

FINANCIAL FACTORS AND INSTITUTIONAL CHARACTERISTICS THAT
EXPLAIN UNDERGRADUATE ENROLLMENT BY
LOW-INCOME STUDENTS AT PUBLIC
MASTER'S-LEVEL INSTITUTIONS

by

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ABSTRACT

Low-income students continue to struggle with the rising costs of higher education. Four-year college tuition typically exceeds financial aid awarded to undergraduates at public institutions. St. John (2005) contended that grant amounts remain inadequate for low-income students. Tinto (2008) highlighted the growing income stratification within higher education, particularly at four-year institutions.

This research study focused on institution-level variables in an attempt to characterize the way that particular financial and institutional elements impact low-income undergraduate enrollment at public master's-level institutions. A thorough review of literature was conducted on college choice, costs and benefits of higher education, the problem of affordability, effects of financial aid, characteristics of low-income students, and enrollment rates by race, gender, and income level. This study expanded upon previous literature, which explored the relationship between college costs, financial aid, and higher education opportunities for diverse groups.

This study involved a secondary analysis of data from five sources: 1) the National Center for Education Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS), 2) the Delta Cost Project, 3) The College Board's *2009 Annual Survey of Colleges*, 4) the U.S. Census Bureau categorization of four geographic regions of the United States, and 5) the unpublished dissertation, "A Geographical Classification of Master's Colleges and Universities," by Dr. Clint Kinkead. In order to explore the ways that financial factors and institutional characteristics differed across public master's-level institutions in the U.S., based upon

geographic region, 2005 Carnegie Basic Classification, and campus setting, this data was analyzed first using descriptive statistics. Then, multiple linear regression analysis was conducted in order to determine which combination of factors was statistically significant in explaining low-income undergraduate enrollment at public master's-level institutions.

Smaller, urban institutions were most effective at enrolling low-income undergraduate students in the 2007-2008 academic year. Institutions located in the West and South enrolled the highest number and greatest percentage, respectively, of low-income undergraduate students. The findings, conclusions, and recommendations of this study may provide useful guidance to higher education policymakers and practitioners concerning the development of policies and practices that better meet the needs of low-income undergraduate students seeking to enroll in public master's-level institutions.

LIST OF ABBREVIATIONS AND SYMBOLS

| | |
|-------|-------------------------------------------------|
| ASC | Annual Survey of Colleges |
| ASHE | Association for the Study of Higher Education |
| COA | Cost of Attendance |
| DCP | Delta Cost Project |
| EF | Fall Enrollment |
| EFC | Expected Family Contribution |
| F | Finance |
| FAFSA | Free Application for Federal Student Aid |
| FISAP | Financial Institution Shared Assessment Program |
| FTI | FISAP Total Income |
| GPA | Grade Point Average |
| HBCU | Historically Black College or University |
| HERI | Higher Education Research Institute |
| IC | Institutional Characteristics |
| IPEDS | Integrated Postsecondary Education Data System |
| IRB | Institutional Review Board |
| NCES | National Center for Education Statistics |
| NELS | National Education Longitudinal Study |
| SES | Socioeconomic Status |
| SFA | Student Financial Aid |

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CHAPTER I:

INTRODUCTION

Introduction to the Problem

Enrollment rates of low-income students at selective (and more costly) colleges have been declining steadily for the past 15 years (Schmidt, 2010). According to *The American Freshman*, one of the forty-year trends is that parental income is rising dramatically (Pryor, Hurtado, Saenz, Santos, & Korn, 2007). The gap continues to grow between advantaged and disadvantaged families, and the socioeconomic disparity remains apparent. Evidence of this challenge is clear in the growing trend for low-income students to attend two-year, rather than four-year, institutions (Corrigan, 2003; Paulsen & St. John, 2002; Tinto, 2008). Similarly, Perna and Li (2006) posited that “the decline in affordability has restricted students’ choice of college to attend” (pp. 19-20). Indeed, without appropriate support, access does not equal opportunity.

Rising tuition, combined with diminishing state support for higher education, has drawn public attention to access and diversity at four-year public institutions, in particular (Steinberg, Piraino, & Haveman, 2009). Low-income students encounter a financial squeeze that often impedes their access to four-year institutions. As noted by Perna and Titus (2004), low socioeconomic status (SES) high school graduates are less likely than their peers to enroll in college. Those who do enroll are more likely to select a two-year versus a four-year in-state public institution (Perna, Rowan-Kenyon, Bell, Thomas, & Li, 2008). Consequently, higher education enrollment opportunities are more accessible to high-income students, raising concern about income distribution at four-year colleges and universities in the American higher education

system (Steinberg et al., 2009). All of these findings reiterate the ongoing stratification by socioeconomic status in higher education choice and access (Thomas & Perna, 2004).

The net price of attending a four-year public institution constitutes a greater percentage of family income for needy students compared to wealthy students, resulting in a growing gap between the college aspirations of these students and where they can afford to enroll (Advisory Committee on Student Financial Assistance, 2010). Such an extreme financial burden results in a shift in enrollment away from four-year colleges to two-year institutions, which is worrisome from a social justice perspective. Where qualified students begin college has a substantial impact on their eventual success in degree attainment (Advisory Committee on Student Financial Assistance, 2010).

College affordability is measured by the price of college attendance and also the ability to pay (Heller, 2001). The dilemma of affordability is a great challenge for low-income students, including a significant portion of racial/ethnic minorities. Poverty levels remain significantly higher for Blacks and Hispanics, as compared to Whites. According to the most recent U.S. Census Report, one of every seven Americans lives in poverty, an overall rate of 14.3% (Morello, 2010). The growing disparity of family income, coupled with the shift from need-based to merit-based aid, has impacted college choice for low-income students in a negative way (McPherson & Schapiro, 1998; Steinberg et al., 2009). The likelihood of low-income students pursuing higher education has been on the decline since the 1970s. If these students do enroll, their choice is more likely to be a two-year institution rather than a four-year college or university (Steinberg et al., 2009). Indeed, poor minority students are not distributed equally across different types of public institutions (Astin, 1994; The College Board, 2009b). However,

educating all citizens and preparing them to be future contributors to society is a matter of public interest (Astin, 1994).

Significant disparities in college access have been observed in recent years, with a growing gap in enrollment and graduation among various income groups. Students from high-income families have a significantly increased likelihood of attending college as compared to those from lower-income families (Walpole, 2003). The timing of enrollment also appears to differ by income and race/ethnicity, with students from high-income families enrolling immediately after high school at a substantially higher rate (20%) than their low-income peers, and Whites matriculating at consistently higher rates than Blacks or Hispanics (U.S. Department of Education, National Center for Education Statistics, 2010). The attainment level of students from the top decile of family income is substantially higher than that of the students in the bottom decile as well, which reinforces the association between educational attainment and economic status (Haveman & Smeeding, 2006). While access-related goals are broader than the concept of diversity, the outcomes of improving access tend to benefit diverse student groups (The College Board, 2009a).

Truly, such differences in enrollment patterns indicate “that postsecondary education plays an important role in both perpetuating and breaking the pattern of class reproduction” (Paulsen & St. John, 2002, p. 224). Low-income students face financial constraints that limit their college choices and consequently impede their social mobility. Recruiting low-income students has gained momentum in recent years, due to growing concerns about access as well as the disproportionately high number of privileged, or wealthy, students at selective institutions (Schmidt, 2010). Furthermore, Walpole (2003) acknowledged numerous calls for research concerning students from low socioeconomic backgrounds and their educational disadvantage,

asserting that “promoting an opportunity structure through educational attainment is a critical piece of our social policy” (p. 46).

Schmidt (2010) identified working class, or low-income, students as “one of the most underrepresented minority groups at many four-year colleges” (¶ 1). For most low-income students, financial aid is a key aspect in financing higher education (Nora, 2001). Financial aid programs can equalize access for students with varying abilities to pay; however, the effects of financial aid fluctuate depending on the aid type (DesJardins, Ahlburg, & McCall, 2006). Historically, low-income students have been more reactionary to changes in tuition as well as aid availability, under-investing in college when tuition rises without a corresponding increase in financial aid (Heller, 1997; Kim, DesJardins, & McCall, 2009). Kim et al. (2009) argued that “a solid understanding of the impact of financial aid on college choice is critical to help maintain the enrollments of underrepresented students” (p. 742). Financial circumstances, or inability to pay, should not limit a qualified student’s educational attainment.

As defined by Walpole (2003), the Bourdieuan concept of social capital refers to personal and professional gain that is leveraged through individual contacts and networks. Cultural capital encompasses the awareness or “insider knowledge” learned outside of school (Walpole, 2003, p. 49). Individuals may employ their cultural and social capital in order to attain economic profit (Bourdieu, 1977). Conversely, low-income students, possessing minimal amounts of social or cultural capital, have limited means to alter their social or economic position. Low-income students are more sensitive to tuition and aid (Walpole, 2003); a low-income level combined with little social capital compounds the problem. Lacking knowledge about college costs or the financial aid process, low-SES students espouse lower educational aspirations (Pascarella, Pierson, Wolniak, & Terenzini, 2004; Walpole, 2003). In short, if low-

income students cannot afford the cost of attendance, or face significant unmet need, then they do not enroll in higher education (Choy, 1999). Thus, social capital works to reproduce inequality (Bourdieu, 1977). Acknowledging the influence of social and cultural capital on college enrollment decisions, this study assessed the impact of need-based aid on low-income, minority undergraduate students.

The distribution of full-time dependent college students at two-year versus four-year institutions is demarcated by family income level (The College Board, 2009b). As family income increases, enrollment at two-year institutions decreases, while enrollment at four-year institutions increases. Steinberg and colleagues (2009) also found that the income and educational attainment levels of parents were related positively to students' enrollment decisions. Moreover, parental involvement, one form of social capital, predicts college enrollment (Walpole, 2003). Hence, the correlation between access and affordability warrants further exploration. Specifically, Gansemer-Topf and Schuh (2005) recommended exploring the question of whether or not "the influence of institutional grants on students from low-income families can be measured" (p. 18). Financial factors, such as Federal, state, or institutional aid, may bridge the income gap and make the choice of attending a four-year institution a reality for low-income students. The present study explored this notion.

Financial Factors

Financial aid serves as a tool to improve access for minority and low-income students, who are more sensitive to price (Doyle, Delaney, & Naughton, 2004). Current forms of financial aid include Federal student loans, grants such as the Federal Pell Grant or various Federal and state grants, and college prepaid plans that tend to benefit high-income students (Nora, 2001). Perna and Li (2006) recommended that institutional policymakers direct more financial aid

resources toward low- and lower-middle-income students, in an attempt to improve college affordability. St. John, Paulsen, and Carter (2005) contended that offering loans as the primary form of financial aid benefits Whites and furthers the disparity between Whites and racial/ethnic minorities in higher education. With the absence of grants or inadequate total aid, minority and low-income students often struggle with unmet need and price sensitivity. Nora (2001) recommended increased emphasis on grant aid at the Federal, state, and institutional levels in order to reduce low-income students' reliance on loans.

College tuition continues to increase at a time when Federal money is limited, and state taxpayers also are less inclined to support higher education (The College Board, 2009b). At the same time, the income gap has widened, and college is less affordable. Moreover, the cost of attendance varies by institutional type (Choy, 1999). The KnowHow2GO campaign website (2010) published the average college costs for the academic year 2006-2007, listing the average cost of a public two-year at \$2,361 and a public four-year at \$6,185. On average, students attending two-year public colleges receive enough grant aid to reduce their cost of attendance to around \$400, making two-year institutions overwhelmingly affordable in comparison to four-year colleges (KnowHow2GO, 2010). Consequently, low-income students are selecting cheaper options, such as two-year over four-year colleges and non-selective over selective institutions, resulting in further stratification by socioeconomic status in higher education (Institute for Higher Education Policy [IHEP], 2002; St. John, 2003). When low-income students are limited to cheaper, less selective institutions because of economic reasons, their lower social position is perpetuated (Walpole, 2003).

Educational attainment fosters social mobility and workforce gains for low-SES students. However, low-SES students are more likely to select less prestigious or less costly institutions,

such as two-year institutions (Corrigan, 2003; Walpole, 2003). Therefore, low-SES students have lower educational attainment and are still underrepresented at four-year and selective institutions, in particular (Walpole, 2003). The literature confirms that low-SES students are overrepresented at two-year institutions. Walpole (2003) explored how social class impacts low-SES college students and their subsequent educational attainment. Her study was based on the claim made by Bourdieu (1977), that cultural capital holds greater importance for persons of low-income level. The present study encourages readers to consider how the educational experiences of low-income students may contribute to their lower position in society.

Policymakers need to revisit the concepts of need-based grant aid and also low tuition practices to address the problem of affordability. Given the challenge of affordability, the problem addressed in this study was the disproportionately low enrollment by low-income, minority students at public master's-level institutions. At a time when the minority population in the U.S. is increasing, low (or disproportional) minority enrollment is observed in higher education, particularly at the four-year level. Traditionally, American society has subsidized higher education by way of loans, grants, and other forms of financial aid, primarily to ensure that the nation's labor force is sufficiently trained and prepared to contribute to the country's economy (Haveman & Smeeding, 2006). American society began to view higher education as more of an individual benefit in the 1980s, and financial aid has shifted from grants to loans ever since (Campaigne & Hossler, 1998). However, research indicates that minority students tend to be loan averse (Paulsen & St. John, 2002; St. John et al., 2005); therefore, another form of financial support is needed to cover the rising cost of attendance and provide qualified students with the opportunity to enroll (St. John, 2003). Public colleges and universities have the responsibility to develop alternate policies on tuition and financial aid, which address and

consequently improve the economic and racial diversity of their undergraduate student bodies (Steinberg et al., 2009).

Institutional Characteristics

In addition to income level, college enrollment patterns vary according to gender and race. Presently, female students pursue higher education at a higher rate than their male counterparts, and this gender gap continues to grow (American Council on Education, 2006). While total postsecondary enrollment has risen over the past 30 years, proportional representation in higher education with regard to race remains elusive. Minorities face various obstacles, including cultural differences, campus climate, financial aid, and exclusive recruitment strategies (Justiz, 1994; Lee, 1991). Justiz (1994) suggested that a lack of diversity, mentor programs, and intervention efforts may discourage racial/ethnic minorities from enrolling in higher education. Minority students who do pursue higher education tend to concentrate at community colleges because of cost. Higher tuition and fees of four-year institutions act as a deterrent, especially when minority students may prefer to reside at home and commute to a two-year institution (Astin, 1994).

Family loyalty often takes priority over social institutions among minorities, who tend to select colleges located closer to home (Lee, 1991). Carnegie Classification and campus setting appear to be correlated, at least for Master's – smaller programs, which tend to be located in rural environments. Only two urban and three suburban campuses are classified as Master's Colleges and Universities (smaller programs) within the 2005 Carnegie Basic Classification system (The Carnegie Foundation for the Advancement of Teaching, 2010b). The present study sought to gain further insight into unique enrollment patterns at public master's-level institutions

according to Carnegie Classification and campus setting (rural, urban, or suburban) (Kinhead, 2009).

Hispanic student representation in all postsecondary institutions is the lowest nationwide among ethnic groups (Gamboa & Vasquez, 2006). Moreover, Hispanic undergraduate enrollment is highest in private for-profit and public two-year institutions and lowest in private non-profit and public four-year institutions (St. John, Pineda, & Moronski, 2009). Higher education provides a path for social mobility for minorities and low-income students in particular. As degree attainment is improved for these individuals, both individual and societal benefits will result (Chen & DesJardins, 2008).

Hispanics constitute the largest minority community in the U.S., concentrated in West or South regions (Gamboa & Vasquez, 2006). Despite the fact that a postsecondary degree is a standard education goal that yields financial rewards through the labor market, the rate of Hispanic college degree attainment lags behind every other racial or ethnic group. Hispanics enroll in patterns that discourage degree attainment: enrolling in community colleges, enrolling part-time, or delaying enrollment until their late 20s (Fry, 2002). Hence, this study explored the effect of geographic region on low-income enrollment at public master's-level institutions as well.

Historically, the two main goals of U.S. public higher education have been “economic efficiency and social equity” (Haveman & Smeeding, 2006, p. 126). Moreover, an educated citizenry is a matter of public interest. Recent evidence suggests that 16 of the 30 fastest-growing careers require a bachelor's degree or higher (Bureau of Labor Statistics, 2009). Labor forecasters expect occupations requiring a postsecondary degree to account for almost half of all new jobs created between 2008 and 2018. Professional and service occupations are on the rise,

while production and manufacturing jobs are declining (Bureau of Labor Statistics, 2009). Katsinas and Friedel (2009) contended that master's-level institutions must continue to serve an access function if America is to reach President Obama's goal for this nation to achieve the highest percentage of citizens with postsecondary education in the world by 2020. Indeed, master's-level institutions may provide a solution to the access problem.

Purpose and Significance of the Study

The purpose of this study was to understand the influence of various financial factors and institutional characteristics on low-income undergraduate enrollment at public master's-level institutions. This study examined the number of low-income undergraduate students enrolled at public master's-level institutions in order to determine which institutions are serving this population well. In addition, reviewing the percentage of low-income undergraduate students enrolled at public master's-level institutions revealed a better picture of the undergraduate student body and allowed for more accurate comparisons across institutions of varying size. The first research question employed descriptive statistics in order to understand how the institutions may look different, with regard to undergraduate enrollment.

Institutional aid distribution at public colleges is less studied and less familiar than the same financial activity at private institutions (Doyle et al., 2004). Titus (2006) explored the effects of state aid on college completion, finding that need-based aid was an important factor in college attainment. Following the recommendation of Titus (2006) to examine the impact of need-based aid on a particular group of students, this study built on previous research to determine the extent to which need-based Federal, state, and institutional aid may explain low-income undergraduate enrollment at public Master's colleges and universities. This study is significant in that it expanded upon previous literature that has explored the "relationship

between the costs of college, student financial aid, and the postsecondary opportunities for racially diverse groups” (St. John et al., 2005, p. 546).

Family income and class status, both measures of cultural capital, contribute to college enrollment decisions (Perna & Titus, 2004). Students with comparable levels of social and cultural capital are expected to make similar decisions with regard to college (St. John et al., 2005). Unfortunately, low-income students often cannot afford the rising costs of higher education, nor do they possess enough social capital in order to navigate the process of receiving financial aid. While non-monetary factors do affect college choice, if students lack financial resources to afford higher education, they do not have the opportunity to attend.

Traditionally, Americans have engaged in a social contract, by which they agreed to pay for higher education for all, regardless of income level (Haveman & Smeeding, 2006). However, a philosophical conflict has emerged now that education is viewed more as a commodity in modern society. Attendees are expected to pay their own way in higher education because a degree ultimately will increase their earning power (Haveman & Smeeding, 2006). Even though individuals are poised to benefit economically by having a degree, America also benefits from having an educated citizenry (Gohn & Albin, 2006; Steinberg et al., 2009). If education is viewed not as a private good but rather as a public commodity, a national upfront investment is required.

With the declining purchasing power of Pell Grants and the subsequent increasing reliance on loans, college enrollment demographics are changing (St. John, 2003). Low-income students continue to struggle with the rising costs of higher education. Unfortunately, the rising cost of college furthers the social stratification between the haves and have-nots, since a college degree may enhance social capital (Perna & Titus, 2004; St. John et al., 2005). If a college

education is the key to the American dream, action must be taken to ensure access and affordability for all.

Nature of the Study

This first chapter has introduced readers to the problem of affordability in higher education as well as the adverse repercussions such a problem imparts on low-income and minority students. From an economic approach, where students view higher education as an investment, prospective students will consider the benefits of a four-year degree as well as the associated costs (McPherson & Schapiro, 1991; Perna & Titus, 2004). The net cost of higher education for students equals the total cost of attendance (tuition, required fees, and estimated expenses) less financial aid. Financial aid may be awarded at the Federal, state, or institutional levels, as well as through private sources, and these awards may be granted based on need or merit. In recent years, financial aid disbursements have shifted from need-based to merit-based (McPherson & Schapiro, 1998). Increasingly, financial aid is awarded based on merit rather than need, which negatively impacts low-income students (Doyle et al., 2009; Schmidt, 2009). As affordability continues to be problematic throughout higher education, institutional characteristics increasingly influence college enrollment decisions of low-income students.

Discerning the unique characteristics of public master's-level institutions, in terms of geographic location, Carnegie Classification, and campus setting, is essential. Thus, the following research questions were explored in this study:

1. In what ways do the following financial factors and institutional characteristics differ among public, residential Master's Colleges and Universities in the U.S., which serve primarily full-time undergraduate students, based upon the geographic region, 2005 Carnegie Basic Classification, and campus setting?

- a. Mean in-state total cost of attendance (COA) for on-campus undergraduate students
- b. Mean out-of-state total COA for on-campus undergraduate students
- c. Number (and percentage) of first-time, full-time, degree-seeking students receiving Pell Grants
- d. Mean amount of Pell Grant per student
- e. Total amount of aid awarded to first-time, full-time, degree-seeking undergraduate students in the form of Pell Grants
- f. Number (and percentage) of first-time, full-time, degree-seeking students receiving other Federal grant aid
- g. Mean amount of other Federal grant aid per student
- h. Total amount of aid awarded to first-time, full-time, degree-seeking undergraduate students in the form of other Federal grant aid
- i. Number (and percentage) of first-time, full-time, degree-seeking students receiving state and local aid
- j. Mean amount of state and local aid per student
- k. Total amount of aid awarded to first-time, full-time, degree-seeking undergraduate students in the form of state and local aid
- l. Number (and percentage) of first-time, full-time, degree-seeking students receiving institutional aid
- m. Mean amount of institutional aid per student
- n. Total amount of aid awarded to first-time, full-time, degree-seeking undergraduate students as institutional aid

- o. Number (and percentage) of first-time, full-time, degree-seeking students receiving need-based institutional aid
 - p. Mean amount of need-based institutional aid per student
 - q. Total amount of aid awarded to first-time, full-time, degree-seeking undergraduate students as need-based institutional aid
 - r. Number (and percentage) of first-time, full-time, degree-seeking students receiving non-need-based institutional aid
 - s. Mean amount of non-need-based institutional aid per student
 - t. Total amount of aid awarded to first-time, full-time, degree-seeking undergraduate students as non-need-based institutional aid
 - u. Total undergraduate enrollment
 - v. Percentage of undergraduate enrollment that is full-time
 - w. Percentage of undergraduate enrollment that is racial/ethnic minority
 - x. Percentage of undergraduate enrollment that is female
 - y. Total low-income undergraduate enrollment
 - z. Percentage of undergraduate enrollment that is low-income
2. To what degree does the combination of financial factors and institutional characteristics explain the number of low-income undergraduate students enrolled at public, residential Master's Colleges and Universities in the U.S., which serve primarily full-time undergraduate students?
3. To what degree does the combination of financial factors and institutional characteristics explain the percentage of low-income undergraduate students enrolled at public,

residential Master's Colleges and Universities in the U.S., which serve primarily full-time undergraduate students?

