin  
The University of Texas at Dallas  
The University of Texas at El Paso  
The University of Texas at Tyler  
The University of Texas of the Permian Basin  
The University of Texas at San Antonio  
Texas Southern University  
Texas Tech University  
Texas Woman's University  
West Texas A & M University  
Dixie State College of Utah  
Southern Utah University  
Utah State University  
Utah State University-Continuing Education      2004 only  
Utah Valley State College  
University of Utah  
Weber State University  
Castleton State College

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Source: Analyses of IPEDS 1994 and 2004

Appendix A. Continued. List of Public Four-Year Institutions Included in the Analytic Population

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Johnson State College  
Lyndon State College  
Vermont Technical College  
University of Vermont  
College of William and Mary  
Christopher Newport University  
George Mason University  
James Madison University  
Longwood University  
University of Mary Washington  
Norfolk State University  
Old Dominion University  
Radford University  
The University of Virginia's College at Wise  
Virginia Polytechnic Institute and State University  
Virginia Commonwealth University  
University of Virginia-Main Campus  
Virginia Military Institute  
Virginia State University  
Central Washington University  
Eastern Washington University  
The Evergreen State College  
Peninsula College  
Washington State University  
University of Washington-Seattle Campus  
Western Washington University  
Bluefield State College  
Concord University  
Fairmont State University  
Glennville State College  
Marshall University  
West Virginia University at Parkersburg  
Shepherd University  
West Virginia State University  
West Liberty State College  
West Virginia University Institute of Technology  
West Virginia University  
University of Wisconsin-Whitewater  
University of Wisconsin-Eau Claire  
University of Wisconsin-Green Bay  
University of Wisconsin-La Crosse

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Source: Analyses of IPEDS 1994 and 2004

Appendix A. Continued. List of Public Four-Year Institutions Included in the Analytic Population

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University of Wisconsin-Oshkosh

University of Wisconsin-Parkside

University of Wisconsin-Stout

University of Wisconsin-Superior

University of Wisconsin-Madison

University of Wisconsin-Milwaukee

University of Wisconsin-Platteville

University of Wisconsin-River Falls

University of Wisconsin-Stevens Point

University of Wyoming

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Source: Analyses of IPEDS 1994 and 2004

## Appendix B. List of Public Four-Year Institutions Excluded from the Analytic Population

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Athens State University  
University of Arkansas for Medical Sciences  
University of California Hastings College of Law  
University of California–San Francisco  
Naval Postgraduate School  
United States Air Force Academy  
Charter Oak State College  
United States Coast Guard Academy  
University of the District of Columbia  
Medical College of Georgia  
University of Hawaii-West Oahu  
Governors State University  
University of Kansas Medical Center  
Louisiana State University Health Sciences Center at New Orleans  
University of Baltimore  
University of Maryland-Baltimore  
Uniformed Services University of the Health Sciences  
United States Naval Academy  
University of Massachusetts Medical School Worcester  
University of Mississippi Medical Center  
Truman Medical Center School for Nurse Anesthesia  
University of Nebraska Medical Center  
Thomas Edison State College  
University of Medicine and Dentistry of New Jersey  
CUNY Graduate School and University Center  
CUNY School of Law at Queens College  
United States Merchant Marine Academy  
United States Military Academy  
SUNY College of Optometry  
SUNY Health Science Center at Brooklyn  
SUNY Health Science Center at Syracuse  
Air Force Institute of Technology-Graduate School of Engineering & Management  
University of Toledo-Health Science Campus  
Northeastern Ohio Universities College of Medicine  
Oklahoma State University Center for Health Sciences  
University of Oklahoma Health Sciences Center  
Oregon Health & Science University  
The Dickinson School of Law of the Pennsylvania State University  
Pennsylvania State University-Penn State Great Valley  
Pennsylvania State University-Penn State Hershey College of Medicine

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Source: Analyses of IPEDS 1994 and 2004

Appendix B. Continued. List of Public Four-Year Institutions Excluded from the Analytic Population