Appendix A provides a definition of unique terms referenced throughout this study.

Organization of the Study

In Chapter II, a review of the literature on this important topic is presented. A discussion of the benefits and costs of earning a bachelor's degree at public institutions follows, along with a discussion of the problem of affordability and the impact on low-income students and minorities. Then, the various forms of financial aid at the Federal, state, and institutional levels are reviewed. Next, an overview of low-income students and their unique characteristics is provided. A review of the access function of master's-level institutions and enrollment rates by income, race, and gender, then geographic region, Carnegie Classification, and campus setting follows. Astin (1993) contended that any educational evaluation or assessment that fails to include information regarding inputs, the environment, and outcomes is incomplete. Therefore, the present study addressed all three aspects, exploring how financial factors (cost of attendance, financial aid) and institutional characteristics (geographic location, Carnegie Classification, campus setting, percentage female undergraduate enrollment, and percentage ethnic/racial minority undergraduate enrollment) may explain the desired outcome (undergraduate enrollment by low-income students at public master's-level institutions). Incorporating all three components of the educational experience was expected to render a more accurate assessment of undergraduate enrollment behavior.

The present study sought to determine if the dependent variables (total number and percentage of low-income undergraduate enrollment) may be explained by any of the following independent variables based on undergraduate enrollment data reported for Fall 2007: mean total

cost of undergraduate attendance (in-state), mean total cost of undergraduate attendance (out-of-state), number of Pell Grant recipients, mean Pell Grant award, number of recipients of other Federal grant aid, mean amount of other Federal grant aid award, number of recipients of state aid, mean amount of state aid award, number of recipients of need-based institutional aid, mean amount of need-based institutional aid award, number of recipients of non-need-based institutional aid, mean amount of non-need-based institutional aid award, total undergraduate enrollment, percentage full-time undergraduate enrollment, percentage racial/ethnic minority undergraduate enrollment, percentage female undergraduate enrollment, geographic location (Midwest, Northeast, South, or West), Carnegie Classification (Master's Colleges and Universities- smaller, medium, or larger programs), and campus setting (rural, suburban, or urban).

Through a quantitative method, using a multiple linear regression model, the statistical data was analyzed in order to determine which, if any, of the independent variables have an explanatory relationship with the dependent variables – total number and percentage of low-income undergraduate enrollment at public master's-level institutions. Chapter III provides an overview of the methodology used in this study, and then results of the data analysis are presented in Chapter IV. Conclusions as well as recommendations for policymakers, practitioners, and future researchers are offered in the fifth and final chapter.

CHAPTER II:

LITERATURE REVIEW

Economic Approach to College Choice

Hossler and Gallagher (1987) discussed the process through which prospective college students move when making decisions regarding postsecondary education. The authors identified three stages that students encounter as they *decide* to pursue higher education (predisposition), *explore* colleges and universities that they are interested in attending (search), and *choose* where to apply and matriculate (choice). Hossler and Gallagher (1987) asserted that SES was significant at the Choice Stage and suggested that this stage warrants further research. SES was influential in that lower-income students were not as likely to apply to more selective, or high status, institutions. Institutional factors related to the Choice Stage included net price and financial aid (Hossler & Gallagher, 1987). Assuming that students take an economic approach to decision-making regarding college choice and enrollment, then students will weigh the costs and benefits and choose the best option available to them.

Following an economic approach, students view higher education as an investment. Informed by the extant literature, this study examined the benefits of a four-year degree as well as the costs of attending a four-year institution. Paulsen and St. John (1997) recognized that students chose to attend a particular college based on expectations of costs and benefits. Net price, or cost the student must bear, equals tuition less financial aid. Based on net price, four-year institutions are more costly than two-year colleges (IHEP, 2002; Perna, 2000; Perna & Li, 2006; Perna & Titus, 2004). Moreover, St. John (2005) contended that grant amounts remain

inadequate, particularly for low-income students. Paulsen and St. John (2002) found that students in public colleges responded more favorably to low tuition and were impacted negatively by inadequate grant amounts. According to their Financial Nexus Model, students will compare the associated costs and benefits of enrolling, based on certain expectations of financial aid. If this assessment leads a student to enroll in a college, then an “implicit contract” is established (Paulsen & St. John, 2002, p. 194). If the actual benefits diverge from what was expected with regard to college experiences, then the student may choose to un-enroll as a result. Subsequently, education is no longer a means of social mobility for that student.

Increasingly, college choice is related to income, evident by the fact that more students are attending two-year institutions overall (Perna & Li, 2006). In general, four-year college tuition exceeds financial aid awarded for low-income students, and rising tuition continues to represent a greater proportion of income for low-income families. As a result of this financial challenge, a growing gap has emerged in postsecondary opportunity with regard to family income and also race/ethnicity, particularly in the choice of four-year colleges (St. John, 2005). Tinto (2008) drew attention to and issued a call to action regarding the growing income stratification within higher education, particularly at four-year institutions. For the group of students matriculating in 1995-1996, six of every 10 (60%) of high-income students earned a bachelor’s degree, while just one of every four (25%) of low-income students reached four-year degree completion (Tinto, 2008).

Considering rising tuition and declining financial aid, higher education is facing a problem of affordability, which adversely affects low-income students the most. Along with the increasing net price of tuition, students are experiencing the declining value (purchasing power) of the Pell Grant and are left with significant unmet need (Doyle et al., 2004; St. John, 2003).

Thus, given the current income inequality, as well as declining savings for low-income families, the neediest students exhibit the least ability to pay for increasingly unaffordable higher education. Consequently, the opportunity structure promoted through educational attainment is subverted, and low-income students are denied this avenue of social mobility.

DesJardins (2001) asserted that ability to pay was influenced by gender, race/ethnicity, and income. Income level affects not only access but also the type of institution that students may choose to attend (Corrigan, 2003; Perna & Li, 2006). Indeed, different income groups experience distinctive aid elasticity (St. John, 2003). The rate of college enrollment increases with income, but probabilities of enrollment vary according to race/ethnicity within an income group (DesJardins et al., 2006).

Consequently, college choice remains stratified by income and race. Inequalities of social and cultural capital persist. Perna and her colleagues (2008) also took an economic approach to examining decision-making. “Perna’s model assumes that students make decisions about college enrollment based on an assessment of the costs and benefits of enrollment relative to their preferences, tastes, and uncertainty” (Perna et al., 2008, p. 246). Perna et al. (2008) incorporated measures of social and economic capital into their economic approach as a proxy for student preferences and tastes. Similarly, St. John and Paulsen (2001) also recommended including such measures to account for non-monetary factors and their effect on the college choice process. Social and cultural capital may serve as additional resources that individuals can convert into upward mobility.

Benefits of a Four-Year Degree

The fact that low-SES students are less likely to enroll in higher education, especially in four-year institutions, bears certain repercussions on their future economic and social status

attainment. Individuals possessing a college degree gain financial benefits through increased earning power and greater potential for wealth (Haveman & Smeeding, 2006). Individual benefits of higher education include higher earnings, higher standard of living, enhanced quality of life, more opportunities, increased competence, and superior cognitive, psychosocial, and moral development (Gohn & Albin, 2006; Steinberg et al., 2009).

Societal benefits of an educated citizenry include future generations who are more educated, resulting in reduced crime rates and unemployment (DesJardins et al., 2002; Steinberg et al., 2009). Additional societal benefits include less poverty, reduced incarceration rates, increased civic participation and volunteerism, and less dependence on public assistance programs or welfare (Gohn & Albin, 2006; Steinberg et al., 2009). Interestingly, the cost to educate a college student in a four-year, public institution is comparable to the expense of incarcerating a prisoner, approximately \$26,000 (Harlow, 2003).

College graduates who work full-time permanent jobs pay approximately 134% more in Federal taxes than high school graduates. Moreover, educated citizens have an increased propensity to vote. Rates of unemployment are lower among college graduates, when compared to high school graduates (The College Board, 2007). One paper recently published in the *American Sociological Review* concluded that those students who are least likely to pursue college stand to benefit the most economically from earning a degree (Glenn, 2010). The researchers found that the college wage premium was greatest for students from low-income groups entering college with little academic preparation or peer support. On average, these students, after completing college, earned 30% more than their peers who stopped their education after high school (Glenn, 2010).

From the freshman class that matriculated in the 1995-1996 academic year, only 26% of low-income students graduated with a bachelor's degree (Chen & DesJardins, 2008). Income-related gaps in access and enrollment according to institutional type have furthered the social stratification of U.S. higher education. Increasingly, college choices of low-income students are limited by financial constraints. Attendance has shifted to two-year institutions, as low-income students are less apt to attend four-year institutions than their high-income peers (Choy, 1999). Low-income students are more likely to work full-time while in college, and consequently, less likely than students from high-income families to attend full-time (Tinto, 2005). If these students need to work, part-time or full-time, in order to pay tuition, their likelihood of persisting is reduced greatly (Choy, 1999; Tinto, 2005).

Low-income high school graduates remain less likely than their high-income peers to enroll in higher education (Choy, 1999). "Even among the highest achieving high school students, low-income students are less likely to enroll, suggesting that finances may be a barrier for some," Choy (1999) concluded (p. 26). Satisfaction with the total cost of attendance suggests that the student believes the benefits of attending a particular institution outweigh the costs (Cabrera, Nora, & Castaneda, 1992; St. John, Paulsen, & Starkey, 1996). Because the literature identifies a variety of social and economic benefits to higher education attainment, action must be taken to ensure equality of educational opportunity. Higher education institutions may use grant aid to reduce the present educational inequality in America (Chen & DesJardins, 2008).

Finally, higher education access remains a necessary component in America's quest to remain competitive in the global economy. The U.S. has slipped in the international comparison of the percentage of 25- to 34-year-olds who have completed an education program at the postsecondary level. Now holding twelfth place, the U.S. is the only country in the first-world

where older citizens are more educated than their younger counterparts (NACAC, 2010). Except for the U.S. and Germany, the percentage of adults possessing a college degree has increased in all other countries (Haveman & Smeeding, 2006). In 2009, President Obama announced his goal for every American to complete at least one year of postsecondary education, with the hope of America becoming the world leader in college completion rates once more by 2020 (Field, 2009). The fact that the older population in America is more educated than the younger generation is disconcerting at best and does not bode well for the economic future of the U.S. in a global marketplace.

Costs of Higher Education

The cost of higher education is determined by the amount of tuition and financial aid (Heller, 2001; Perna & Li, 2006). The increasing cost of attendance has resulted from decreased state support and reduced Federal funding. The second element of cost, financial aid, has become problematic for low-income students due to the shift from need-based to non-need-based or merit aid, along with the decreased purchasing power of the Pell Grant (Doyle et al., 2004; McPherson & Schapiro, 1998; Perna & Li, 2006; St. John, 2003). The net price that students must pay for higher education equals the total cost of attendance amount less any financial aid awards. With rising tuition and diminishing financial aid, significant unmet need emerges for many students. Low-income students remain highly sensitive to tuition as well as inadequate financial aid. Institutions can control net price one of two ways: reduce costs and improve affordability as a result, or target need-based aid to needy students (Perna & Li, 2006). Given their higher aid elasticity, low-income students are more likely to benefit from financial aid that addresses unmet need (Chen & DesJardins, 2008).

Paulsen and St. John (2002) also found that rising tuition has a substantial negative effect on enrollment and persistence for low-income students. For each \$1,000 tuition differential, persistence among low-income students declined 16 to 19 percentage points (Paulsen & St. John, 2002). Many low-income students have remaining unmet need after financial aid is applied (Choy, 1999). Additionally, to keep up with rising costs, these students are working part-time or full-time, which deters persistence (Choy, 1999; Pascarella et al., 2004; Walpole, 2003). Since students are working more, they also are carrying fewer credit hours (Gohn & Albin, 2006). The fact that low-income students are forced to work while attending college in order to afford the rising costs of higher education is problematic. Walpole (2003) recommended that policymakers reevaluate current financial aid policies and take action to redirect aid to low- and middle-income students.

Moreover, Paulsen and St. John (2002) discovered that low-income, financially independent students struggle the most with meeting the net cost of tuition. St. John and colleagues (2005) found that Hispanic students respond uniquely to college costs, choosing lower-cost colleges and demonstrating greater loan aversion than other ethnic groups. Based on the Heller (1997) findings, the reaction to tuition and aid by Hispanics is mixed. Some studies find that Hispanics react to tuition and aid similarly to Blacks, while other studies yield a different result. Such a discrepancy warrants exploration.

Since the 1980s, college tuition has increased at a rapid rate, adversely affecting low-income students the most. Finances appear more important to undergraduates enrolled in public colleges, but Paulsen and St. John (1997) found that “financial aid in public colleges was generally insufficient” (p. 77). Paulsen and St. John (2002) explored the effect of rising college costs on choice and persistence among students at different income levels. In that study, Paulsen

and St. John (2002) examined how student choice varied across social classes and how financial factors influenced choice among these groups. The authors accentuated that “class plays an important role in education and attainment and should be considered when critically examining educational policy” (Paulsen & St. John, 2002, p. 195). Social class, along with one’s cultural capital and habitus, influences a student’s cost-consciousness and impacts his or her college choice. Cost-related factors played a major role in college choice and enrollment for low-income students in that study, reinforcing previous research regarding social stratification within educational attainment (Paulsen & St. John, 2002).

A recent report, *The Rising Price of Inequality*, by the Advisory Committee on Student Financial Assistance (2010), used National Center for Education Statistics (NCES) data to inspect the college-going rates of low- to moderate-income students who met the academic qualifications to enroll in a four-year institution. Report findings revealed that the net cost of attending a public institution represented an increasing share of income for this population. The report also verified an enrollment shift away from four-year colleges among low-income students. In 1992, 54% of low-income students graduated from a four-year institution; by 2004, that percentage had dropped to 40 (Supiano, 2010a).

The Problem of Affordability

Affordability is determined by the college’s net price and the student’s ability to pay (Perna & Li, 2006). Net price includes rising college tuition and fees, declining value (purchasing power) of the Pell Grant, substantial unmet need, increased borrowing/ reliance on loans, and increasing merit aid, tax credits, and tax deductions that favor middle-class and wealthy students (Perna & Li, 2006). Ability to pay is determined by income inequality, declining health benefits, increasing debt, and declining savings (Perna & Li, 2006). Increasing

net price, combined with the declining value of the Pell Grant, results in unmet need for low-income students. Consequently, net price affects the student's ability to pay.

Family income level dictates both access and the type of institution where a student may choose to enroll (Perna & Li, 2006). Thus, income inequality makes affordability problematic. Tuition charges are significant and negatively associated with student decisions to enroll (St. John, 1990, p. 168). Non-need based aid contributes to the problem of affordability for low-income students. Additionally, low-income students are less likely to have the necessary academic preparation for college (Pryor et al., 2007), and consequently they are less likely to receive merit aid (Perna & Titus, 2004). The fact that this population often is less qualified for merit aid is problematic for college affordability because financial aid has shifted from need-based to merit-based awards since 1995 (Duggan & Mathews, 2005; McPherson & Schapiro, 1998).

Recent tuition increases, along with simultaneous growth in enrollment, have contradicted economic price-response research, which would predict enrollment to decline as tuition rises (Becker, 1962; McPherson & Schapiro, 1998; Shin & Milton, 2006; St. John, 2003). A logical explanation to this observed outcome is that price-sensitive students have chosen to enroll in different (i.e., - lower cost) institutions to counteract increased tuition but still achieve the benefits of a college degree. Increased financial aid may ensure affordability for low-income students, in spite of higher tuition levels.

The most effective programs target financial aid to low-income students and students with limited financial resources at the Federal, state, or institutional level (Perna & Li, 2006). St. John (2003; 2005) reiterated that institutional policies shape enrollment behavior. Therefore, Perna and Li (2006) recommended that institutions maximize the availability of need-based

grants to address the problem of affordability. Additionally, St. John et al. (2005) argued for the “need to reexamine arguments for need-based grant aid” (p. 565). Historically, low-income students have been more responsive to grant aid increases than their middle- or upper-income peers (Leslie & Brinkman, 1988; St. John, 1990).

Nora (2001) recommended the implementation of targeted financial aid programs to address affordability for those students whose aid is not met, particularly minority students. St. John (2003) also contended that institutional policies, including both financial and academic support, influence student outcomes. Similarly, Steinberg et al. (2009) attributed the dormant proportion of American youth earning a bachelor’s degree to changing financial aid trends. The authors also found that the amount of institutional aid had a significant and positive correlation with increased enrollment by Pell Grant recipients (Steinberg et al., 2009).

Since the 1990s, grant aid has been awarded increasingly based on factors other than need. The use of educational loans as financial aid also has increased during this time period (St. John, 2003). At the same time, the gaps in college affordability and degree attainment by family income level have grown. Current levels of Federal and state aid are inadequate to promote first-time enrollment in the majority of four-year institutions (St. John, 2000). These trends raise concern about the access and affordability of higher education.

Indeed, if education is a right, America must renew its commitment to affordability to guarantee that no student is denied access due to ability to pay (Chen & DesJardins, 2008). Likewise, Tinto (2005) argued that we “will not close the achievement gap unless institutions take it upon themselves to address the needs of low-income students” (p. 4). Given that society stands to benefit from an educated citizenry, American higher education institutions must return

to the use of need-based grants to subsidize tuition at four-year colleges and universities for low-income and minority students (Nora, 2001).

Effects of Financial Aid

With the rising cost of college attendance and slow growth of family income, an increasing number of students are relying on financial aid for access to higher education. Hossler (2000) noted that financial aid was established in order to remove access barriers for low- and middle-income students. Pascarella and Terenzini (2005) asserted that financial aid may have both positive and negative effects on persistence and degree attainment. Loans have a negative effect on persistence for all students except Whites, while grants alone result in higher levels of persistence (Fenske, Porter, & DuBrock, 2000; St. John et al., 2005). Taken as a whole, access to higher education steadily increased throughout the 1990s; nevertheless, “the opportunity for poor and working-class students to attend public four-year colleges declined” during that decade (St. John, 2003, p. 136). Affordability of postsecondary education remains troublesome, and the high-loan approach currently being implemented does not remedy this problem sufficiently for low-income families (St. John, 2003). The present study reiterates the negative correlation between aid and enrollment, particularly when aid is insufficient (Paulsen & St. John, 2002; St. John et al., 2005).

First-generation students beginning at four-year institutions are at great risk of dropping out of college if not met with various levels of support, including financial assistance (Ashburn, 2009). Schmidt (2010) ascertained that being first-generation is a reasonable indicator of a working class, or low-income, background. First-generation students face a particular disadvantage with regard to costs and also knowledge of the financial aid application process in postsecondary education (Pascarella et al., 2004). Although they may experience the benefit of

greater personal growth from attending a selective higher education institution, first-generation students are less likely than their peers to enroll in a selective college (Corrigan, 2003). These students, often lacking financial resources, have a demonstrated need for sufficient financial aid. Social capital, born in relationships, facilitates the transmission of resources (Pascarella et al., 2004). While first-generation students may not arrive at college with much social capital, certainly they will acquire cultural and social capital while pursuing higher education, which they may employ to advance their social position upon graduation.

One study presented at the 2009 ASHE Conference revealed that financial aid positively affected the grades of first-year low-income students, in particular, at the University of Oregon (Schmidt, 2009). Each \$1,000 in aid resulted in a 0.06-point increase in the average freshman GPA but raised the GPA of low-income students by 0.1 per \$1,000. A similar effect was noticed for minority students, though the population within the sample was small. The researchers summarized, “The effects of financial aid appear to be strongest when given to more vulnerable populations” (Schmidt, 2009, ¶ 9). Financial aid may facilitate academic success and persistence in addition to increasing affordability of higher education.

St. John and others have employed a student-choice construct that allows researchers to examine the unique experiences of diverse student groups. Paulsen and St. John (2002) acknowledged “a sequence in educational choices with explicit policy linkages” (p. 192). Recognizing this sequence of choices, and the fact that students make these choices about college in a “situated” context (p. 192), Paulsen and St. John (2002) examined and compared students at distinct socioeconomic levels to determine the impact of finances on college enrollment. A majority of low-income students make college decisions based on a low cost of attendance and adequate amounts of financial aid (Paulsen & St. John, 2002). Student

expectations of low tuition and high aid, and corresponding college choices that result, facilitate the “reproduction of social class” stratification within the higher education system (Paulsen & St. John, 2002, p. 220). As long as low-income students consider the financial factors of college attendance through the lens of their present circumstance, social class stratification in higher education will continue.

Kim et al. (2009) also considered student expectations for financial aid versus the actual amount of aid awarded to understand how the college choice process is affected by the difference. The effect was significant for minority students. African American and Hispanic students chose to enroll at a lesser rate when they did not receive the expected amount of financial aid (Kim et al., 2009).

Federal Aid

The College Board estimated that in 2003-2004, financial aid disbursements exceeded \$122 billion (Haveman & Smeeding, 2006). Nearly half of that total was comprised of Federally-backed loans. Student loan volume grew a staggering 282% in constant U.S. dollars from 1990 to 2007 (ACE, 2008). At the same time, 41% of the students graduating with a degree or certificate in 2007-2008 exited with zero debt. Specifically at the bachelor’s degree level, only 34% of graduates completed college with no debt (The College Board, 2009b). Ten percent of graduates from four-year public institutions graduated with loans in excess of \$40,000. The median debt for borrowers graduating from public four-year colleges in 2007-2008 was \$17,700, including both Federal and private loans. Clearly, the Federal government has shifted its financial support from grants to loans (Paulsen & St. John, 2002).

The new income-based repayment program for Federal student loans took effect July 1, 2009 (Jacobs & Hyman, 2009). Recognizing the economic hardship that educational loans have

placed on individuals after college, the Federal government enacted a law that limits required loan payments to no more than 15% of the borrower's income. Moreover, any debt remaining after 25 years shall be forgiven (Jacobs & Hyman, 2009; The College Board, 2009b). While such reform is progress, this law is not an affordability solution for those ethnic groups who are loan averse. Hispanic students, especially those of Mexican descent, were less likely to borrow than White or Black students in 2003-2004 (IHEP, 2008). The only racial group more loan averse than Hispanic was Asian (IHEP, 2008).

Only 30% of Hispanic students took out loans in 2003-2004, compared to 35% of all undergraduates. Intriguingly, Hispanics attending private, for-profit colleges were more likely to borrow than those enrolled in four-year public institutions (IHEP, 2008). Hispanic students, in particular, resisted loans for fear that they would be unable to repay the debt if they did not reach degree attainment. Acting from the pay-as-you-go perspective, Hispanic students without sufficient financial need make college enrollment decisions based on their present economic position. Consequently, nearly half of Hispanic students select less expensive community colleges, and about the same amount choose to attend part-time (IHEP, 2008). However, Titus (2006) found that unmet financial need negatively impacted degree completion, as did the number of hours worked. Thus, students who work to keep up with rising costs of college are less likely to reach degree attainment.

Additional Federal support, including Pell Grants and Federal work-study, constituted 20% of financial aid disbursed in 2003-2004 (Haveman & Smeeding, 2006). The remaining 30% came in the form of state or institutional aid. However, while financial aid has grown in sum total, the amount aimed at assisting low-income students has decreased as merit-based aid has begun to take the place of need-based support (Haveman & Smeeding, 2006). Moreover,

Federal grant aid, specifically the Pell Grant, is somewhat ineffective at providing access for low-income students due to the cumbersome application process, including the Free Application for Federal Student Aid (FAFSA), which deters some applicants (Lederman, 2009).

In 1986, the U.S. Congress established the Advisory Committee on Student Financial Assistance, charging its members with the responsibility of monitoring access and persistence rates of low- and moderate-income students. The advisory committee assessed all forms of grant aid, including Federal, state, and institutional financial support (Advisory Committee on Student Financial Assistance, 2010). The committee's work on enrollment at four-year colleges remains important because the premise of America's financial aid system is that all youth, regardless of income level, should be able to pursue and attain a bachelor's degree if they have the desire and academic preparation.

State Aid

Financial aid managed to keep up with the rising tuition in the 1990s, thereby controlling, if not reducing, the net price of college for low-income students. However, declining state support since 2000 does not bode well for college affordability for low-income students (Haveman & Smeeding, 2006). Titus (2006) found that a state's expenditures for need-based grant aid were correlated positively to the graduation rates of four-year institutions. Therefore, as state aid decreases, degree completion rates decline as well. Perna and Titus (2004) found that the level of state need-based aid was related to the institutional type selected by high school graduates. Moreover, larger amounts of state need-based financial aid were found to be associated with a greater chance of enrolling in a public four-year institution within the state, as compared to not enrolling (Perna & Titus, 2004).

The American Council on Education (2009) indicated the total amount of state aid as well as aid percentages by category: need-based grant, non-need-based grant, and non-grant aid for the 2007-2008 academic year. Some states maintained high need-based grant levels (85% or higher), such as California, Illinois, Iowa, Maine, Maryland, Montana, New Hampshire, New York, Pennsylvania, Rhode Island, Vermont, Washington, Wisconsin, and Wyoming. A significant number of states have designated less than 25% of their aid for need-based grants: Alaska, Georgia, Florida, Hawaii, Louisiana, Mississippi, Nebraska, South Carolina, South Dakota, and Utah (ACE, 2009). Four states known for lottery-based scholarships provide the majority of their aid in the form of non-need-based grants: Florida (60%), Georgia (97%), South Carolina (81%), and Tennessee (73%). Merit-based grants are awarded for academic achievement, which is correlated positively with family income (Perna & Titus, 2004). Therefore, merit-based state aid benefits high-income students the most and does little to ensure access and affordability for low-income, minority students (National Association of State Student Grant and Aid Programs, 2005). Unfortunately for low-income students, state support in the form of merit-based aid has grown at a faster rate than need-based financial aid programs since the mid-1990s (Perna & Titus, 2004).

In light of the economic crisis that started late in 2008, many state budgets were slashed, leaving even less funding for higher education. Notably, Ohio, Illinois, Indiana, Michigan, and Wisconsin experienced severe budget cuts, which have diminished not only the amount of grant aid available to students but also the financial support provided directly to the public institutions in each state (Foley, 2009; McCutcheon, 2009; Newbart, 2009; Okoben, 2009). Consequently, colleges and universities drastically increased tuition to subsidize their operating budgets.

However, the result of these changes adversely affected students, who were left scrambling to finance the higher tuition with less state aid.

Other Federal Grant Aid

While state aid has diminished and tuition is on the rise, a glimmer of hope came in the form of additional Federal grant aid as of July 2010 (Clark, 2010). Effective in the 2010 fiscal year, Pell Grants were increased from \$5,350 in 2009-2010 to \$5,550. The average amount in 2010-2011 was projected to be \$3,865 (Clark, 2010). Even though the Pell Grant maximum was increased by \$200, more four-year colleges raised tuition \$400 to \$800 in the same year, so many low-income students still faced an economic hardship. The Federal government will continue to award Academic Competitiveness Grants and SMART Grants for students in math, science, or other high-demand fields (Clark, 2010). According to the current National Association of Student Financial Aid Administrators' President, Justin Draeger, a number of institutions in Michigan, Georgia, New Mexico, and Kentucky are maintaining or expanding their financial aid budgets and creating new scholarships to bridge the financial gap (Clark, 2010).

St. John (2003) recommended more accurate grant aid distribution, using economic theory to argue for the importance of access in higher education. Taken as a whole, access in higher education steadily increased throughout the 1990s; nevertheless, "the opportunity for poor and working-class students to attend public four-year colleges declined" during that decade (St. John, 2003, p. 136). DesJardins (2001) acknowledged that financial aid exerts the greatest influence on the enrollment stage of the college choice process. Using economic theory and student price response research, DesJardins (2001) tested how institutional aid affects enrollment; he found that enrollment yields improved as grant amounts increased. Various types of financial aid impact different students in unique ways. Kim et al. (2009) observed statistically

significant differences in the influence of grants, work study, and outside aid on college application according to income level.

Institutional Aid

As Federal and state aid have plummeted, college students and their families have turned to universities to supplement the rising cost of attendance. Unfortunately, Hillman (2009) determined that institutional aid distribution at public colleges was influenced neither by Federal and state need-based aid programs nor the proportion of low-income students. Moreover, the Advisory Committee on Student Financial Assistance (2006) predicted that over the next decade, approximately 1.4 million lower-income, capable, high school graduates would relinquish postsecondary education entirely because of financial reasons.

In light of this overwhelming evidence, the Advisory Committee on Student Financial Assistance (2010) concluded that the present amount of grant aid is insufficient to ensure access of low- and moderate-income students. The committee recommended limiting tuition increases as well as offsetting the rising cost with need-based aid (Advisory Committee on Student Financial Assistance, 2010). Any national strategy to increase the bachelor's degree attainment of low-income or moderate-income high school graduates must address the financial barriers to college enrollment.

In the 2009-2010 academic year, a majority of financial aid offices observed an increase in financial aid applications by 10% or more. Moreover, these offices reported a higher number of students with remaining financial need after state and Federal aid had been applied (Supiano, 2009). Paulsen and St. John (2002) asserted that institutions could be more effective at identifying financially at-risk students. As Choy (2004) summarized in the NCEs special

analysis, *Paying for College*, “grant aid reduces the price of attending because it does not have to be repaid” (p. 34).

In response, many colleges have attempted to make up the gaps in aid with institutional funds. Institutional aid includes all financial aid distributed to students by their individual institutions independent of Federal or state aid (Doyle et al., 2009). In the Midwest, where state funding for higher education has been cut drastically due to the economic downturn, some institutions in Indiana, Illinois, and Ohio struggled to find new funding sources for their students at the last minute. Most of the private institutions were able to replace the state grants with institutional aid, but the public colleges and universities increased the loan amounts in students’ aid packages to compensate for the last-minute state cuts (Supiano, 2009).

Institutional aid as an enrollment management strategy at public colleges emerged in the 1970s (Sidar & Potter, 1978). Institutions use internal financial resources to award aid to undergraduate students, in accordance with specific policy goals: promoting access, attracting more competitive students, or growing enrollment (Wirt et al., 2004). Institutional aid is comprised of grants primarily, but also includes work-study, assistantships, and fellowships (Wirt et al., 2004). However, while need-based grants made up the majority of institutional aid in the beginning, non-need-based awards have taken precedence in recent years and now comprise nearly 60% of total institutional aid awarded (The College Board, 2006). This shift in aid strategy benefits upper-income students at the expense of low-income students (Wirt et al., 2004). When awarded based on need, financial aid appears to equalize educational opportunities for students across income levels (Cabrera et al., 1992). Moreover, when sufficient financial aid is applied, low-income students have persisted at the same rate as their more affluent peers (Leslie & Brinkman, 1988; St. John, 1990).

Tuition discounting is the term for institutional grant aid that lowers the sticker price and does not require repayment (The College Board, 2006). Institutional aid exists as a discretionary budget item, and administrators retain the authority to decide *how much* aid will be awarded as well as *who* will receive it. In an era of increasing competitiveness for prestige among higher education institutions, many colleges are tempted to award non-need-based aid to attract meritorious students, rather than to distribute need-based grants in an attempt to address the affordability concerns by low-income students (Hillman, 2009). Market forces overcome societal objectives, and public colleges have directed an inordinate amount of institutional aid toward students who do not present financial need (Hillman, 2009).

Private colleges utilize extra funds acquired from budget reallocations to enhance institutional aid awards for students (NAICU, 2010). Public institutions may draw upon several sources to fund institutional aid, including gifts to the annual fund, endowment revenue, or general revenue realized by the college, primarily through tuition (The College Board, 2006). Institutional grant aid at four-year public colleges has grown through the years, from 16% of full-time undergraduates in 1992-1993, to 23% in 1999-2000, and rising again up to 28% in 2003-2004. The discount rate (net price) among public institutions appears to have peaked in 2002-2003 (The College Board, 2006).

Institutional aid now constitutes the second largest source of grant aid for college students (Price & Davis, 2006). Between the 1994-1995 and 2004-2005 academic years, institutional aid awards rose from nearly \$10.3 billion to more than \$24 billion (Price & Davis, 2006). Public institutions disbursed a total of \$7.8 billion in fellowships and scholarships during the 2000-2001 academic year (Doyle et al., 2009). For the 1995-1996 academic year, Price and Davis (2006) found that the average need-based institutional grant disseminated at four-year

public institutions equaled approximately 28% of tuition and fees; less than one quarter of the need-based institutional grants at four-year public institutions satisfied at least half of recipients' tuition and fee expenses. However, most low-income students do not necessarily possess the resources to cover such a vast difference in cost of attendance. Price and Davis (2006) recommended that researchers and policymakers “develop more definitive evidence on the impact of institutional grant aid” (p. 5).

Merit aid recipients oftentimes have the ability to pay but are not willing to pay the full price of attending certain colleges, such as out-of-state institutions, which have a higher cost of attendance for nonresidents. The Expected Family Contribution (EFC) does not consider the total cost of attendance at the institution selected by the student, only the family income level (Choy, 2000). Therefore, if a student chooses to attend a more expensive institution, the student's COA budget will increase, which inadvertently causes the student to appear financially needy when he is not low-income (Choy, 2000). However, McPherson and Schapiro (1998) argued that “no obvious purpose of equity is served by adding to their advantage through a reduced price for college” (p. 111). If America's financial aid system is intended to level the playing field by removing financial barriers of attendance, then merit aid falls short of what need-based aid may accomplish (The College Board, 2006).

The College Board (2006) conducted a study of tuition discounting at a variety of institutional types, using its *Annual Survey of Colleges* [ASC]. That report adhered to the Common Data Set and defined need-based aid as any aid that meets the financial need of students. One College Board (2006) finding of particular interest is that four-year public institutions spent less than half of their institutional aid funds in order to meet their students' financial need. However, flagship institutions awarded more aid based on need than did other

four-year public colleges. In 2003-2004, public flagship institutions awarded 43.9% of their institutional aid in need-based grants, while only 36.8% of institutional aid awards at other four-year public colleges were classified as need-based (The College Board, 2006).

Regardless, the fact that need-based aid comprises less than half of financial aid budgets at all four-year colleges is troubling, since institutions appear to be using grants to build a class of high-achieving students and athletes, instead of increasing access for needy students. On average, when considering the increases in grant aid and tuition between 2000-2001 and 2003-2004, total grant aid (Federal, state, and institutional) covered only 57% of tuition increases. The discount rate was correlated with the proportion of out-of-state students, while the percentage of need-based institutional aid was not (The College Board, 2006). The only conclusion is that the four-year public institutions in that study were using out-of-state tuition revenue to fund institutional aid. These results support St. John's (2000) assertion that public institutions have yet to make an adequate investment in institutional aid, in light of tuition increases.

One exception is the University of Florida, where in 2006, President Machen noticed that a significant proportion of admitted low-income students were not enrolling. He charged the Vice President for Student Affairs to address this problem with a new scholarship program (L. Pendleton, personal communication, August 13, 2010). In 2006, the University of Florida implemented a new scholarship program for low-income, first-generation students (Supiano, 2010b). The Vice President for Student Affairs helped to launch the new program, Florida Opportunity Scholars. This access program was created in response to the fact that the median family income of enrolled students had escalated to \$100,000 while the number of low-income students had declined (University of Florida, 2010a; University of Florida, 2010b). After four years, the director of Florida Opportunity Scholars has observed an increase in enrollment yield

and also increased retention by this population (L. Pendleton, personal communication, August 13, 2010).

Beginning with the 2010-2011 academic year, the University of Texas will gradually eliminate its National Merit Scholarship program and transition funds into need-based scholarships (Benning, 2009). The state's largest university made this decision after receiving increased financial aid applications from its students. This action "could signal a renewed emphasis on need-based aid" for higher education (Benning, 2009, ¶ 3). The UT financial aid director said, "We have to make sure that UT-Austin is financially accessible to all qualified students" (Benning, 2009, ¶ 7).

Institutional aid has gained significance over the past few decades, at a time when the purchasing power of the Pell Grant has dropped, and state aid has shifted toward non-need-based programs (Doyle et al., 2009). However, little research exists on institutional aid programs at public colleges and universities (Advisory Committee on Student Financial Assistance, 2001; Doyle et al., 2009). Evidence suggests that institutions are directing more aid toward merit recipients, rather than those students who demonstrate need (Doyle et al., 2009; Price & Davis, 2006).

Paulsen and St. John (2002) found that low-income students react adversely to inadequate grant amounts. Indeed, insufficient amounts of financial aid have proven to be barriers for degree completion. With this supposition in mind, Hillman (2009) embarked on a study examining how institutions were distributing need-based and non-need-based institutional aid, analyzing the financial aid expenses of over 200 four-year public institutions. Findings revealed that colleges were hindering Federal and state efforts to increase access by awarding increasing levels of institutional aid based on merit, instead of need (Hillman, 2009; Schmidt, 2009).

Hillman (2009) concluded that market forces were redirecting institutional aid to out-of-state students and students with high standardized test scores, rather than awarding aid to students who demonstrated financial need. Similarly, the study determined that state merit aid programs discouraged institutional need-based aid (Hillman, 2009). If America were to revisit a social justice perspective and renew her commitment to higher education, would the enrollment of low-income students be increased by institutional need-based aid at four-year public colleges?

St. John and colleagues (2005) examined how financial aid and the total cost of attendance affect educational access and attainment for diverse groups. They argued the importance of exploring the distinct patterns of college choice among different racial groups. Perna and Titus (2004) found that institutional financial aid promoted student choice. They also found that additional state need-based aid is associated with increased enrollment at an in-state public four-year institution, as compared to not enrolling. The present study sought to determine if additional institutional need-based aid would have a similar result. Institutional aid may level the playing field for all students.

As demonstrated by Perna et al. (2008), the lack of consistency within financial aid programs is problematic. Institutional policymakers are wise to consider approaches that have philosophical coherence, systematic policy development, and clear program goals (Perna et al., 2008). Enrollment managers should remain aware of their institution's interaction with state and Federal aid programs, so that grants are applied where needed most and also in accordance with the institutional mission. When multiple aid programs work together, they are increasingly effective at influencing enrollment for particular groups of students.

Net increases in the cost of attendance negatively impact enrollment by low-income students (Heller, 1997; McPherson & Schapiro, 1991; St. John, 1990). Gansemer-Topf and

Schuh (2005) posited that “low-income students increasingly will rely on institutional grants to pay for college expenses” (p. 17). Therefore, employing institutional grant aid without regard to need, in an attempt to craft a more academically competitive class, may compromise efforts to enroll low-income students (Ehernberg, Zhang, & Levin, 2006). Such a result is problematic for public institutions, whose missions are focused on educating citizens at all socioeconomic levels. If policy adjustments are not made, present inequalities in student distribution by income level throughout higher education will persist and most likely worsen over time.

Tinto, in *Economic Inequality*, argued that “access without support does not ensure equality of opportunity” (Haveman & Smeeding, 2006, p. 140). The current higher education scheme in the U.S. must be overhauled if social justice remains a goal. American higher education provides a path for economic and social mobility, so Federal, state, and institutional stakeholders must work to level the playing field for all. Perna and Titus (2004) recommended an analysis of private institutions’ distribution of need-based institutional aid resources to recruit low-SES students. This recommendation may be applied to four-year public institutions as well to determine their effectiveness in attracting and enrolling low-income students.

Profile of Low-Income Students

The profile of low-income students differs greatly from that of their higher-income peers. Low-income students have an increased likelihood of being female, an ethnic or racial minority, and responsible for supporting dependents (Choy, 2000; Corrigan, 2003). Specifically, 43% of Black students were found by Choy (2000) to be low-income, along with 40% of Hispanic students. Each of these familial and economic circumstances impacts the enrollment decisions of low-income students in unique ways. Low-income risk factors include family background and

institutional choice (Corrigan, 2003). Additionally, the academic background of low-income students and their parents affects their attitudes toward college (Corrigan, 2003).

Low-income students, especially first-generation students, possess less knowledge about higher education and also have fewer resources for social, financial, and academic support (Corrigan, 2003). As a result, low-income students are less likely to attend four-year institutions, either public or private, when compared to their middle- and upper-income peers (Corrigan, 2003). Moreover, low-income students are more likely to attend part-time or to delay college enrollment (Choy, 2000). Interpreting the data on unmet need, Choy (2000) concluded that low-income students indeed cannot afford to be enrolled at four-year public institutions, given the drastic increases in cost of attendance.

Socioeconomic status is an NCES/ NELS term that incorporates parents' educational attainment, family income, parents' occupational status, and the number of particular items in the household (newspaper, computer, books, or atlas). Perna and Titus (2004) contended that SES is a more accurate gauge than family income level. While low socioeconomic status does not always translate into low-income, a distinct relationship is recognized among the following: SES quartile, income level, and educational attainment (Rowan-Kenyon, 2007). However, Paulsen and St. John (2002) argued that SES, taken alone, is not complex enough to address the full concept of social class. Measures of social class, such as SES, reflect a person's cultural capital and habitus (Paulsen & St. John, 2002; Perna & Titus, 2004).

Socioeconomic factors, including income level, influence the decision to pursue a college degree (St. John et al., 1996). Once students decide to pursue college, the estimated costs and benefits, coupled with their ability to pay, influence their college choice (St. John, Cabrera, Nora, & Asker, 2000). Lower-income students, and minorities, remain overrepresented at the

community college level (Heller, 1997). St. John et al. (2005) posited that the college choices of lower-SES students generally are limited by their financial means, reinforcing prior research that indicated social class affects college-going more than race or ethnicity.

Perna and Titus (2004) found that the enrollment patterns of the 1992 high school graduates varied by SES. In that study, a considerably smaller percentage of low-SES high school graduates (15%) enrolled in in-state four-year public institutions than did their high-income peers (35%). Moreover, those high school graduates in the lowest SES quartile were found to be less likely to enroll in either an in-state four-year public or any out-of-state institution than to matriculate at an in-state public two-year institution (Perna & Titus, 2004). Interestingly, low-SES students were almost equally likely to enroll at in-state private institutions as they were to enroll in a less-costly in-state public two-year institution, perhaps an indication that private colleges are using institutional aid more effectively than public universities.

The Institute for Higher Education Policy (IHEP) 2002 report presented a continuum for understanding college choice in a policy context. Multiple definitions of choice exist in the public policy perspective, and IHEP (2002) posited that Federal financial aid policy exists to neutralize the financial factors on college choice. The Financial Aid Choice Policy Continuum ranges from the ability to attend an institution that costs more than the least expensive one, to the opportunity to attend any institution, even the most costly (IHEP, 2002). Within the Financial Aid Choice Policy Continuum, choice between two-year and four-year institutions is implied, and “financial aid would be expected to somewhat equalize the distribution of students from different income backgrounds by institutional type” (IHEP, 2002, p. 7). However, the literature on higher education enrollment reveals that equal distribution of students from various income

levels is not a reality. Low-income students are concentrated at low-cost institutions and two-year colleges in particular (Corrigan, 2003; Paulsen & St. John, 2002; Tinto, 2008).