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Medical University of South Carolina  
Texas A & M University System Health Science Center  
Texas A & M University-Texarkana  
University of Houston-Clear Lake  
University of Houston-Victoria  
University of Texas Southwestern Medical Center at Dallas  
The University of Texas Health Science Center at San Antonio  
The University of Texas Medical Branch  
University of North Texas Health Science Center  
The University of Texas Health Science Center at Houston  
Texas Tech University Health Sciences Center  
West Virginia School of Osteopathic Medicine  
The University of Connecticut School of Medicine and Dentistry  
University of the District of Columbia David A Clarke School of Law  
University of Washington-Bothell Campus  
University of Washington-Tacoma Campus  
The University of Texas M.D. Anderson Cancer Center  
Arizona State University at the Polytechnic Campus  
Education Service Center-Region 2  
Louisiana State University Health Sciences Center-Shreveport  
Oregon State University-Cascades Campus  
Southern University Law Center  
University of California-Merced  
Georgia Gwinnett College  
Arizona State University at the Downtown Phoenix Campus

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Source: Analyses of IPEDS 1994 and 2004

Appendix C. Correlations Between Flagship Status and Highly Selective Flagship Status Variables and other Variables in Conceptual Model.

Variable	<u>Flagship</u>	<u>Highly Selective Flagship</u>
25 <sup>th</sup> Percentile SAT Score	.371	.250
Ability to Pay	-.052	.036
Acceptance Ratio	-.027	-.130
Board Charges	.162	.151
In-state Tuition	.104	.061
Non need-based Aid	.019	-.009
Required Fees	.019	.042
Room Charges	.018	.027
Unemployment Rate	-.084	.069
Institutional Expenses	-.306	-.135
Instructional Expenses	-.291	-.113
Research Expenses	.488	.204

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Source: Analyses of IPEDS, IPUMS, Postsecondary Opportunity and WICHE data

Appendix D. Supplemental Regression Analyses for Variables Predicting Equity Indices for Black Students in All States (Equation 1) and in States Where Black Students Account for at least 10% of High School Graduates (Equation 2).

Variable	Equation 1		Equation 2	
	b	Beta	b	Beta
25 <sup>th</sup> Percentile SAT Scores	.00	-.16**	.00	-.11*
Ability to Pay	2.60	.33***	.00	.00
Acceptance Ratio	.18	.08*	-.01	-.01
Board Charges	.00	.03	.00	.00
In-state Tuition	.00	-.19**	.00	-.15*
Non need-based aid	.13	.11**	-.24	-.36***
Required Fees	.00	.13*	.00	-.20***
Room Charges	.00	-.23***	.00	-.07
Unemployment Rate	-11.38	-.26***	.03	.00
Institutional Expenses	-.19	-.02	-.34	-.06
Instructional Expenses	-.33	.07	.05	.02
Research Expenses	.80	.17**	.45	.13*
Flagship	-.29	-.23***	-.55	-.55***
Highly Selective Flagship	-.08	-.03	.05	.02
R <sup>2</sup>		.24		.43

Source: Analyses of IPEDS, IPUMS, Postsecondary Opportunity and WICHE data. b=unstandardized regression coefficient; Beta=standardized regression coefficient.

\*p<.05; \*\*p<.01; \*\*\*p<.001

Appendix E. Supplemental Regression Analyses for Variables Predicting Equity Indices for Latino Students in All States (Equation 1) and in States Where Latino Students Account for at least 10% of High School Graduates (Equation 2).

Variable	Equation 1		Equation 2	
	b	Beta	b	Beta
25 <sup>th</sup> Percentile SAT Scores	.00	.01	.00	.15*
Ability to Pay	3.94	.46***	1.21	.14
Acceptance Ratio	-.07	-.03	-.31	-.18**
Board Charges	.00	.03	.00	-.03
In-state Tuition	.00	-.11*	.00	.31**
Non need-based aid	.51	.43***	.56	.51***
Required Fees	.00	-.27***	.00	-.28**
Room Charges	.00	-.09*	.00	.17*
Unemployment Rate	-2.80	-.06	9.68	.18*
Institutional Expenses	-.11	.01	1.00	.14*
Instructional Expenses	-.29	-.06	.13	.04
Research Expenses	.18	.04	.18	.05
Flagship	.10	.07	-.48	-.41***
Highly Selective Flagship	-.17	-.05	.00	.00
R <sup>2</sup>		.34		.61

Source: Analyses of IPEDS, IPUMS, Postsecondary Opportunity and WICHE data. b=unstandardized regression coefficient; Beta=standardized regression coefficient.

\*p<.05; \*\*p<.01; \*\*\*p<.001



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