Institutional Enrollment Rates

The research on institutional enrollment rates indicates that cost of attendance in relation to available student financial aid substantially influences whether students can enroll and where (Advisory Committee on Student Financial Assistance, 2002; Heller, 1997). A pattern of inequality emerges when enrollment patterns of public four-year and two-year colleges are dissected by income group (St. John et al., 2009). St. John and colleagues (2009) asserted, “When need-based student financial aid is constrained to a level below the need of the poorest of society, then they will not be able to pay for more costly public colleges (i.e., public four-year colleges)” (p. 23).

Income, Race, and Gender

St. John (1990) found that “tuition charges are significant and negatively associated with student decisions to enroll” (p. 168). In addition, Cabrera and colleagues (1992) found that inadequate aid amounts may inhibit low-income students’ social and academic integration, two factors that are directly related to persistence. Pascarella et al. (2004) contended that access to higher education must incorporate access to the broad “range of college experiences and to the personal, social, and economic benefits to which those experiences and degree completion lead” (p. 281).

Rowan-Kenyon (2007) assessed the rate of college enrollment for low-income, low-socioeconomic students at different points: immediately after high school graduation, delayed one or two years, or not at all (within the eight years of her study). Income level and SES impacted the rate of enrollment, while race, gender, and SES significantly affected the timing of

enrollment. Rowan-Kenyon (2007) also found that enrollment increased in accordance with socioeconomic status. St. John (2003) explained that “students respond to prices and subsidies based on their situated circumstances” (p. 187). Tuition increases combined with decreased aid affect the college enrollment decisions of low-income students to a greater degree than their higher-income peers (Heller, 1997). Certainly, the cost of attendance, after grant aid, represents a significantly higher proportion of family income for low-income, dependent undergraduates, as compared to their higher-income peers (Perna & Li, 2006).

Choy (1999) posited that the rate of college enrollment rises with increasing levels of family income. However, family incomes have not increased at the same rate as the cost of college attendance. For low-income students, the amount of unmet need continues to demand a substantial percentage of family income, and consequently, these students are the least likely to attend college (Choy, 1999). Indeed, college affordability depends on both the net price and also the student’s ability to pay (Perna & Li, 2006). The 2002 IHEP Report highlighted the trend of students moving to lower-priced colleges, particularly community colleges. Low-SES students demonstrate lower aspirations and educational attainment and are underrepresented in higher education (Walpole, 2003). They exhibit distinct college choice processes and tend to choose less selective institutions when they do enroll, which perpetuates their lower social position. Low-SES students require a college degree for social mobility and also workforce gains. Being low-income plus having less social capital perpetuates the problems of affordability and access.

Total enrollment in higher education has increased since 1980, and enrollment rates have risen in accordance with family income and parents’ educational attainment level (Choy, 1999). Nevertheless, proportional representation in higher education remains a distant goal for minorities and Hispanics in particular. Interestingly, 90% of Hispanics live in only 10 states,

mostly in the South region (de los Santos Jr. & Rigual, 1994). The United States cannot remain competitive globally if 20% of its population stays at low educational attainment levels. Paulsen and St. John (2002) found that Latinos chose colleges with a lower cost of attendance, and these students were more loan averse than other populations. More research is needed to understand how Hispanics or Latinos react to college costs (Paulsen & St. John, 2002). If these students continue to select institutions with lower cost, which most often means two-year institutions, educational attainment is reduced, and social stratification is furthered.

In their 2009 report, St. John and colleagues illustrated that White representation in public four-year colleges nearly equaled their proportion of the U.S. population (a 1.0 representation). Asian Americans were overrepresented in higher education, compared to their percentage of the population. African American representation in four-year public institutions was 80% of the portion of the U.S. population that was African American in 2004, so the college-going rate for African Americans was slightly less than equal to their percentage of the population, although that rate had increased since 1992 (St. John et al., 2009). In 1992, Hispanic representation in four-year public colleges equaled only half of their proportion of the total U.S. population. That rate had improved slightly, to 60%, by 2004 (St. John et al., 2009).

Despite growing enrollment in higher education overall, certain gaps remain with respect to socioeconomic status and race (Perna et al., 2008). Higher education opportunity in America was designed to encourage participation and minimize gaps in enrollment along racial and income lines. However, many high school graduates face barriers to enrollment, based on discrepancies in cultural and social capital (parental involvement, financial aid contacts, values, and norms), race, and inadequate finances (Perna & Titus, 2004; St. John et al., 2005). Thus, enrollment in four-year institutions by low-income students is declining.

In 1992, 54% of college-going low-income students matriculated at four-year colleges; by 2004, that figure had dropped to 40% (Advisory Committee on Student Financial Assistance, 2010). St. John (2005) contended that loans and tax credits improved college affordability for middle-income students but did little to equalize opportunity for low-income students.

Institutional aid has combated the decline in purchasing power of the Pell Grant for some needy students (St. John, 2005). Need-based grants result in a stronger effect on enrollment than do non-need based grants at the state level. However, state funding for need-based aid has failed to keep up with tuition increases since 1990 (St. John, 2005).

The gender gap among White and Hispanic students of traditional age has grown since 1990, with a significantly larger proportion of female undergraduates from low-income White families as well as low- and middle-income students from Hispanic families (American Council on Education, 2006). While bachelor's degrees are increasing for both men and women, college participation rates by women are on the rise, particularly among low-income students (Gohn & Albin, 2006). The entering freshman class in 2006 consisted of 55% female (Pryor et al., 2007). Of the lowest-income dependent undergraduate students, only 44% was male; however, in the highest-income quartile, 52% of this population was male (ACE, 2006). Likewise, Paulsen and St. John (2002) found that low-income women attended college at a higher rate than low-income men. Low-income undergraduate students are more likely to be female and also racial/ethnic minorities, compared to their upper-income peers (Corrigan, 2003). American higher education is experiencing a "financial access" problem, not only across income, but also with regard to race/ethnicity and gender (St. John, 2003, p. 55).

Geographic Region, Carnegie Classification, and Campus Setting

In a recent Higher Education Research Institute (HERI) Report, college enrollment was predicted to increase through 2015 (Pryor et al., 2007). The prediction was based on overall growth in the U.S. population, which is becoming increasingly diverse. This population growth is concentrated in the South and the West, with the fastest-growing states being Arizona, Florida, Georgia, Nevada, and Texas (Gohn & Albin, 2006). Enrollment in public elementary and secondary schools is projected to grow by 13% in the West and 5% in the South, while decreasing in the Northeast and Midwest, by 2014. Moreover, the South is expected to continue producing more than half of the total Black high school graduates, while both the West and the South will continue to experience substantial gains in Hispanic high school graduation rates (Gohn & Albin, 2006). Such demographic changes ultimately will impact enrollment at the postsecondary level in a significant manner.

A review of the 2005 Carnegie Basic Classification system suggested that urban and suburban institutions tend to be medium and larger master's programs, while institutions of smaller master's program size generally are rural (The Carnegie Foundation for the Advancement of Teaching, 2010b). Colleges and universities located in the West and South, the two geographic regions projected to experience significant growth in college enrollment, are primarily rural or suburban, with the exception of Texas and California. Gohn and Albin (2006) reported that 76.8% of the current college enrollment is served by public institutions, and nearly 71% of all college students were enrolled in four-year institutions. Therefore, enrollment patterns at public master's-level institutions were the focus of the present study. However, enrollment patterns vary according to income, race, gender, geographic region, Carnegie Classification, and campus setting, so each variable will be examined individually.

Conclusion

The IHEP (2002) report highlighted the trend of low-income students moving to lower-priced colleges, particularly community colleges. Indeed, college choice has evolved from the dilemma of public versus private education to the choice of two-year or four-year institution, indicating that choice is constrained by price for a significant number of students. This study assumed that, based on the financial factors related to the total cost of attendance and aid, students will decide whether or not to pursue higher education. Then, those students who do choose to pursue postsecondary education are faced with the decision of where to enroll. At that point, prospective students may consider all affordable options and choose to attend the best institution based on fit. Hence, the present study explored financial factors and institutional characteristics exclusively, in an attempt to explain low-income undergraduate enrollment at public master's-level institutions.

From an economic perspective, an individual's income level is expected to drive decisions that have an associated cost (McPherson & Schapiro, 1991). Keeping in mind the influence of financial factors specifically, this study followed an economic approach to explore the relationship among the total cost of undergraduate attendance, various forms of financial aid, and low-income undergraduate enrollment at public master's-level institutions. Perna and Titus (2004) contended that "an individual makes a decision about attending college by comparing the benefits with the costs for all possible alternatives and then selecting the alternative with the greatest net benefit, given the individual's personal tastes and preferences" (p. 505). Thus, expected benefits and costs, paired with a student's financial resources, influence the decision of whether or not to invest in higher education (Paulsen & St. John, 1997). If the student decides

that enrolling in higher education is a worthy investment, then individual preferences regarding location and campus setting will determine what type of institution is chosen.

Likewise, economic research proposes that enrollment yields will improve as financial aid increases (DesJardins, 2001). Moreover, the economic concept of supply and demand suggests that enrollment declines when tuition rises (Shin & Milton, 2006). Therefore, DesJardins (2001) contended that “enrollments will rise (decline) if tuition is reduced (increased) for a particular group” (p. 655). Accordingly, St. John et al. (2000) discussed the concept of targeted subsidies, concluding that institutions may influence student enrollment behavior by targeting grant aid toward specific groups based on their perceived ability to pay. Eliminating economic barriers, which often prevent low-income enrollment in higher education, is critical. By reducing the net price, need-based institutional aid may be effective at equalizing students, and the present study explored such a relationship.

Shin and Milton (2006) reiterated the recommendation by St. John and Starkey (1995) that more frequent research should be conducted in order “to determine whether a seemingly fluid student price response has changed as a result of changes in financial policy, the demand for educated labor, or student choice” (p. 234). As such, this study focused on identifying any explanatory relationship between financial aid and undergraduate enrollment. Since net price and ability to pay represent two main components of college affordability, financial factors were expected to explain low-income undergraduate enrollment as examined in this study.

To summarize, undergraduate enrollment in higher education is changing, due to the ever-increasing costs of attendance at four-year colleges in particular. Given the present income inequality in the U.S., low-income students demonstrate the least ability to pay for the exorbitant cost of higher education. As Hossler and Gallagher (1987) determined, socioeconomic status is

significant at the Choice stage. Hence, low-income students are less likely to choose a more costly, or most selective, institution. As St. John and others have found, low-income students and minorities are more loan averse and tend to select a more affordable college, which generally equates to a two-year college or a less prestigious four-year institution. However, as Gohn and Albin (2006) suggested, a bachelor's degree equals social capital.

Low-income students especially can benefit from accruing additional capital through higher education. The challenge is that this population may not possess adequate social and cultural capital to navigate the complicated financial aid process, and thus low-income students are left to choose an institution that they can afford without financial grant aid. Thus, the present study will explore what master's colleges and universities may do to address the problem of affordability, in order to encourage low-income students to enroll in undergraduate degree programs. Realizing that the problem may not be limited to financial factors, various institutional characteristics were included in the study as well. The goal of this research study was to uncover a specific combination of financial factors and institutions, which was most effective at enrolling low-income undergraduate students in master's-level institutions in the U.S. during the 2007-2008 academic year.

Therefore, the present study was focused on financial factors and institutional characteristics that may influence low-income undergraduate enrollment. Monetary factors, as identified by IHEP (2002), include price, aid, and ability to pay. As DesJardins (2001) contended, ability to pay is influenced by family income, race/ethnicity, and gender. Selected institutional characteristics consist of geographic location, Carnegie Classification, and campus setting. Therefore, the independent variables used in this study include these *financial factors* (Heller, 2001; Perna & Li, 2006): total cost of undergraduate attendance (in-state), total cost of

undergraduate attendance (out-of-state), number of Pell Grant recipients, average Pell Grant award, number of recipients of other Federal grant aid, average amount of other Federal grant aid award, number of recipients of state aid, average amount of state aid award, number of recipients of need-based institutional aid, average amount of need-based institutional aid award, number of recipients of non-need-based institutional aid, and average amount of non-need-based institutional aid award, as well as these *institutional characteristics* (Kinkead, 2009; The Carnegie Foundation for the Advancement of Teaching, 2010a; U.S. Census Bureau, 2010): total undergraduate enrollment, percentage full-time undergraduate enrollment, percentage racial/ethnic minority undergraduate enrollment, percentage female undergraduate enrollment, geographic location (Northeast, South, Midwest, or West), Carnegie Classification (Master's Colleges and Universities- smaller, medium, or larger programs), and campus setting (rural, urban, or suburban). In this cross-sectional study, the forward method of multiple linear regression analysis was employed to test the independent variables in order to determine their ability to explain the outcome – in this case, low-income undergraduate enrollment at public master's-level institutions. The methodology is discussed in detail in the next chapter.

CHAPTER III:

METHODS

Introduction to Overall Research Approach

The primary objective in conducting this study was to identify a unique combination of financial factors and institutional characteristics that may explain low-income undergraduate enrollment at public master's-level institutions. Once this information was derived, the goal of this study was to inform policymakers of those elements that were more related to enrolling low-income undergraduate students and reducing the enrollment gap that exists among various income groups within this sector of higher education (Paulsen & St. John, 2002; St. John, 2005; Walpole, 2003). With an enhanced understanding of the impact of financial aid on college choice and enrollment, enrollment managers may make more informed decisions regarding the application of scarce resources to increase the overall diversity of the student body (Hossler & Kalsbeek, 2008). Moreover, if master's-level institutions aim to provide access to higher education, then enrollment managers need to understand what combination of financial factors and institutional characteristics correlates with low-income students and their undergraduate enrollment.

The research approach that was followed in the present study was quantitative and cross-sectional. Cross-sectional studies analyze a snapshot of enrollment, and this design is employed typically for college choice studies (Shin & Milton, 2006). Such studies may utilize cross-sectional data in order to evaluate the effect that independent variables have on a dependent variable, representing some aspect of college choice. The present study sought to reveal a

relationship between financial factors, institutional characteristics, and low-income undergraduate enrollment at public master's-level institutions. Therefore, a cross-sectional design provided an appropriate starting point for this research topic.

The dependent variables in this study included both the total number and percentage of low-income undergraduate enrollment at public master's-level institutions in the continental U.S. The independent variables consisted of the following: mean total cost of undergraduate attendance for both in-state and out-of-state residents, mean total financial aid awarded by institutions by aid type (Pell, other Federal grant, state, institutional need-based, and institutional non-need-based), number of undergraduate students receiving each form of aid, average financial aid amount (Pell, other Federal grant, state, institutional need-based, and institutional non-need-based) per student, total undergraduate enrollment, percentage female undergraduate enrollment, percentage racial/ethnic minority undergraduate enrollment, percentage full-time undergraduate enrollment, Carnegie Classification (Master's- smaller, medium, or larger), geographic region (South, Northeast, Midwest, or West), and campus setting (rural, urban, or suburban). This study assumed that college enrollment decisions are influenced by financial factors, represented here by total cost of undergraduate attendance and various forms of financial aid, as well as institutional characteristics, including geographic location, Carnegie Classification, campus setting, percentage of female undergraduate enrollment, and percentage of minority undergraduate enrollment.

Quantitative analysis, specifically multiple linear regression, serves as the best method when the goal of the study is to measure the relationship between variables (Witte & Witte, 2007). Existing relationships may be expressed using descriptive or inferential statistics. Since a descriptive study observes the variables once, rather than before and after a treatment, only

associations or correlations – but not causality – may be determined. Therefore, the present study employed both descriptive and inferential statistics. First, the mean was calculated for each variable in the study. Next, the undergraduate enrollment data was disaggregated and cross-tabulated according to income, race, gender, geographic region, Carnegie Classification, and campus setting. By conducting a multiple linear regression analysis, using the forward method, any relationship between the dependent variable and independent variables may be assessed. In order to determine the impact of various combinations of independent variables, the variance in the regression was calculated and tested for statistical significance in relation to the dependent variable.

The unit of analysis in the present research study was the institution. Therefore, the present study was focused on institution-level variables in an attempt to characterize the way that particular financial and institutional elements may impact undergraduate enrollment by low-income students at public master's-level institutions. Because most studies of this nature have focused exclusively on student-level variables, the design of the present study was unique and marks a valuable addition to the extant literature on this topic. This study sought to determine if the percentage and total headcount of low-income undergraduate enrollment (dependent variable) at public master's-level institutions during the 2007-2008 academic year may be explained by any of the financial factors or institutional characteristics (independent variables) in the same academic year.

Study Population

The 2005 Carnegie Basic Classification system was used to identify the institutions examined in this study. Specifically, this study focused on undergraduate enrollment at a particular level of control and Carnegie type: public Master's Colleges and Universities. NCES

researchers recommended that public and private institutions be studied independently, since they function under unique circumstances (Gansemer-Topf & Schuh, 2005). Since “the prices students pay and the financing strategies they adopt vary substantially with institutional level and control” (Choy, 2000, p. 4), the present study analyzed public master’s-level institutions exclusively.

According to the 2005 Carnegie Basic Classification system, Master's Colleges and Universities include all institutions that produce a minimum of 50 master’s degrees but less than 20 doctoral degrees annually (The Carnegie Foundation for the Advancement of Teaching, 2010b). Master's institutions are divided by the Carnegie Basic Classification into three groups – smaller, medium, and larger – based on program size. From the current Carnegie Classification list, as of December 2010, 267 public master’s-level institutions were identified (The Carnegie Foundation for the Advancement of Teaching, 2010a). Two of those institutions, University of Guam and University of Puerto Rico-Mayaguez, were excluded based on location outside of the 50 States, and the Naval Postgraduate School was excluded because this institution’s enrollment profile is exclusively graduate/professional (The Carnegie Foundation for the Advancement of Teaching, 2010a). Institutions which did not offer on-campus housing were excluded as well. Additionally, 56 institutions were excluded due to missing data. Therefore, the study population consisted of 208 public master’s-level institutions. Studying public master’s-level institutions was deemed important, given the current problem of access and affordability. Historically, Master’s Colleges and Universities have served low-income and minority students (Reed & Alexander, 2009). Identifying any financial factors and institutional characteristics that are correlated to low-income undergraduate enrollment in public master’s-level institutions will add to the extant literature on access to higher education.

The 208 institutions included in this study population were organized according to geographic region, Carnegie Classification, and campus setting. The four geographic regions used in this study adhere to the U.S. Census-defined regions: Midwest, Northeast, South, and West (U.S. Census Bureau, 2010). The program size at Master's Colleges and Universities, as determined by the 2005 Carnegie Basic Classification system, ranges from smaller to medium to larger (The Carnegie Foundation for the Advancement of Teaching (2010a). Finally, the campus setting: rural, suburban, or urban, was defined in the Kinkead (2009) typology. The 208 institutions included in this study are listed in Appendix B. A summary table of the institutions is presented below.

Table 1

Summary of Residential, Public Master's-Level Institutions Included in the Present Study by Geographic Region, Carnegie Basic Classification, and Campus Setting

| Characteristic | Region | Carnegie Classification | Setting |
|--------------------------------|----------------|-------------------------|---------|
| Region | | | |
| | South* | 88 | |
| | Midwest | 41 | |
| | Northeast | 43 | |
| | West | 36 | |
| | <i>N</i> = 208 | | |
| Carnegie Classification | | | |
| | Larger* | 131 | |
| | Medium | 56 | |
| | Smaller | 21 | |
| | <i>N</i> = 208 | | |
| Setting | | | |
| | Rural* | | 137 |
| | Suburban | | 41 |
| | Urban | | 30 |
| | <i>N</i> = 208 | | |

*By virtue of being the largest subcategory within the characteristic, this group was used as the reference group in the regression analyses.

Data Collection

This research study utilized existing national data. Approval for the use of existing national data sets was sought from The University of Alabama Institutional Review Board. The mean total cost of undergraduate attendance (tuition, required fees, plus estimated expenses), in-state and out-of-state, was calculated first. The following averages were computed as well: mean Pell Grant award, mean other Federal grant aid award, mean state aid award, mean need-based

institutional aid award, and mean non-need-based institutional aid award at public master's-level institutions, in order to include financial factors that may relate to undergraduate enrollment (IHEP, 2002; Perna & Li, 2006).

Additionally, undergraduate enrollment data for the 208 public master's-level institutions was disaggregated and cross-tabulated according to income, race, and gender (DesJardins, 2001), along with categorical data regarding public Master's Colleges and Universities' program size (smaller, medium, or larger) as determined by the 2005 Carnegie Basic Classification system (The Carnegie Foundation for the Advancement of Teaching, 2010a), geographic region (Midwest, Northeast, South, or West) as defined by the U.S. Census (2010), and campus setting (rural, suburban, or urban) as characterized by the Kinkead (2009) typology. This data represents institutional characteristics that may relate to undergraduate enrollment (IHEP, 2002). The following sources were used to collect data for this study: IPEDS, the Delta Cost Project, and the *Annual Survey of Colleges* published by The College Board.

Integrated Postsecondary Education Data System

The primary data set was obtained from the Integrated Postsecondary Education Data System [IPEDS], a system of institutional surveys administered by the U.S. Department of Education. The IPEDS Data Center provides institution-level data regarding tuition and enrollment patterns, as well as data regarding amounts of various forms of financial aid (National Center for Education Statistics, 2010a). IPEDS data may be acquired freely from the government website by accessing data stored in the IPEDS Data Center.

The pre-defined IPEDS surveys used in the present study included Student Financial Aid (SFA), Institutional Characteristics (IC), Finance (F), and Fall Enrollment (EF). From the SFA survey, financial aid data regarding the number of students receiving each aid type as well as the

average aid award amount was ascertained. The IC survey revealed prices for in-state and out-of-state students. The total dollar amounts of the various forms of financial aid were extracted from the F survey. The EF survey yielded the number of female undergraduates enrolled, and from that data, the percentage of female undergraduate enrollment was calculated. Additionally, the EF survey provided data regarding undergraduate enrollment by race/ethnicity and also delineated full-time undergraduate enrollment and total undergraduate enrollment (National Center for Education Statistics, 2010a). This data may be downloaded directly from the IPEDS Data Center website as CSV files and transferred to SPSS[®], the software used for statistical analysis in the present study.

Delta Cost Project

The Delta Cost Project [DCP] data set was taken from a longitudinal study that had sorted data on the number of undergraduate students from low-income families enrolled each year (Delta Project, 2010). DCP enrollment data is derived from the IPEDS Fall Enrollment survey. DCP uses IPEDS data to develop measures of costs per student and costs per degree earned. The unit of analysis, the institution, is sorted by Carnegie Classification and control (public or private nonprofit). This data set is available online for no charge. The total number of low-income undergraduate students was obtained from the DCP database, and then the percentage of low-income undergraduate enrollment was calculated using this data. The downloaded data was saved as an Excel file and imported to SPSS[®] for analysis. Institutional aid is not differentiated between need-based and non-need-based in the DCP data set. Therefore, one additional data set was required.

Annual Survey of Colleges, The College Board

The College Board maintains each institution's Common Data Set, and the ASC disaggregates need-based from non-need-based institutional aid each academic year (The College Board, 2010b). This data set was included because the effect of need-based institutional aid on low-income undergraduate enrollment is of primary interest to the researcher. Therefore, the total dollar amounts awarded by institutions as need-based aid and non-need-based aid were gleaned from this data source. The required ASC data points are available for purchase from The College Board for a fee (The College Board, 2010b). Since this fee was not prohibitive, the 2009 ASC data file was purchased for use in the present study. That year's survey included the final figures for institutional aid disbursed in the 2007-2008 academic year, and enrollment data from this source is based on fall enrollment. ASC data is distributed as an Excel file; therefore, the data was uploaded to SPSS[®] for analysis.

Thus, the data used for this statistical analysis was obtained from IPEDS, the Delta Cost Project, and The College Board and combined into one complete data set for the academic year 2007-2008. Appendix C presents a glossary for the data points utilized in the present study. Institutions with incomplete data from either IPEDS or the Delta Cost Project for the academic year under study were excluded. The 208 institutions that met all criteria except having reported data on the need-based and non-need-based institutional aid variables were included in the descriptive analysis of the variables by geographic region, Carnegie Classification, and campus setting, which was conducted in order to answer the first research question. Then, the compiled data for these 208 institutions was analyzed in order to answer the second and third research questions presented below.

Research Questions

This study endeavored to answer the following research questions, developed using the literature on student price response:

1. In what ways do the following financial factors and institutional characteristics differ among public, residential Master's Colleges and Universities in the U.S., which serve primarily full-time undergraduate students, based upon the geographic region, 2005 Carnegie Basic Classification, and campus setting?
 - a. Mean in-state total COA for on-campus undergraduate students
 - b. Mean out-of-state total COA for on-campus undergraduate students
 - c. Number (and percentage) of first-time, full-time, degree-seeking students receiving Pell Grants
 - d. Mean amount of Pell Grant per student
 - e. Total amount of aid awarded to first-time, full-time, degree-seeking undergraduate students in the form of Pell Grants
 - f. Number (and percentage) of first-time, full-time, degree-seeking students receiving other Federal grant aid
 - g. Mean amount of other Federal grant aid per student
 - h. Total amount of aid awarded to first-time, full-time, degree-seeking undergraduate students in the form of other Federal grant aid
 - i. Number (and percentage) of first-time, full-time, degree-seeking students receiving state and local aid
 - j. Mean amount of state and local aid per student

- k. Total amount of aid awarded to first-time, full-time, degree-seeking undergraduate students in the form of state and local aid
- l. Number (and percentage) of first-time, full-time, degree-seeking students receiving institutional aid, per IPEDS
- m. Mean amount of institutional aid per student
- n. Total amount of aid awarded to first-time, full-time, degree-seeking undergraduate students as institutional aid
- o. Number (and percentage) of first-time, full-time, degree-seeking students receiving need-based institutional aid, per the ASC
- p. Mean amount of need-based institutional aid per student
- q. Total amount of aid awarded to first-time, full-time, degree-seeking undergraduate students as need-based institutional aid
- r. Number (and percentage) of first-time, full-time, degree-seeking students receiving non-need-based institutional aid, per the ASC
- s. Mean amount of non-need-based institutional aid per student
- t. Total amount of aid awarded to first-time, full-time, degree-seeking undergraduate students as non-need-based institutional aid
- u. Total undergraduate enrollment
- v. Percentage of undergraduate enrollment that is full-time
- w. Percentage of undergraduate enrollment that is racial/ethnic minority
- x. Percentage of undergraduate enrollment that is female
- y. Total low-income undergraduate enrollment
- z. Percentage of undergraduate enrollment that is low-income

2. To what degree does the combination of financial factors and institutional characteristics explain the number of low-income undergraduate students enrolled at public, residential Master's Colleges and Universities in the U.S., which serve primarily full-time undergraduate students?
3. To what degree does the combination of financial factors and institutional characteristics explain the percentage of low-income undergraduate students enrolled at public, residential Master's Colleges and Universities in the U.S., which serve primarily full-time undergraduate students?

Data Analysis

In the present research study, the following financial factors were analyzed: total cost of undergraduate attendance for in-state and out-of-state undergraduate students living on campus (a sum figure of tuition, required fees, and estimated expenses), Pell Grants, other Federal grant aid, state aid, need-based institutional aid, and non-need-based institutional aid awards. Institutions were categorized according to geographic region, Carnegie Classification, and campus setting. Additionally, institutional enrollment data for all first-time, full-time, degree-seeking, undergraduate students at public master's-level institutions was examined according to race and gender. Focusing on full-time undergraduate enrollment is a standard practice in higher education research, as the sampling of part-time undergraduate enrollment may not be representative of the entire undergraduate student population (Astin, 1993). Moreover, environmental factors may affect full-time and part-time students differently, and combining distinct populations in one study may confound the effects (Astin, 1993).

Data acquired from IPEDS, the Delta Cost Project, and The College Board's *Annual Survey of Colleges* was imported into SPSS[®] for statistical analysis. The collected data was

analyzed, using the forward method of multiple linear regression, in order to determine which combination of financial factors and institutional characteristics (the independent, explanatory variables) best explained the number of low-income undergraduate students enrolled at public master's-level institutions (the dependent, explained variable). Furthermore, multiple linear regression analysis was conducted again to identify a particular combination of financial factors and institutional characteristics (the independent, explanatory variables) that best explained the percentage low-income undergraduate enrollment at public master's-level institutions (the dependent, explained variable).

Therefore, the present study sought first to describe the aforementioned financial factors and institutional characteristics of public Master's Colleges and Universities. As such, the present study employed basic descriptive statistics to portray the 208 institutions included in this study population. Descriptive statistics on low-income undergraduate enrollment at public master's-level institutions also were reported based on female, minority, full-time, and total undergraduate enrollment at those institutions. Describing undergraduate enrollment by gender and minority status is useful (DesJardins, 2001), since students may respond uniquely to various prices and subsidies, based on distinctive student characteristics (Paulsen, 1998). Gender and racial/ethnic minority status influence the student's ability to pay (DesJardins, 2001). Tuition and financial aid variables must be included because subsidies work in relation to tuition (E. St. John, personal communication, October 11, 2010). Institutional characteristics, including geographic location, Carnegie Classification, and campus setting, influence college choice decisions and warrant inclusion in this study (IHEP, 2002).

Additionally, the study employed inferential statistics to measure the extent to which low-income undergraduate enrollment at public master's-level institutions may be explained by

the various financial factors: total cost of attendance and all forms of financial aid, and institutional characteristics: percentage female enrollment, percentage minority enrollment, geographic region, Carnegie Classification, and campus setting. These statistics were analyzed for evidence of an explanatory relationship among the various financial factors, institutional characteristics, and the number or percentage of low-income undergraduate enrollment at public master's-level institutions, by employing multiple linear regression analysis. Multiple linear regression is used regularly when the researcher's interest is to reveal a predictive or explanatory relationship (Tabachnick & Fidell, 2007). Keup (2006) and others have posited that "multivariate analyses yield the maximum information about the potential causal connections among variables" (p. 35).

By conducting a multiple linear regression analysis, using the forward method, any relationship between the dependent variable and numerous independent variables may be determined (Tabachnick & Fidell, 2007). The various combinations of financial factors and institutional characteristics were tested for significance. Then, these results were analyzed in order to develop a model, which included only those variables that contributed significantly to the explanation of low-income undergraduate enrollment at public master's-level institutions. The following model assumptions for multiple linear regression analysis were checked and met: linearity, normality, independence, and constant variance. A data dictionary and a data analysis table are included as Appendix D and Appendix E, respectively. The normal probability plot and all partial plots from each regression are displayed in Appendix F.

Delimitations and Limitations

Time, resources, context, and design are delimitations that exist in all research studies (Upcraft, 1996). This study reviewed data for a limited time period. Student response to tuition and aid may vary in different time periods (St. John & Starkey, 1995; as cited in Shin & Milton, 2006). Additionally, only public Master's Colleges and Universities were examined in this study. Therefore, results may not be generalizable to private institutions, two-year colleges, or four-year institutions of a different Carnegie type. Moreover, only those institutions located within the 50 states that allow enrollment by the general public were included in this study. Campuses that do not provide on-campus housing were excluded from this study, due to the differences in added costs associated with living on-campus as opposed to living at home with family. Institutions that reported financial details collectively as a system also were excluded because individual institutional amounts for cost of attendance and various forms of financial aid could not be distinguished from the lump sum. Finally, institutions with less than 50% full-time enrollment were excluded because this study focused on institutions that primarily served full-time undergraduate students.

The quality of the existing data may present a limitation. Responses may have been missing or reported inaccurately. To partially address this limitation, institutions with incomplete data related to the research questions in this study were excluded. Also, whenever testing financial aid, the researcher must note the limitation of self-selection bias when students are required to apply for aid (DesJardins, 2001; DesJardins et al., 2006).

Ethical Considerations and Quality Assurance

IRB approval for using existing national data sets from IPEDS, DCP, and the College Board was sought and obtained. The IRB approval letter provided by The University of

Alabama Office of Research is included in Appendix G. The unit of analysis in this study was the institution, not the student. This study used compiled, aggregated data of institution-level variables. Revealing the identity of any individual students was not a risk because all personal information remained unknown to the researcher. Since national data was utilized, the methodology may be reproducible for different institution types or levels of control. Also, the methods may be applied to other academic years.

Summary

This chapter presented the overall methodology that was employed to answer the three research questions, which guided the present study. After discussing the research approach, this chapter offered a review of the study population and indicated the data sources, including how the data was acquired. The dependent variables and independent variables were listed, and research questions were presented. The data analysis techniques and multiple linear regression model specifications were described next. Finally, this chapter identified delimitations and limitations, in addition to ethical considerations and reliability of the results. The results of the analyses are presented in the following chapter.

CHAPTER IV:
PRESENTATION OF DATA

Introduction

The purpose of conducting this research study was to gain a better understanding of low-income undergraduate enrollment patterns at public master's-level institutions in the U.S. By analyzing these independent variables: total in-state cost of attendance (COA), total out-of-state COA, Pell Grant aid, other Federal grant aid, state aid, institutional aid, need-based institutional aid, non-need-based institutional aid, total undergraduate enrollment, full-time undergraduate enrollment, minority undergraduate enrollment, female undergraduate enrollment, geographic region, Carnegie Classification, and campus setting, this study aimed to determine if any relationship existed among financial factors, institutional characteristics, and low-income undergraduate enrollment. The data presented in this chapter represent the results from descriptive statistics and multiple linear regression analyses.

The present research study included 208 public master's-level institutions in the U.S., which satisfied the following criteria: 1) permitted enrollment by the general public, 2) offered on-campus housing, 3) reported financial data as an individual institution, rather than a university system, 4) maintained primarily full-time undergraduate enrollment, and 5) were classified by Carnegie as master's-level Larger, Medium, or Smaller institutions. The institutions that made up this study population were grouped according to geographic region, Carnegie Classification, and campus setting. The first research question was answered by employing descriptive statistics. Multiple linear regression analysis was used to answer the two remaining research questions. The results for the three research questions are presented below.

Research Question One

In what ways do the following financial factors and institutional characteristics differ among public, residential Master's Colleges and Universities in the U.S., which serve primarily full-time undergraduate students, based upon the geographic region, 2005 Carnegie Basic Classification, and campus setting?

Financial Factors by Geographic Region

To answer the first part of this research question, the variables were disaggregated according to geographic region. The results of the descriptive analysis yielded several themes and some interesting differences. First, the South region was the most affordable, on average, for in-state COA, while the Midwest region was the most affordable for out-of-state COA. Moreover, the greatest numbers of Pell recipients were located in the South and West regions, and also larger Pell Grant awards were disbursed in the West and the South. The highest percentage of undergraduates who were Pell recipients (38.3%) was found at institutions in the South region, while the West region disbursed the greatest total dollars in Pell Grant aid. The most recipients of other Federal grant aid were enrolled in institutions in the West region, but the greatest average award amounts of other Federal grant aid were disbursed in the Midwest.

The most recipients of state and local aid attended institutions in the South and West, while the highest percentages of state/ local aid recipients were enrolled in institutions in the South (42.6%) and Northeast (43.3%). Greater state and local aid average awards were distributed in the South and Northeast regions as well. However, the latter point may be explained by the fact that institutions located in the Northeast region presented the highest COA for both in-state and out-of-state students. Thus, higher state and local aid awards may have offset the higher COA for public master's-level institutions in the Northeast geographic region.

Tables 2, 3, 4, and 5 present the data related to the cost of attendance and various forms of financial aid (Pell Grant, other Federal grant aid, and state/ local aid) at the 208 public master's-level institutions examined in the present research study.

Table 2

A Comparison of the Average Total COA for In-state and Out-of-state On-campus Undergraduate Students Enrolled in Public Master's-level Institutions by Geographic Region

| Region | Count | Average Total Cost of Attendance, In-State | Average Total Cost of Attendance, Out-of-State |
|-------------|-------|--------------------------------------------|------------------------------------------------|
| Midwest | 41 | 15,567 | 21,777 |
| Northeast | 43 | 18,076 | 24,450 |
| South | 88 | 14,874 | 22,341 |
| West | 36 | 16,441 | 25,566 |
| All Regions | 208 | 15,944 | 23,224 |

Data Source: IPEDS Institutional Characteristics Survey, 2007-2008

Table 3

A Comparison of the Average Number of Pell Grant Recipients, Average Pell Grant Award, Percentage of Pell Grant Recipients, and Total Pell Grant Dollars at Public Master's-level Institutions by Geographic Region

| Region | Count | Average Number Pell Recipients | Average Pell Grant Award | Average % Pell Recipients | Average of Total Pell \$ |
|-------------|-------|--------------------------------|--------------------------|---------------------------|--------------------------|
| Midwest | 41 | 399 | 2,843 | 27.7 | 6,707,659 |
| Northeast | 43 | 302 | 2,946 | 27.8 | 4,888,557 |
| South | 88 | 429 | 3,077 | 38.3 | 7,558,399 |
| West | 36 | 528 | 3,146 | 34.3 | 11,826,644 |
| All Regions | 208 | 414 | 3,016 | 33.4 | 7,577,501 |

Data Sources: IPEDS Student Financial Aid Survey and Finance Survey, 2007-2008

Table 4

A Comparison of the Average Number of Other Federal Grant Aid Recipients, Average Other Federal Grant Aid Award, Percentage of Other Federal Grant Aid Recipients, and Total Other Federal Grant Aid Dollars at Public Master's-level Institutions by Geographic Region

| Region | Count | Average # Other Federal Grant Recipients | Average Other Federal Grant Aid Award Recipients | Average % Other Federal Grant Aid | Average of Total Other Aid Federal Grant Aid \$ |
|-------------|-------|------------------------------------------|--------------------------------------------------|-----------------------------------|-------------------------------------------------|
| Midwest | 41 | 290 | 1,138 | 18.7 | 889,299 |
| Northeast | 43 | 213 | 1,089 | 20.0 | 985,095 |
| South | 88 | 260 | 973 | 21.8 | 1,059,790 |
| West | 36 | 383 | 945 | 22.1 | 1,062,970 |
| All Regions | 208 | 278 | 1,024 | 20.8 | 1,011,292 |

Data Sources: IPEDS Student Financial Aid Survey and Finance Survey, 2007-2008

Table 5

A Comparison of the Average Number of State Aid Recipients, Average State Aid Award, Percentage of State Aid Recipients, and Total State Aid Dollars at Public Master's-level Institutions by Geographic Region

| Region | Count | Average # State Aid Recipients | Average State Aid Award | Average % State Aid Recipients | Average of Total State Aid \$ |
|-------------|-------|--------------------------------|-------------------------|--------------------------------|-------------------------------|
| Midwest | 41 | 508 | 2,257 | 31.5 | 1,528,929 |
| Northeast | 43 | 475 | 2,962 | 43.3 | 6,338,065 |
| South | 88 | 557 | 2,896 | 42.6 | 3,828,495 |
| West | 36 | 522 | 2,016 | 33.4 | 13,744,248 |
| All Regions | 208 | 524 | 2,631 | 39.0 | 5,610,208 |

Data Sources: IPEDS Student Financial Aid Survey and Finance Survey, 2007-2008

Both the average institutional aid award and the total institutional aid dollars disbursed were the highest at institutions in the South. The greatest number and the highest percentage of institutional aid recipients was found at institutions in the West (38%). Moreover, the West had the greatest number of need-based institutional aid recipients, while institutions in the Northeast had the greatest percentage of need-based institutional aid recipients (35.5%) enrolled. The South provided the highest total dollar amount of need-based institutional aid, while the Northeast provided the highest average need-based institutional aid award. In contrast, the Midwest provided the highest total dollar amount of non-need-based institutional aid, and notably, several institutions located in this region have the tendency to enroll out-of-state undergraduate students (Rizzo & Ehrenberg, 2004). Again, the Northeast institutions provided the highest average non-need-based institutional aid award, while Southern institutions maintained the greatest number and percentage of non-need-based institutional aid recipients

(11.3%) enrolled. The College Board directed ASC respondents to exclude athletic awards from non-need-based aid.

Total institutional aid dollars gleaned from IPEDS were greater than the sum of total need-based and total non-need-based institutional aid dollars acquired by The College Board’s ASC across all four geographic regions. Table 6 depicts the institutional aid award variables obtained from IPEDS for all 208 institutions included in the study. Tables 7 and 8 present the need-based and non-need-based institutional aid award variables that were reported to The College Board via the 2009 ASC. Only 106 institutions reported data regarding need-based institutional aid, while 114 institutions reported data for non-need-based institutional aid, which may explain the discrepancy between the total institutional aid dollars reported by IPEDS versus The College Board.

Table 6

A Comparison of the Average Number of Institutional Aid Recipients, Average Institutional Aid Award, Percentage of Institutional Aid Recipients, and Total Institutional Aid Dollars at Public Master’s-level Institutions by Geographic Region

| Region | Count | Average # Institutional Aid Recipients | Average Institutional Aid Award | Average % Institutional Aid Recipients | Average of Total Institu- tional Aid \$ |
|-------------|-------|----------------------------------------------|---------------------------------------|----------------------------------------------|-----------------------------------------------|
| Midwest | 41 | 555 | 2,895 | 35.4 | 6,896,877 |
| Northeast | 43 | 254 | 2,805 | 23.4 | 3,284,410 |
| South | 88 | 354 | 3,301 | 29.8 | 6,941,244 |
| West | 36 | 577 | 2,952 | 38.0 | 4,091,952 |
| All Regions | 208 | 412 | 3,059 | 31.0 | 5,683,372 |

Data Sources: IPEDS Student Financial Aid Survey and Finance Survey, 2007-2008

Table 7

A Comparison of the Average Number of Need-based Institutional Aid Recipients, Average Need-based Institutional Aid Award, Percentage of Need-based Institutional Aid Recipients, and Total Need-based Institutional Aid Dollars at Public Master's-level Institutions by Geographic Region

| Region | Count | Average # Need-based Institutional Aid Recipients | Average Need- Based Institutional Aid Award | Average % Need-based Institutional Aid Recipients | Average of Total Need-based Institutional Aid \$ |
|-------------|-------|------------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------|--------------------------------------------------------|
| Midwest | 23 | 2,563 | 4,599 | 27.8 | 1,725,706 |
| Northeast | 29 | 2,298 | 5,301 | 35.5 | 1,437,174 |
| South | 35 | 2,619 | 4,703 | 33.6 | 2,008,968 |
| West | 19 | 4,685 | 5,201 | 32.9 | 1,056,057 |
| All Regions | 106 | 2,890 | 4,933 | 32.8 | 1,620,267 |

Data Source: The College Board, Annual Survey of Colleges, 2009

Table 8

A Comparison of the Average Number of Non-need-based Institutional Aid Recipients, Average Non-need-based Institutional Aid Award, Percentage of Non-need-based Institutional Aid Recipients, and Total Non-need-based Institutional Aid Dollars at Public Master’s-level Institutions by Geographic Region

| Region | Count | Average # Recipients Non-need Inst. Aid | Average Non-need-based Institutional Aid Award | Average % Non-need Inst. Aid Recipients | Average of Total Non-need-based Institutional Aid \$ |
|-------------|-------|-----------------------------------------|------------------------------------------------|-----------------------------------------|------------------------------------------------------|
| Midwest | 23 | 726 | 2,966 | 8.7 | 3,390,891 |
| Northeast | 29 | 447 | 4,016 | 7.1 | 1,449,258 |
| South | 43 | 883 | 3,044 | 11.3 | 2,539,583 |
| West | 19 | 459 | 2,429 | 3.5 | 880,558 |
| All Regions | 114 | 670 | 3,173 | 8.4 | 2,157,470 |

Data Source: The College Board, Annual Survey of Colleges, 2009

Institutional Characteristics by Geographic Region

Public master’s-level institutions located in the West region demonstrated the highest total enrollment count, on average, while the Northeastern institutions had the greatest full-time enrollment percentage (86.8%). The descriptive analysis revealed significantly higher minority undergraduate enrollment percentages in the South (43.6%) and West (49%) regions, as expected, based on population growth trends (Gohn & Albin, 2006; St. John et al., 2009). While there were higher percentages of female undergraduate enrollment in the South (59.1%) and Northeast (57.8%) regions, the percentage of females enrolled in all public master’s-level institutions (57.7%) was comparable to the national average of undergraduate women enrolled in higher education (Gohn & Albin, 2006; Pryor et al., 2007). Finally, the results revealed considerably higher numbers and percentages of low-income undergraduate students enrolled in

institutions in the South (31.4%) and West (28.9%) regions. Those results were reasonable, given the finding that more Pell Grant recipients were enrolled at institutions in the South and West regions, reinforcing the notion that Pell eligibility is a proxy for low-income status (St. John, 2003). Tables 9 and 10 below present the results of various enrollment numbers in a visual format for all 208 institutions included in the present study.

Table 9

A Comparison of the Average Number of Undergraduate Students, Percentage Full-time Undergraduate Students, Percentage Minority Undergraduate Students, and Percentage Female Undergraduate Students Enrolled at Public Master's-level Institutions by Geographic Region

| Region | Count | Average Number Undergraduates Enrolled | Average % Full-time Undergraduates Enrolled | Average % Minority Undergrads Enrolled | Average % Female Undergrads Enrolled |
|-------------|-------|----------------------------------------|---------------------------------------------|----------------------------------------|--------------------------------------|
| Midwest | 41 | 8,888 | 82.7 | 20.0 | 55.4 |
| Northeast | 43 | 6,568 | 86.8 | 26.1 | 57.8 |
| South | 88 | 7,146 | 81.8 | 43.6 | 59.1 |
| West | 36 | 12,086 | 77.3 | 49.0 | 56.9 |
| All Regions | 208 | 8,225 | 82.3 | 36.3 | 57.7 |

Data Source: IPEDS Fall Enrollment Survey, 2007-2008

Table 10

A Comparison of the Average Number of Low-income Undergraduate Students and Percentage of Low-income Undergraduate Students Enrolled at Public Master's-level Institutions by Geographic Region

| Region | Count | Average Number of Low-income Undergraduates Enrolled | Average Percentage of Low-income Undergraduate Enrollment |
|-------------|-------|------------------------------------------------------|-----------------------------------------------------------|
| Midwest | 41 | 1,753 | 20.5 |
| Northeast | 43 | 1,175 | 18.7 |
| South | 88 | 1,981 | 31.4 |
| West | 36 | 3,245 | 28.9 |
| All Regions | 208 | 1,988 | 26.2 |

Data Source: Delta Cost Project, 1987-2008 data file

Financial Factors by Carnegie Classification

Part two of this first research question examined the variables according to the Carnegie Basic Classification of the 208 institutions that comprised the study population. Descriptive statistical analysis revealed that public master's-level institutions of larger program size had a higher average cost of attendance, on average, for both in-state and out-of-state undergraduate students. Also, the number of Pell Grant recipients was greatest at institutions of larger program size, but the highest percentage of Pell Grant recipients (44.1%) was enrolled at the smaller programs. Institutions of smaller program size provided the largest average Pell Grant award, while the most total dollars for Pell Grants were spent by institutions in the larger program size category, as would be expected.

Not surprisingly, the highest number of other Federal grant aid recipients, the greatest average other Federal grant aid award, and the most total dollars spent on other Federal grant aid

were found at public institutions of larger program size. But still, more interestingly, the greatest percentage of other Federal grant aid recipients (23.4%) attended master's-level institutions of smaller program size. The larger master's-level institutions also maintained the highest averages for all four variables related to state/ local aid. Tables 11, 12, 13, and 14 depict the means for the cost of attendance as well as the various forms of Federal and state financial aid awarded at the 208 institutions. These averages were disaggregated according to the three program sizes of public Master's Colleges and Universities, as determined by the 2005 Carnegie Basic Classification system.

Table 11

A Comparison of the Average Total COA for In-state and Out-of-state Undergraduate Students Enrolled in Public Master's-level Institutions by Carnegie Classification

| Carnegie | Count | Average Total Cost of Attendance, In-State | Average Total Cost of Attendance, Out-of-State |
|--------------|-------|--------------------------------------------|------------------------------------------------|
| Larger | 131 | 16,256 | 23,891 |
| Medium | 56 | 15,324 | 22,260 |
| Smaller | 21 | 15,650 | 21,633 |
| All Carnegie | 208 | 15,944 | 23,224 |

Data Source: IPEDS Institutional Characteristics Survey, 2007-2008

Table 12

A Comparison of the Average Number of Pell Grant Recipients, Average Pell Grant Award, Percentage of Pell Grant Recipients, and Total Pell Grant Dollars at Public Master's-level Institutions by Carnegie Classification

| Carnegie | Count | Average Number Pell Recipients | Average Pell Grant Award | Average % Pell Recipients | Average of Total Pell \$ |
|--------------|-------|--------------------------------|--------------------------|---------------------------|--------------------------|
| Larger | 131 | 473 | 3,007 | 30.9 | 8,893,980 |
| Medium | 56 | 312 | 3,015 | 35.1 | 5,437,776 |
| Smaller | 21 | 320 | 3,068 | 44.1 | 5,071,117 |
| All Carnegie | 208 | 414 | 3,016 | 33.4 | 7,577,501 |

Data Sources: IPEDS Student Financial Aid Survey and Finance Survey, 2007-2008

Table 13

A Comparison of the Average Number of Other Federal Grant Aid Recipients, Average Other Federal Grant Aid Award, Percentage of Other Federal Grant Aid Recipients, and Total Other Federal Grant Aid Dollars at Public Master's-level Institutions by Carnegie Classification

| Carnegie | Count | Average # Other Federal Grant Aid Recipients | Average Other Federal Grant Aid Award | Average % Other Federal Grant Aid Recipients | Average of Total Other Federal Grant Aid \$ |
|--------------|-------|----------------------------------------------|---------------------------------------|----------------------------------------------|---------------------------------------------|
| Larger | 131 | 325 | 1,032 | 20.1 | 1,164,521 |
| Medium | 56 | 203 | 1,019 | 21.6 | 648,120 |
| Smaller | 21 | 178 | 992 | 23.4 | 1,023,894 |
| All Carnegie | 208 | 278 | 1,024 | 20.8 | 1,011,292 |

Data Sources: IPEDS Student Financial Aid Survey and Finance Survey, 2007-2008

Table 14

A Comparison of the Average Number of State Aid Recipients, Average State Aid Award, Percentage of State Aid Recipients, and Total State Aid Dollars at Public Master’s-level Institutions by Carnegie Classification

| Carnegie | Count | Average # State Aid Recipients | Average State Aid Award | Average % State Aid Recipients | Average of Total State Aid \$ |
|--------------|-------|--------------------------------|-------------------------|--------------------------------|-------------------------------|
| Larger | 131 | 633 | 2,662 | 39.9 | 7,354,857 |
| Medium | 56 | 349 | 2,556 | 36.6 | 2,518,178 |
| Smaller | 21 | 310 | 2,643 | 39.5 | 2,972,337 |
| All Carnegie | 208 | 524 | 2,631 | 39.0 | 5,610,208 |

Data Sources: IPEDS Student Financial Aid Survey and Finance Survey, 2007-2008

The highest percentage of institutional aid recipients (33.5%) was enrolled at master’s-level institutions of smaller program size. The greatest number of institutional aid recipients, however, was found at larger institutions. Master’s-level institutions of larger program size also spent the most total dollars in institutional aid and provided the highest average institutional aid awards to undergraduates. However, this greater amount of total institutional aid dollars was spread among significantly more undergraduate students at the master’s-level institutions classified as Larger. The institutional aid award variables obtained from IPEDS for all 208 institutions included in the study were disaggregated by Carnegie Classification and are depicted in Table 15.

Only 106 public master’s-level institutions reported data regarding need-based institutional aid. Of those, the eight smaller master’s-level institutions enrolled, by far, the highest percentage of need-based aid recipients (45.1%). The smaller institutions also offered the greatest average need-based institutional aid award. As expected, the larger institutions

awarded the most students the greatest total dollars in need-based institutional aid. The same patterns held true when the non-need-based institutional aid was disaggregated by Carnegie Classification, but 114 institutions reported data regarding this type of financial aid. Tables 16 and 17 present the need-based and non-need-based institutional aid awards, disaggregated by Carnegie Classification, as reported to The College Board via the 2009 ASC.

Table 15

A Comparison of the Average Number of Institutional Aid Recipients, Average Institutional Aid Award, Percentage of Institutional Aid Recipients, and Total Institutional Aid Dollars at Public Master's-level Institutions by Carnegie Classification

| Carnegie | Count | Average # Institutional Aid Recipients | Average Institutional Aid Award | Average % Institutional Aid Recipients | Average of Total Institu- tional Aid \$ |
|--------------|-------|----------------------------------------------|---------------------------------------|----------------------------------------------|-----------------------------------------------|
| Larger | 131 | 483 | 3,087 | 30.5 | 6,602,653 |
| Medium | 56 | 304 | 3,000 | 31.3 | 4,502,457 |
| Smaller | 21 | 255 | 3,033 | 33.5 | 3,097,912 |
| All Carnegie | 208 | 412 | 3,059 | 31.0 | 5,683,372 |

Data Sources: IPEDS Student Financial Aid Survey and Finance Survey, 2007-2008

Table 16

A Comparison of the Average Number of Need-based Institutional Aid Recipients, Average Need-based Institutional Aid Award, Percentage of Need-based Institutional Aid Recipients, and Total Need-based Institutional Aid Dollars at Public Master's-level Institutions by Carnegie Classification

| Carnegie | Count | Average # Need-based Institutional Aid Recipients | Average Need- Based Institutional Aid Award | Average % Need-based Institutional Aid Recipients | Average of Total Need-based Institutional Aid \$ |
|--------------|-------|------------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------|--------------------------------------------------------|
| Larger | 70 | 3,466 | 5,185 | 32.2 | 1,934,102 |
| Medium | 28 | 1,699 | 4,175 | 30.7 | 1,065,055 |
| Smaller | 8 | 2,011 | 5,384 | 45.1 | 817,447 |
| All Carnegie | 106 | 2,890 | 4,933 | 32.8 | 1,620,267 |

Data Source: The College Board, Annual Survey of Colleges, 2009

Table 17

A Comparison of the Average Number of Non-need-based Institutional Aid Recipients, Average Non-need-based Institutional Aid Award, Percentage of Non-need-based Institutional Aid Recipients, and Total Non-need-based Institutional Aid Dollars at Public Master's-level Institutions by Carnegie Classification

| Carnegie | Count | Average # Recipients Non-need Inst. Aid | Average Non-need-based Institutional Aid Award | Average % Non-need Inst. Aid Recipients | Average of Total Non-need-based Institutional Aid \$ |
|--------------|-------|-----------------------------------------|------------------------------------------------|-----------------------------------------|------------------------------------------------------|
| Larger | 74 | 707 | 3,272 | 7.4 | 2,293,105 |
| Medium | 31 | 592 | 2,526 | 9.8 | 1,866,173 |
| Smaller | 9 | 631 | 4,585 | 12.6 | 2,045,614 |
| All Carnegie | 114 | 670 | 3,173 | 8.4 | 2,157,470 |

Data Source: The College Board, Annual Survey of Colleges, 2009

Institutional Characteristics by Carnegie Classification

As would follow, the greatest undergraduate enrollment numbers were observed at institutions of larger program size. However, full-time enrollment percentages were comparable across program size, with smaller institutions demonstrating just a slightly higher percentage (84%) of full-time undergraduate students enrolled. Master's-level institutions of smaller program size maintained a significantly higher percentage (45.7%) of minority undergraduate students and also the highest percentage (60.2%) of female undergraduate students enrolled. While public master's-level institutions designated as Larger programs enrolled the greatest number of low-income undergraduates, these institutions enrolled the lowest percentage (24.3%) of the same student sub-population. On the contrary, master's-level institutions designated as Smaller enrolled the fewest number of low-income undergraduate students but had the highest percentage (35.7%) of low-income undergraduate students enrolled. Again, percentages

appeared more meaningful than numbers in the present research study. Tables 18 and 19 depict the undergraduate enrollment averages disaggregated by Carnegie Classification.

Table 18

A Comparison of the Average Number of Undergraduate Students, Percentage Full-time Undergraduate Students, Percentage Minority Undergraduate Students, and Percentage Female Undergraduate Students Enrolled at Public Master's-level Institutions by Carnegie Classification

| Carnegie | Count | Average Number Undergraduates Enrolled | Average % Full-time Undergraduates Enrolled | Average % Minority Undergrads Enrolled | Average % Female Undergrads Enrolled |
|--------------|-------|----------------------------------------|---------------------------------------------|----------------------------------------|--------------------------------------|
| Larger | 131 | 10,001 | 82.6 | 34.3 | 57.5 |
| Medium | 56 | 5,580 | 80.8 | 37.3 | 57.4 |
| Smaller | 21 | 4,199 | 84.0 | 45.7 | 60.2 |
| All Carnegie | 208 | 8,225 | 82.3 | 36.3 | 57.7 |

Data Source: IPEDS Fall Enrollment Survey, 2007-2008

Table 19

A Comparison of the Average Number of Low-income Undergraduate Students and Percentage of Low-income Undergraduate Students Enrolled at Public Master's-level Institutions by Carnegie Classification

| Carnegie | Count | Average Number of Low-income Undergraduates Enrolled | Average Percentage of Low-income Undergraduate Enrollment |
|--------------|-------|------------------------------------------------------|-----------------------------------------------------------|
| Larger | 131 | 2,364 | 24.3 |
| Medium | 56 | 1,351 | 27.0 |
| Smaller | 21 | 1,342 | 35.7 |
| All Carnegie | 208 | 1,988 | 26.2 |

Data Source: Delta Cost Project, 1987-2008 data file

Financial Factors by Campus Setting

The third and final part of the first research question analyzed the variables based on campus setting. Within this designation, 137 institutions were rural (66% of the study population). The rural institutions were the most affordable, presenting a lower COA for both in-state and out-of-state students. The COA at suburban and urban institutions was comparable, with the average in-state rate costing slightly more at suburban campuses and the average out-of-state rate being minimally greater at urban schools. All Pell Grant variables were highest at urban institutions. With 40% of first-time, full-time undergraduates enrolled at urban institutions being Pell Grant recipients, the data may suggest that some correlation exists between low-income level and residing in an urban area or attending an institution in an urban setting.

Urban institutions also enrolled the highest percentage of other Federal grant aid recipients (25.3%). The greatest average award of other Federal grant aid was disbursed at urban institutions as well, but suburban institutions distributed a higher total dollar amount of other Federal grant aid. Urban institutions provided the highest total dollars of state aid to the greatest percentage of state aid recipients (43.2%). Urban public master's-level institutions also had the highest number of state aid recipients, but suburban institutions offered the greatest average state aid award. Tables 20, 21, 22, and 23 present the disaggregated averages for the in-state and out-of-state cost of attendance as well as the averages for various Federal and state financial aid awards for the 208 institutions included in the present study.

Table 20

A Comparison of the Average Total COA for In-state and Out-of-state On-campus Undergraduate Students Enrolled in Public Master's-level Institutions by Campus Setting

| Setting | Count | Average Total Cost of Attendance, In-State | Average Total Cost of Attendance, Out-of-State |
|--------------|-------|--------------------------------------------|------------------------------------------------|
| Rural | 137 | 15,230 | 22,190 |
| Suburban | 41 | 17,414 | 25,013 |
| Urban | 30 | 17,194 | 25,500 |
| All Settings | 208 | 15,944 | 23,224 |

Data Source: IPEDS Institutional Characteristics Survey, 2007-2008

Table 21

A Comparison of the Average Number of Pell Grant Recipients, Pell Grant Award, Percentage of Pell Grant Recipients, and Total Pell Grant Dollars at Public Master's-level Institutions by Campus Setting

| Setting | Count | Average Number Pell Recipients | Average Pell Grant Award | Average % Pell Recipients | Average of Total Pell \$ |
|--------------|-------|--------------------------------|--------------------------|---------------------------|--------------------------|
| Rural | 137 | 368 | 2,977 | 33.6 | 6,259,617 |
| Suburban | 41 | 443 | 3,004 | 27.8 | 8,193,611 |
| Urban | 30 | 584 | 3,207 | 40.0 | 12,753,825 |
| All Settings | 208 | 414 | 3,016 | 33.4 | 7,577,501 |

Data Sources: IPEDS Student Financial Aid Survey and Finance Survey, 2007-2008

Table 22

A Comparison of the Average Number of Other Federal Grant Aid Recipients, Other Federal Grant Aid Award, Percentage of Other Federal Grant Aid Recipients, and Total Other Federal Grant Aid Dollars at Public Master's-level Institutions by Campus Setting

| Setting | Count | Average # Other Federal Grant Aid Recipients | Average Other Federal Grant Aid Award | Average % Other Federal Grant Aid Recipients | Average of Total Other Federal Grant Aid \$ |
|--------------|-------|----------------------------------------------|---------------------------------------|----------------------------------------------|---------------------------------------------|
| Rural | 137 | 240 | 1,029 | 20.3 | 840,801 |
| Suburban | 41 | 320 | 996 | 19.3 | 1,489,561 |
| Urban | 30 | 393 | 1,042 | 25.3 | 1,136,234 |
| All Settings | 208 | 278 | 1,024 | 20.8 | 1,011,292 |

Data Sources: IPEDS Student Financial Aid Survey and Finance Survey, 2007-2008

Table 23

A Comparison of the Average Number of State Aid Recipients, State Aid Award, Percentage of State Aid Recipients, and Total State Aid Dollars at Public Master's-level Institutions by Campus Setting

| Setting | Count | Average # State Aid Recipients | Average State Aid Award | Average % State Aid Recipients | Average of Total State Aid \$ |
|--------------|-------|--------------------------------|-------------------------|--------------------------------|-------------------------------|
| Rural | 137 | 460 | 2,520 | 38.4 | 3,486,968 |
| Suburban | 41 | 645 | 2,966 | 37.9 | 8,192,499 |
| Urban | 30 | 653 | 2,681 | 43.2 | 11,777,206 |
| All Settings | 208 | 524 | 2,631 | 39.0 | 5,610,208 |

Data Sources: IPEDS Student Financial Aid Survey and Finance Survey, 2007-2008

The distribution of total institutional aid and need-based institutional aid was comparable across campus setting, with urban institutions enrolling the greatest number of recipients of institutional aid (30 urban institutions reporting) and also of need-based institutional aid (12 institutions reporting). Moreover, recipients of total institutional aid and need-based institutional aid received the greatest average amount of each award at public master's-level institutions in an urban campus setting. However, the highest percentages of recipients for both total institutional aid (32%) and need-based institutional aid (34.7%) were found at rural institutions, and the most total dollars spent on each type were awarded to undergraduate students enrolled at suburban institutions. Even so, the percentage of institutional aid recipients at rural institutions could be skewed because fewer total need-based institutional funds (\$1.3M) were disbursed to undergraduates enrolled at the most institutions (70), when disaggregated by campus setting. Simultaneously, 12 urban institutions distributed \$1.8M in need-based institutional aid, and 24 suburban institutions spent a grand total of \$2.1M on need-based institutional aid awards.

Non-need-based institutional aid exhibited a different distribution pattern across campus setting. Interestingly, the greatest number of non-need-based institutional aid recipients was enrolled in suburban institutions. Also, the highest average non-need-based institutional aid award and the most total dollars spent on non-need-based institutional aid were observed at public master's-level institutions in a suburban setting.

Tables 24-26 illustrate total institutional aid, need-based institutional aid, and non-need-based institutional aid variable averages, disaggregated by campus setting. Total institutional aid data was obtained from IPEDS, while need-based and non-need-based institutional aid figures were acquired from The College Board. Therefore, the total institutional aid data presented in Table 24 represented all 208 institutions in the study population. However, not all of those

institutions reported data to The College Board via the 2009 *Annual Survey of Colleges*. Thus, only those institutions which reported data regarding need-based institutional aid and non-need-based institutional aid were included in the descriptive analysis of those two financial variables. Those results appear in Tables 25 and 26, respectively.

Table 24

A Comparison of the Average Number of Institutional Aid Recipients, Average Institutional Aid Award, Percentage of Institutional Aid Recipients, and Total Institutional Aid Dollars at Public Master's-level Institutions by Campus Setting

| Setting | Count | Average # Institutional Aid Recipients | Average Institutional Aid Award | Average % Institutional Aid Recipients | Average of Total Institu- tional Aid \$ |
|--------------|-------|----------------------------------------------|---------------------------------------|----------------------------------------------|-----------------------------------------------|
| Rural | 137 | 372 | 2,830 | 32.0 | 5,594,626 |
| Suburban | 41 | 470 | 3,159 | 27.5 | 6,071,877 |
| Urban | 30 | 512 | 3,957 | 31.2 | 5,557,687 |
| All Settings | 208 | 412 | 3,059 | 31.0 | 5,683,372 |

Data Sources: IPEDS Student Financial Aid Survey and Finance Survey, 2007-2008

Table 25

A Comparison of the Average Number of Need-based Institutional Aid Recipients, Average Need-based Institutional Aid Award, Percentage of Need-based Institutional Aid Recipients, and Total Need-based Institutional Aid Dollars at Public Master's-level Institutions by Campus Setting

| Setting | Count | Average # Need-based Institutional Aid Recipients | Average Need- Based Institutional Aid Award | Average % Need-based Institutional Aid Recipients | Average of Total Need-based Institutional Aid \$ |
|--------------|-------|------------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------|--------------------------------------------------------|
| Rural | 70 | 2,492 | 4,586 | 34.7 | 1,395,296 |
| Suburban | 24 | 3,457 | 5,727 | 29.9 | 2,162,753 |
| Urban | 12 | 4,075 | 5,371 | 26.9 | 1,847,623 |
| All Settings | 106 | 2,890 | 4,933 | 32.8 | 1,620,267 |

Data Source: The College Board, Annual Survey of Colleges, 2009

Table 26

A Comparison of the Average Number of Non-need-based Institutional Aid Recipients, Average Non-need-based Institutional Aid Award, Percentage of Non-need-based Institutional Aid Recipients, and Total Non-need-based Institutional Aid Dollars at Public Master's-level Institutions by Campus Setting

| Setting | Count | Average # Recipients Non-need Inst. Aid | Average Non-need- based Institutional Aid Award | Average % Non-need Inst. Aid Recipients | Average of Total Non-need-based Institutional Aid \$ |
|--------------|-------|--------------------------------------------------|-------------------------------------------------------|--------------------------------------------------|------------------------------------------------------------|
| Rural | 75 | 672 | 2,796 | 9.7 | 2,183,114 |
| Suburban | 28 | 730 | 4,299 | 6.6 | 2,263,873 |
| Urban | 11 | 506 | 2,879 | 4.4 | 1,711,786 |
| All Settings | 114 | 670 | 3,173 | 8.4 | 2,157,470 |

Data Source: The College Board, Annual Survey of Colleges, 2009

Institutional Characteristics by Campus Setting

The greatest number of first-time, full-time, undergraduate students was enrolled at institutions in an urban campus setting. However, only 30 urban institutions were included in the study population of 208 institutions; therefore, institutions in this study that were located in urban settings must have a substantially large level of undergraduate enrollment. Additionally, urban institutions in this study demonstrated significantly higher percentages of minority undergraduate enrollment (56.4%). Moreover, the largest number and highest percentage (30.7%) of low-income undergraduate students enrolled in public master’s-level institutions was found at institutions located in an urban campus setting. The enrollment data analyzed in the present study seems to suggest that a correlation may exist among minority status, income level, and attendance at a public master’s-level institution in an urban setting. Tables 27 and 28 present undergraduate enrollment data disaggregated by campus setting.

Table 27

A Comparison of the Average Number of Undergraduate Students, Percentage Full-time Undergraduate Students, Percentage Minority Undergraduate Students, and Percentage Female Undergraduate Students Enrolled at Public Master’s-level Institutions by Campus Setting

| Setting | Count | Average Number Undergraduates Enrolled | Average % Full-time Undergraduates Enrolled | Average % Minority Undergrads Enrolled | Average % Female Undergrads Enrolled |
|--------------|-------|----------------------------------------|---------------------------------------------|----------------------------------------|--------------------------------------|
| Rural | 137 | 6,831 | 83.0 | 32.1 | 57.6 |
| Suburban | 41 | 10,401 | 82.5 | 35.4 | 57.1 |
| Urban | 30 | 11,619 | 78.5 | 56.4 | 59.3 |
| All Settings | 208 | 8,225 | 82.3 | 36.3 | 57.7 |

Data Source: IPEDS Fall Enrollment Survey, 2007-2008

Table 28

A Comparison of the Average Number of Low-income Undergraduate Students and Percentage of Low-income Undergraduate Students Enrolled at Public Master's-level Institutions by Campus Setting

| Setting | Count | Average Number of Low-income Undergraduates Enrolled | Average Percentage of Low-income Undergraduate Enrollment |
|--------------|-------|------------------------------------------------------|-----------------------------------------------------------|
| Rural | 137 | 1,632 | 27.0 |
| Suburban | 41 | 2,154 | 20.3 |
| Urban | 30 | 3,385 | 30.7 |
| All Settings | 208 | 1,988 | 26.2 |

Data Source: Delta Cost Project, 1987-2008 data file

This section presented the results from the descriptive analysis that was conducted to answer Research Question One. Related findings and conclusions are discussed in Chapter Five. The results from Research Question Two are addressed next.

Research Question Two

To what degree does the combination of financial factors and institutional characteristics explain the number of low-income undergraduate students enrolled at public, residential Master's Colleges and Universities in the U.S., which serve primarily full-time undergraduate students?

Once descriptive statistics were calculated to answer Research Question One, a set of independent variables of interest was selected with which to conduct a multiple linear regression analysis. These independent variables (TCOAIS, TCOAOOS, AVGPPELL, NUMFEDGA, AVGFEDGA, NUMSTAID, AVGSTAID, NUMEGENR, FTUGENRP, MINUGENP, FEMUGENP, NUMINSTA, AVGINSTA, REGION, CARNEGIE, and SETTING) had theoretical importance, as connoted by their inclusion in prior research noted in the review of

literature that was conducted as part of this study. Additionally, the selected variables appeared in the descriptive statistical analysis to best define or characterize differences between individual and groups of institutions. NUMPELL was excluded due to the association between Pell eligibility and low-income status.

After conducting multiple linear regression analysis in SPSS[®], the forward method determined that the following five predictor variables – number of undergraduates enrolled (NUMUGENR; $\beta = 0.623$), percentage minority undergraduate enrollment (MINUGENP; $\beta = 0.311$), number of recipients of other Federal grant aid (NUMFEDGA; $\beta = 0.267$), percentage full-time undergraduate enrollment (FTUGENRP; $\beta = -0.153$), and suburban campus setting (CARNEGIE-Suburban; $\beta = -0.088$) – were significant predictors of the criterion variable, total number of low-income undergraduates enrolled in public master's-level institutions (LIUGENT). The first three significant predictor variables listed above had a positive linear relationship with the criterion variable, meaning that as any of those factors increased, then the number of low-income undergraduate students enrolled increased as well. Percentage full-time undergraduate enrollment and also location in a suburban campus setting were correlated negatively with the criterion variable, so as either of these variables increased, the number of low-income undergraduate students enrolled in public master's-level institutions declined.

Assumptions of linearity, normality, and independence proved true, as evidenced by the Normal Probability Plot and all partial subplots that were generated as a result of the regression analysis (see Appendix F). The Variance Inflation Factor (VIF) was checked for each predictor variable included in the final model, and all values were less than 5, which is the acceptable level (Tabachnick & Fidell, 2007). As such, no problems with multicollinearity were associated with the variables included in the final regression model. The adjusted R^2 value was 0.843, indicating

that 84% of the variance in the number of low-income undergraduate students enrolled was explained by this model, $F(5, 202) = 223.094$, $p < .001$. The following independent variables: TCOAIS, TCOAOS, AVGPPELL, AVGFEDGA, NUMSTAID, AVGSTAID, NUMINSTA, AVGINSTA, FEMUGENP, REGION (West, Northeast, and Midwest), CARNEGIE (Medium and Smaller), or SETTING (Urban), were not significant predictors in this model. The model summary is depicted in Table 29, and significant predictor variables are presented in Table 30 below.

Table 29

Regression Model Summary to Predict Total Number of Low-Income Undergraduate Students Enrolled at Public Master's-level Institutions

| Model | R | R ² | Adjusted R ² | SE (estimate) | R ² Change | F Change | df2 | Sig. |
|-------|------|----------------|-------------------------|---------------|-----------------------|----------|-----|------|
| 1 | .806 | .650 | .648 | 886.128 | .650 | 382.902 | 206 | .000 |
| 2 | .893 | .798 | .796 | 674.825 | .148 | 150.204 | 205 | .000 |
| 3 | .904 | .818 | .815 | 643.053 | .019 | 21.758 | 204 | .000 |
| 4 | .916 | .839 | .836 | 605.128 | .022 | 27.372 | 203 | .000 |
| 5 | .920 | .847 | .843 | 592.444 | .007 | 9.785 | 202 | .000 |

1. Predictors: Constant, NUMUGENR
2. Predictors: Constant, NUMEGENR, MINUGENP
3. Predictors: Constant, NUMEGENR, MINUGENP, NUMFEDGA
4. Predictors: Constant, NUMEGENR, MINUGENP, NUMFEDGA, FTUGENRP
5. Predictors: Constant, NUMEGENR, MINUGENP, NUMFEDGA, FTUGENRP, Suburban

Table 30

Significant Predictors of Total Number of Low-Income Undergraduate Students Enrolled at Public Master's-level Institutions

| Predictor Variable | B | SE | β | t | Sig. |
|--------------------|----------|---------|---------|--------|------|
| (Constant) | 1480.939 | 417.883 | | 3.544 | .000 |
| NUMUGENR | 0.171 | 0.012 | 0.623 | 14.144 | .000 |
| MINUGENP | 17.358 | 1.647 | 0.311 | 10.539 | .000 |
| NUMFEDGA | 1.915 | 0.313 | 0.267 | 6.120 | .000 |
| FTUGENRP | -24.284 | 4.709 | -0.153 | -5.157 | .000 |
| SETTING-Suburban | -330.906 | 105.784 | -0.088 | -3.128 | .002 |

Note: $R^2 = .84$; $F(5, 202) = 223.094$, $p < .001$

This section presented the results from the multiple linear regression analysis that was conducted to answer Research Question Two. Subsequent findings and conclusions related to these results are discussed in Chapter Five. The results from Research Question Three are presented next.

Research Question Three

To what degree does the combination of financial factors and institutional characteristics explain the percentage of low-income undergraduate students enrolled at public, residential Master's Colleges and Universities in the U.S., which serve primarily full-time undergraduate students?

A second set of independent variables (TCOAIS, TCOAOOS, AVGPPELL, PCTFEDGA, AVGFEDGA, PCTSTAID, AVGSTAID, PCTINSTA, AVGINSTA, NUMEGENR, FTUGENRP, MINUGENP, FEMUGENP, REGION, CARNEGIE, and SETTING) was selected for inclusion in the multiple linear regression analysis conducted to answer the third research

question. PCTPELL was excluded due to the association between Pell eligibility and low-income status. Conducting this multiple regression analysis in SPSS[®], using the forward method, revealed that the following eight predictor variables – percentage minority undergraduate enrollment (MINUGENP; $\beta = 0.634$), total cost of attendance for out-of-state residents (TCOAOOS; $\beta = -0.171$), suburban campus setting (SETTING-Suburban ; $\beta = -0.091$), percentage recipients of other Federal grant aid (PCTFEDGA; $\beta = 0.137$), Master’s Colleges and Universities-Smaller (CARNEGIE-Smaller; $\beta = 0.094$), percentage full-time undergraduate enrollment (FTUGENRP; $\beta = -0.095$), total number of undergraduates enrolled (NUMUGENR; $\beta = -0.124$), and Northeast geographic region (REGION-Northeast; $\beta = -0.097$) – emerged as significant predictors of the criterion variable, percentage low-income undergraduate enrollment at public master’s-level institutions (LIUGENP). The percentage of minority undergraduate enrollment, percentage of recipients of other Federal grant aid, and classification as Master’s-Smaller were correlated positively with the criterion variable, meaning that as any of these predictor variables increased, so did the percentage of low-income undergraduate enrollment. The total cost of attendance for out-of-state residents, the total number of undergraduates enrolled, location in the Northeast region, percentage full-time undergraduate enrollment, and location in a suburban campus setting were correlated negatively with the criterion variable, indicating that as any of these variables increased, the percentage of low-income undergraduate enrollment in public master’s-level institutions declined.

Assumptions of linearity, normality, and independence proved true, as evidenced by the Normal Probability Plot and all partial subplots that were generated as a result of the regression analysis (see Appendix F). The VIF was checked for each predictor variable included in the final model, and all values were less than 5, which is an acceptable level (Tabachnick & Fidell,

2007). No problems with multicollinearity were associated with the variables included in the final regression model. The adjusted R^2 value was 0.680, indicating that 68% of the variance in the percentage low-income undergraduate enrollment was explained by this model, $F(8, 199) = 55.991$, $p < .001$. The following independent variables: TCOAIS, AVGPPELL, AVGFEDGA, PCTSTAID, AVGSTAID, PCTINSTA, AVGINSTA, FEMUGENP, REGION-West, REGION-Midwest, CARNEGIE-Medium, and SETTING-Urban were not significant predictors in this model. The model summary is depicted in Table 31, and significant variables are presented in Table 32.

Table 31

Regression Model Summary to Predict Percentage of Low-Income Undergraduate Enrollment at Public Master's-level Institutions

| Model | R | R^2 | Adjusted R^2 | SE (estimate) | R^2 Change | F Change | df2 | Sig. |
|-------|------|-------|----------------|---------------|--------------|----------|-----|------|
| 1 | .737 | .543 | .540 | 9.118 | .543 | 244.382 | 206 | .000 |
| 2 | .792 | .627 | .623 | 8.257 | .084 | 46.194 | 205 | .000 |
| 3 | .805 | .647 | .642 | 8.045 | .021 | 11.960 | 204 | .000 |
| 4 | .812 | .660 | .653 | 7.925 | .012 | 7.242 | 203 | .000 |
| 5 | .818 | .669 | .661 | 7.835 | .009 | 5.656 | 202 | .000 |
| 6 | .823 | .677 | .668 | 7.755 | .008 | 5.230 | 201 | .000 |
| 7 | .828 | .685 | .674 | 7.677 | .008 | 5.112 | 200 | .000 |
| 8 | .832 | .692 | .680 | 7.608 | .007 | 4.614 | 199 | .000 |

1. Predictors: Constant, MINUGENP
2. Predictors: Constant, MINUGENP, TCOAOOS
3. Predictors: Constant, MINUGENP, TCOAOOS, Suburban
4. Predictors: Constant, MINUGENP, TCOAOOS, Suburban, PCTFEDGA
5. Predictors: Constant, MINUGENP, TCOAOOS, Suburban, PCTFEDGA, Smaller
6. Predictors: Constant, MINUGENP, TCOAOOS, Suburban, PCTFEDGA, Smaller, FTUGENRP
7. Predictors: Constant, MINUGENP, TCOAOOS, Suburban, PCTFEDGA, Smaller, FTUGENRP, NUMUGENR
8. Predictors: Constant, MINUGENP, TCOAOOS, Suburban, PCTFEDGA, Smaller, FTUGENRP, NUMUGENR, Northeast

Table 32

Significant Predictors of Percentage of Low-Income Undergraduate Enrollment at Public Master's-level Institutions

| Predictor Variable | B | SE | β | t | Sig. |
|--------------------|--------|-------|---------|--------|------|
| (Constant) | 39.425 | 5.767 | | 6.837 | .000 |
| MINUGENP | 0.319 | 0.023 | 0.634 | 13.886 | .000 |
| TCOAOOS | -0.001 | 0.000 | -0.171 | -3.889 | .000 |
| PCTFEDGA | 0.174 | 0.056 | 0.137 | 3.129 | .002 |
| NUMUGENR | 0.000 | 0.000 | -0.124 | -2.757 | .006 |
| REGION-Northeast | -3.225 | 1.501 | -0.097 | -2.148 | .033 |
| FTUGENRP | -0.135 | 0.060 | -0.095 | -2.261 | .025 |
| CARNEGIE-Smaller | 4.199 | 1.835 | 0.094 | 2.289 | .023 |
| SETTING-Suburban | -3.062 | 1.469 | -0.091 | -2.084 | .038 |

Note: $R^2 = .69$; $F(8, 199) = 55.991$, $p < .001$

This section presented the results from the multiple linear regression analysis that was conducted to answer Research Question Three. Related findings and conclusions drawn from these results are offered in Chapter V. Table 32 concludes the presentation of the results included in the present study.

Summary

This chapter presented the results of the data analysis conducted for the present research study, which included both descriptive and inferential statistics. The next chapter provides a summary of these findings as well as conclusions from the present research study. Then, recommendations are offered for policymakers and practitioners and also for future areas of research.

CHAPTER V:

CONCLUSIONS AND RECOMMENDATIONS

Introduction

This final chapter offers a summary of the findings presented in Chapter IV. Then, conclusions drawn from the present research study are discussed, and recommendations are offered for policymakers and practitioners, as well as future researchers exploring this topic. Lastly, this study is concluded with final thoughts from the researcher.

Summary of Findings

Research Question One

Financial Factors. The total cost of in-state attendance was lowest, on average, for institutions in the South and highest for Northeast institutions. However, the greatest average total Pell Grant dollars and also total other Federal grant aid dollars spent per institution were found in the West and South regions, while institutions located in the Northeast awarded, on average, the least total dollars in Pell Grant aid. Institutions in the Midwest disbursed the smallest average total amount, per institution, of state and local aid. Hence, institutions in the South and West appeared most affordable after aid was applied, which could explain, in part, why institutions in these regions also enrolled the highest percentages of low-income undergraduate students (31.4% and 28.9%, respectively).

Regarding institutional aid, the Southern institutions spent, on average, the greatest total dollar amount on institutional aid as well as need-based institutional aid. Institutions in the South also enrolled, on average, the greatest number and percentage of non-need-based

institutional aid recipients (11.3%). However, the Midwestern institutions spent the most total dollars on non-need-based institutional aid. Institutions located in the West maintained the highest percentage of institutional aid recipients (38%), and these institutions also had the highest out-of-state cost of attendance. Northeast institutions enrolled the highest percentage of need-based institutional aid recipients (35.5%) and provided the highest average need-based institutional aid award, but these institutions published the highest average in-state cost of attendance. These incongruities will be explored later in this chapter.

Public master's-level institutions classified by Carnegie as Smaller enrolled the greatest percentage of undergraduates as Pell Grant recipients (44.1%) as well as the highest percentage of undergraduates who were recipients of other Federal grant aid (23.4%). Institutions designated as Smaller also demonstrated the greatest percentage of undergraduate minority enrollment (45.7%) and the highest percentage of low-income undergraduate students enrolled (35.7%). Smaller institutions enrolled the greatest percentage of institutional aid recipients for all aid types (total, need-based, and non-need-based). Disaggregation by Carnegie Classification yielded a better understanding of those master's-level institutions of smaller program size and also illustrated their unique ability to serve the low-income undergraduate student population. No noteworthy distinctions were observed for institutions classified as Medium or Larger.

Sorting the study variables according to campus setting produced several interesting associations. All of the Pell Grant variables were greater at institutions located in an urban campus setting. Forty percent of undergraduates enrolled in the urban institutions included in this study were Pell Grant recipients, and Pell Grant eligibility serves as a proxy for low-income status (St. John, 2003). The COA at urban institutions was considerably higher than the COA at rural institutions; however, enrollment levels of low-income undergraduate students and also

minority undergraduate students were significantly greater at urban institutions, as compared to those located in a rural campus setting.

The highest numbers of institutional aid recipients and need-based institutional aid recipients were enrolled at urban institutions. Institutions located in an urban setting also provided the largest average institutional aid award, while spending the fewest average total dollars on institutional aid. Suburban institutions, on average, spent the most total dollars on institutional aid and also on need-based institutional aid, providing an above average number of institutional aid recipients with above average institutional aid award amounts, as well as providing an above average number of need-based institutional aid recipients with the highest average need-based institutional aid award amount. Institutions located in a rural setting maintained the greatest percentage of their undergraduate enrollment as institutional aid recipients (32%) as well as need-based institutional aid recipients (34.7%), which was interesting since rural institutions enrolled the fewest average number of recipients for each aid type and also provided the smallest average award amount for each aid type. However, this apparent contradiction is logical, given that rural institutions also maintained the lowest undergraduate enrollment numbers, when compared to suburban and urban institutions in the present study.

A distinct relationship emerged between the non-need-based institutional aid variables and institutions located in a suburban campus setting. Suburban institutions provided the greatest average non-need-based institutional aid awards to the highest average number of undergraduates enrolled. Also, institutions located in a suburban campus setting spent the most total dollars, per institution, on non-need-based, or merit-based, institutional aid. The fact that non-need-based institutional aid appears strongly related to enrollment at suburban institutions is worrisome for low-income students, whose opportunities to enroll in suburban institutions may

be limited by such an institutional aid strategy. This incongruence will be explored further in the Recommendations section below.

Institutional Characteristics. By far, the Western institutions included in this study enrolled, on average, the largest number of low-income undergraduate students, but it should be noted that total undergraduate enrollment at institutions located in the West region was significantly larger than the average total undergraduate enrollment numbers at institutions in each of the other three geographic regions. A majority of the institutions were located in the South region, but the greatest numbers of undergraduate students were enrolled in fewer institutions located in the West, meaning that Western institutions maintained larger total undergraduate enrollment numbers, on average.

As Table 9 illustrated, the percentage of female undergraduate enrollment, disaggregated by geographic region, was fairly consistent across institutions in this study. Minority undergraduate enrollment was split, with significantly higher percentages of minorities enrolled at institutions in the South (43.6%) and West (49%) and fewer minorities enrolled in the Midwest (20%) and Northeast (26.1%). In fact, the Northeast region was determined to have enrolled the fewest minority undergraduates of all, when that region's average percentage of minority enrollment was multiplied by a lower average number of undergraduate students (6,568) enrolled at institutions in that region. The percentage of full-time undergraduate enrollment in the Northeast (86.8%) was notably higher than in the other geographic regions, while the total number of undergraduate students enrolled in public master's-level institutions in the West region was drastically greater than at institutions in the other geographic regions included in this study. As noted in the literature review, the West and South geographic regions

are experiencing diverse population growth at present (Gohn & Albin, 2006), so these findings were not surprising.

Low-income undergraduate enrollment at urban institutions comprised 30.7% of the total undergraduate population. Even more noteworthy about the urban institutions was the large number of low-income undergraduate students enrolled. The percentage of minority undergraduate enrollment at institutions located in an urban campus setting (56.4%) was drastically larger than in the suburban (35.4%) or rural (32.1%) settings. This anomaly will be addressed further in the Conclusions and Recommendations sections below.

Reviewing institutions holistically according to geographic region revealed distinct financial and institutional patterns for each area of the U.S. Included in this study were 88 institutions located in the South region, which served as the reference group in the regression analyses. Southern institutions presented the lowest average COA for both in-state and out-of-state residents. Also, institutions located in the South maintained the highest average percentage of undergraduates as Pell Grant recipients and an above average percentage of other Federal grant aid recipients. Southern institutions also enrolled the highest number of state aid recipients, on average. These institutions provided the highest average institutional aid award and spent the highest average total dollars, per institution, on institutional aid. Southern institutions also spent the highest average total dollars on need-based institutional aid while enrolling the highest average number and highest percentage of recipients of non-need-based institutional aid. Public master's-level institutions located in the South region had the highest percentage of female undergraduates enrolled (59.1%), the second highest percentage of minority undergraduate enrollment (43.6%), and the highest average percentage of low-income undergraduate enrollment (31.4%) in the 2007-2008 academic year.

Institutions located in the West region were determined to have the largest average undergraduate enrollment numbers (12,086) in the fewest number of institutions (36), compared to the other three geographic regions. Western institutions presented an above average in-state cost of attendance and the highest average out-of-state cost of attendance. Institutions located in the West also enrolled the highest average number of Pell Grant recipients and the highest average Pell Grant award, and these institutions spent greatest average total dollars, per institution, on Pell Grant aid. Western institutions enrolled the highest number and greatest percentage of recipients of other Federal grant aid (22.1%) and spent the highest average total dollars, per institution, on other Federal grant aid. These institutions also spent the highest average total dollars on state aid but provided the smallest average state aid award. The highest average number and percentage of recipients of institutional aid (38%) were enrolled in institutions located in the West region. Also, the highest average number of need-based institutional aid recipients was enrolled in this region. Western institutions provided the lowest average non-need-based institutional aid award to the lowest percentage of recipients of non-need-based institutional aid (3.5%), and these institutions spent the fewest total dollars, per institution, on non-need-based institutional aid. The highest average minority undergraduate enrollment percentage (49%) and the highest average number of low-income undergraduates enrolled were found at public master's-level institutions located in the West region.

The Midwest region included 41 institutions from the study population. Institutions located in this region presented an average in-state cost of attendance and a below average out-of-state COA. Midwestern institutions provided the lowest average Pell Grant award to the lowest average percentage of Pell Grant recipients (27.7%). However, Midwestern institutions provided the highest average other Federal grant aid award. Regarding state aid, institutions in

the Midwest region provided a below average state aid award to the lowest average percentage of state aid recipients (31.5%). Also, institutions in this region spent the lowest average total dollars, per institution, on state aid. Midwestern institutions maintained an above average number and percentage of institutional aid recipients (35.4%) and spent an above average amount of total dollars on institutional aid. Institutions in this region provided the lowest average need-based institutional aid award to the lowest average percentage of need-based institutional aid recipients (27.8%). Institutions in the Midwest region enrolled an above average number and percentage of recipients of non-need-based institutional aid (8.7%) and spent the highest average total dollars spent, per institution, on non-need-based institutional aid. An above average number of undergraduates were found to be enrolled in public master's-level institutions located in the Midwest region, and these institutions demonstrated an above average percentage of full-time undergraduate enrollment (82.7%). The lowest average percentage of minority undergraduates enrolled (20%) and lowest average percentage of female undergraduates enrolled (55.4%) were observed at institutions located in the Midwest, and these institutions also enrolled a below average number and percentage of low-income undergraduate students (20.5%).

In the present study, 43 institutions were located in the Northeast geographic region. These institutions present the highest average in-state COA and an above average out-of-state COA. Northeast institutions enrolled the fewest number of Pell Grant recipients and spent the lowest average total dollars, per institution, on Pell Grant aid. The fewest number of other Federal grant aid recipients were enrolled at institutions in this region. The lowest number, but highest percentage (43.3%), of state aid recipients were enrolled at institutions located in the Northeast, and these institutions provided the highest average state aid award. Northeastern institutions enrolled the lowest average number and percentage (23.4%) of institutional aid

recipients, provided the smallest average institutional aid award, and spent the fewest average total dollars, per institution, on institutional aid. Institutions in this region enrolled the lowest number but the highest percentage (35.5%) of need-based institutional aid recipients and provided the highest average need-based institutional aid award. Northeast institutions enrolled the lowest number of recipients of non-need-based institutional aid but provided the highest average non-need-based institutional aid award. These institutions had the lowest average number of undergraduates enrolled but maintained the highest average percentage of full-time enrollment (86.8%). A below average percentage of minority undergraduate enrollment (26.1%) as well as the lowest average number and percentage of low-income undergraduate students (18.7%) were enrolled at public master's-level institutions located in the Northeast region.

Hence, institutions in the South and West were similar according to many of the variables included in this study. Institutions located in the South and West geographic regions seemed more affordable, on average, after aid was applied to the total cost of attendance. A substantial portion of undergraduates at Southern institutions were recipients of Pell Grant aid, other Federal grant aid, and state aid, which served to reduce the cost of attendance borne by the student. Institutions in the West presented a significantly higher cost of attendance compared to institutions in the South, but the Western institutions spent the greatest total dollars on Pell Grant aid, other Federal grant aid, and state aid. The high levels of grant aid provided by institutions located in the West helped to offset their higher cost of attendance. As such, those institutions included in this study which were located in the South or West regions appeared the most affordable. Therefore, the fact that the highest levels of minority and also low-income undergraduate students were enrolled at public master's-level institutions located in these two regions was understandable.

Institutions located in the Midwest and Northeast shared common patterns across financial factors and institutional characteristics, which differed from the patterns observed in the South and West regions. Institutions in the Midwest and Northeast regions maintained above average levels of full-time enrollment when compared to institutions in the South or West. Midwestern institutions presented an average cost of attendance but did not leverage Federal or state grant aid in the same manner as Southern or Western institutions. Institutions in the Midwest appeared to be utilizing total institutional aid and also non-need-based institutional aid to attract undergraduate students. Similarly, institutions in the Northeast did not employ Federal grant aid to offset their high cost of attendance; however, institutions in this region used state aid successfully to attract and enroll undergraduate students. Additionally, Northeastern institutions utilized the highest average need-based and non-need-based institutional aid awards to recruit students. Public master's-level institutions located in the Midwest and Northeast maintained the lowest levels of minority and low-income undergraduate enrollment.

Research Questions Two and Three

The study population was based primarily on data reported to IPEDS, for which 208 institutions provided complete data records. However, fewer institutions reported data to The College Board regarding need-based and non-need-based institutional aid. Only 106 institutions reported all related data (number of aid recipients, average aid award, percentage of aid recipients, and total aid dollars) regarding need-based institutional aid, and 114 institutions reported all related data concerning non-need-based institutional aid. Merely 95 institutions reported all data related to both need-based and non-need-based institutional aid. Therefore, the variables related to need-based and non-need-based institutional aid were included in the descriptive analysis but excluded from the multiple linear regression analyses executed to answer

Research Questions Two and Three. The need-based and non-need-based institutional aid data acquired from The College Board was based on total undergraduate enrollment, while the IPEDS data was based on the cohort of first-time, full-time, degree-seeking undergraduates enrolled. The varying size of the undergraduate enrollment being analyzed should be acknowledged when reviewing the research results comprehensively.

Student percentages, as opposed to the number of students, seemed more meaningful in this analysis, since the study population varied widely in terms of institutional size. One exception was found in Table 9, where the Northeast institutions appeared to have a higher minority undergraduate enrollment than the Midwest, when considering percentages, but actually the Midwest institutions enrolled a greater number of minority students. This discrepancy resulted from the fact that institutions in the Midwest were slightly larger, on average, in terms of total undergraduate enrollment. Also, institutions in the South enrolled a higher percentage, but a lower number, of low-income undergraduate students when compared to the West; yet, institutions located in the West were appreciably larger in terms of total undergraduate enrollment. Thus, it remains imperative to consider the total context for each institution before making conclusions or generalizations. Even so, employing percentages allowed comparisons to be made across institutions of varying size and was useful in the present research study.

The total number of low-income undergraduate students enrolled (criterion variable) was explained by the following predictor variables, in order of importance: number of undergraduate students enrolled, percentage of minority undergraduate enrollment, number of recipients of other Federal grant aid, percentage of full-time undergraduate enrollment, and suburban campus setting. These five predictor variables were significant in explaining 84% of the variance in the criterion variable, at the .000 level, with 99% confidence in the results ($p < .001$). The total

number of undergraduates enrolled was most significant in explaining the number of low-income undergraduates enrolled, with an R^2 change of 0.65. The first three predictor variables listed above were correlated positively with the number of low-income undergraduate students enrolled. The percentage of full-time undergraduate enrollment and location in a suburban campus setting were correlated negatively with this criterion variable, meaning that as either of these two predictor variables increased, the number of low-income undergraduate students enrolled declined. A statistically significant model emerged from this multiple regression analysis: $F(5, 202) = 223.094, p < .001$.

The percentage low-income undergraduate enrollment (criterion variable) was explained by the following predictor variables, in order of importance: percentage minority undergraduate enrollment, total cost of attendance for out-of-state residents, percentage recipients of other Federal grant aid, total number of undergraduates enrolled, location in the Northeast geographic region, percentage full-time undergraduate enrollment, classification as Master's Colleges and Universities-Smaller, and suburban campus setting. These eight predictor variables were significant in explaining 68% of the variance in the criterion variable, at the .000 level, with 99% confidence in the results ($p < .001$). The percentage of minority undergraduate enrollment was most significant in explaining the percentage of low-income undergraduate enrollment, with an R^2 change of 0.54. These predictor variables – percentage minority undergraduate enrollment, percentage other Federal grant aid recipients, and Carnegie-Smaller – were correlated positively with the percentage of low-income undergraduate enrollment. The total out-of-state cost of attendance, total number of undergraduates enrolled, Northeast geographic region, percentage full-time undergraduate enrollment, and suburban campus setting were all correlated negatively with the criterion variable, meaning that as any of these predictor variables increased, the

percentage of low-income undergraduate enrollment decreased. A statistically significant model emerged from this multiple regression analysis: $F(8, 199) = 55.991, p < .001$. Perhaps influencing the percentage of low-income undergraduate enrollment would be easier for the public master's-level institutions included in this study, since eight predictor variables emerged as significant in explaining the variance in this criterion variable.

This section offered a summary of the findings that resulted from the descriptive and inferential statistical analyses that were conducted to answer the three research questions posed in the present study. Many findings were significant, and a number of practical conclusions may be drawn. Hence, several conclusive statements are offered in the next section.

Conclusions

Based on the findings in the present study, several conclusions were reached. Each conclusion statement is presented below, followed by a brief discussion. These conclusions serve as the basis for the recommendations presented in the next section.

Conclusion One

Institutional aid distribution is correlated with undergraduate enrollment at public master's-level institutions located in the South region and also at public master's-level institutions classified by Carnegie as Smaller. Need-based institutional aid and non-need-based institutional aid appear to impact low-income undergraduate enrollment differently.

Public master's-level institutions located in the South region, on average, enrolled both the highest number and greatest percentage of non-need-based institutional aid recipients. At the same time, as noted in the literature review, many Southern states (FL, GA, SC, and TN) maintain merit-based state aid programs, or education lotteries. Distribution of need-based and non-need-based institutional aid, with respect to average award amounts and also the percentage

of recipients, followed a similar pattern across Carnegie Classification program size. Master's-level institutions of smaller program size provided greater amounts of need-based and non-need-based institutional aid and demonstrated a higher percentage of recipients for each type of institutional aid. These institutions also enrolled the greatest percentages of minority and low-income undergraduate students. Thus, smaller, public master's-level institutions included in the present study appeared to be leveraging institutional aid most effectively, in order to enroll low-income undergraduate students.

Conclusion Two

Income level and minority status appear correlated for undergraduate students enrolled at public master's-level institutions classified by Carnegie as Smaller.

Public master's-level institutions classified as Smaller enrolled a significantly greater percentage of low-income undergraduate students in the 2007-2008 academic year. Perhaps this high rate of enrollment of low-income undergraduate students was correlated with the extremely high rate of minority undergraduate students enrolled at master's-level institutions classified as Smaller during the same year as well. Many Historically Black Colleges and Universities (HBCUs) were included in the Master's Colleges and Universities-Smaller category. Hence, the high minority undergraduate enrollment rate may be accounted for partially by the HBCUs included in the present study population. Even so, the percentage minority undergraduate enrollment predictor variable was significant in both regression models. This relationship between low-income level and minority status among undergraduate students enrolled in public master's-level institutions deserves additional consideration beyond the scope of this study.

Conclusion Three

Urban public master's-level institutions enrolled the greatest percentage of minority undergraduate students as well as the highest number and percentage of low-income undergraduate students.

The minority undergraduate enrollment percentage was greatest at institutions located in an urban campus setting (56.4%). Likewise, both the number and percentage (30.7%) of low-income undergraduate enrollment were highest at urban institutions. However, on average, the urban institutions cost about \$2,000-\$3,000 more to attend than did the rural institutions included in the present study. The COA for urban and suburban institutions was similar, but location in the suburban campus setting was negatively related to low-income undergraduate enrollment in both regression models. Far fewer minority and low-income students attended suburban institutions, as compared to institutions located in an urban setting, which may reflect the demographic reality of the population differences in suburban and urban settings.

Conclusion Four

Numerous factors may be interacting to influence low-income undergraduate enrollment in public master's-level institutions.

Multiple linear regression conducted for each of the criterion variables related to low-income undergraduate enrollment in public master's-level institutions yielded a number of significant explanatory variables, suggesting that several factors may be interacting to influence low-income undergraduate students to enroll (or not enroll). Institutions that desire to increase the number of low-income undergraduate students enrolled have several options. Mainly, focusing their recruiting efforts to increase the total number of undergraduates enrolled and also the percentage of minority undergraduate students enrolled may yield a higher number of low-

income undergraduate students enrolled as well. Moreover, identifying low-income applicants early and assisting them with completing the FAFSA may increase the number of Pell Grant recipients enrolled. If these applicants are awarded a Pell Grant, and possibly a supplemental Federal need-based grant as well, then they are more likely to enroll in a four-year college, since the higher cost of attendance will be offset by the grant aid and will become more affordable to low-income students as a result.

Conclusion Five

Pell Grant recipient numbers are highly consistent with low-income undergraduate enrollment numbers, as expected. Since average Pell Grant award amounts were comparable across program size, the Pell Grant program appears to be working as designed.

The Pell Grant program exists in order to make college more affordable by aiding those students who otherwise would not be able to afford college. Therefore, the correlation between the number of Pell Grant recipients and the number of low-income undergraduate students enrolled in public master's-level institutions is reasonable. As the literature explained, the cost of attendance does not matter if grant aid does not cover this cost or reduce the cost to a level which the student can afford (Heller, 1997; Kim et al., 2009; Paulsen & St. John, 2002; St. John, 2003). If low-income students cannot afford the rising cost of attendance for higher education, then they do not attend.

The findings and conclusions of the current study, when reviewed holistically, reveal interesting patterns regarding low-income undergraduate enrollment in public master's-level institutions across geographic region, Carnegie Classification, and campus setting. Based on these findings, the researcher has concluded that larger, rural, public master's-level institutions were least effective at enrolling low-income undergraduate students during the 2007-2008

academic year under study. However, location in a suburban campus setting was correlated negatively to the enrollment of low-income undergraduate students in both regression models as well. Moreover, institutions located in the Northeast maintained the lowest percentage of low-income undergraduate enrollment (18.7%) and also the lowest average number of low-income undergraduate students enrolled.

Urban, smaller, public master's-level institutions were most effective at enrolling low-income undergraduate students in the 2007-2008 academic year under study. The urban institutions included in this study enrolled the highest number of low-income undergraduate students and also maintained the greatest percentage of low-income undergraduate enrollment (30.7%). Smaller institutions maintained the greatest percentage of low-income undergraduate enrollment (35.7%), while institutions classified by Carnegie as Larger enrolled the greatest number of low-income undergraduates. However, the latter relationship is misleading because enrolling more total students yields a greater likelihood that an institution will have more low-income students. Institutions located in the West enrolled the highest number of low-income undergraduate students, on average, while Southern institutions maintained the largest average percentage of low-income undergraduate enrollment (31.4%).

This section offered several conclusions based on the findings that emerged from the analyses of the data tested in the present research study. Some of the most notable findings from the analyses were transformed into conclusive statements in this section. In the hope that these conclusions will be applied to practice, several useful recommendations are offered in the next two sections for policymakers, practitioners, and future researchers seeking to build upon the present study.

Recommendations for Policymakers and Practitioners

Based on the findings and conclusions of the present study, the following practical recommendations are offered for policymakers and practitioners.

Recommendation One

The researcher recommends that IPEDS starts to collect institutional aid data disaggregated by need and non-need in the Student Financial Aid Survey and the Finance Survey.

This recommendation, related to The College Board data set, is for IPEDS to start collecting institutional aid data based on the need-based or non-need-based categories, rather than continuing to lump both forms of institutional aid together. The fact that so many institutions failed to report information to The College Board regarding need-based and non-need-based institutional aid remains troublesome. If IPEDS required institutional aid data in such a disaggregated format, perhaps better data would be obtained from the participating institutions because institutions face a financial penalty for failing to provide information requested by IPEDS. Since The College Board cannot penalize institutions for omitting requested data, IPEDS is in a better position to make such a request. If the shift from need-based to merit aid is occurring and is adversely affecting low-income undergraduate enrollment (Doyle et al., 2009; Schmidt, 2009), then disaggregating institutional aid according to need or non-need is imperative in order to see clearly how institutions are distributing these funds.

This recommendation is important, since the quality of the data acquired from The College Board posed a limitation to this study. According to The College Board (2010b), a student must apply for financial aid and be determined to have financial need in order to receive need-based aid. However, the *Annual Survey of Colleges* seemingly considers financial need and

non-need as mutually exclusive. If financial aid applicants are determined to have need but receive a non-need-based award, then that award also would be counted as need-based because ultimately the money was used to meet the student's financial need. Therefore, institutional aid that was classified as non-need-based but was used to meet a student's financial need was reported as need-based on the ASC. When reporting non-need-based institutional aid amounts, ASC respondents are advised to report on the number of degree-seeking, undergraduate students who demonstrated no financial need and were awarded institutional non-need-based aid, excluding athletic awards and tuition waivers. Those two awards are reported separately on the ASC. Hence, the reporting procedures on this survey are confusing at best. Even so, this data set provided some insight into the discrepancies between need-based and non-need-based institutional aid distribution, particularly according to geographic region and campus setting, so its inclusion in the present research study was warranted.

Recommendation Two

The Federal Government needs to revise the formula used by the FAFSA to determine a student's financial need. Likewise, public institutions should be mindful of how they determine financial need, and administrators concerned with increasing low-income undergraduate enrollment ought to maintain a reasonable cost of attendance for undergraduate students from throughout their state and region.

The IHEP (2002) report called for a reworking of the faulty formula used to determine need, which currently calculates need based on institution price instead of the student's economic status or income level. Based on this study's findings related to the cost of attendance, need-based aid, and low-income undergraduate enrollment, this recommendation by IHEP is justifiable. Public master's-level institutions located in the Northeast offered the largest average

need-based institutional award and also enrolled the highest percentage of need-based institutional aid recipients. However, these institutions also maintained the highest total COA for in-state students and above average COA for out-of-state residents. Institutions located in the Northeast region also were the least successful at enrolling a substantial percentage of low-income undergraduate students. The Northeast predictor variable was significant, but negative, in explaining the percentage of low-income undergraduate enrollment at public master's-level institutions in this region.

Moreover, the total cost of attendance for out-of-state residents was a significant predictor variable in the second regression model, which explained the variance in the criterion variable, percentage of low-income undergraduate enrollment at public master's-level institutions. Therefore, administrators may want to consider offering a sliding scale tuition rate to applicants, based on their income level. Such an action might enable these public institutions to serve more low-income students throughout their geographic region, particularly if the residents of the state in which they are established do not fall into the low-income category as often.

Policymakers need to investigate the way financial need is being determined and also how need-based aid is being allocated, to ensure that those undergraduate students who demonstrate actual financial need (based on their income level) are receiving need-based aid awards that are intended to help improve the affordability of public master's-level institutions. Moreover, financial aid officers should provide guidance to students to ensure that the FAFSA is completed accurately and submitted on time, to reflect their actual financial need and to guarantee their consideration for all possible awards. As Choy (1999) found, many low-income students continue to demonstrate need after financial aid has been applied.

Recommendation Three

The Federal Government needs to increase funding for the Pell Grant and other Federal grant aid, so that the average award amounts are higher and will cover a greater proportion of the cost of attendance at a public, four-year institution.

Both the number and percentage of other Federal grant aid recipients were significant predictors in the regression models (Tables 30 and 32, respectively). Policymakers should take note of the significance of each predictor variable, in relation to the criterion variable, the number or percentage of low-income undergraduate students enrolled at public master's-level institutions. Additionally, the maximum Pell Grant award must be increased to keep pace with the rising cost of attendance for public higher education. Again, if the amount of need-based grant aid does not cover a sufficient portion of the total cost of attendance, low-income students will choose not to attend the institution.

Recommendation Four

Enrollment managers at public master's-level institutions located in rural and suburban campus setting should review the enrollment strategies being implemented at urban institutions, if they desire to increase low-income undergraduate enrollment.

Urban institutions included in the present study were most effective at enrolling low-income undergraduate students, even with an above average cost of attendance, compared to institutions located in rural or suburban settings. The average Pell Grant award, other Federal grant award, and institutional aid award were all highest at urban institutions. Practitioners in rural or suburban settings may wish to consider various actions that their institutions may take in order to modify the cost of attendance, aid distribution, or on-campus experience to better reflect

student experiences at urban institutions, in order to increase their own low-income undergraduate enrollment figures.

Recommendation Five

Enrollment managers at public master's-level institutions seeking to increase low-income and minority undergraduate enrollment should revisit their institutional mission and strive to enroll more residents of the state and region where the institution is located, particularly by regulating the cost of attendance and employing need-based institutional aid as necessary to fulfill the institutional mission.

The average dollar amount of an institutional aid award (need-based and non-need-based) was highest at institutions classified by Carnegie as Smaller. Additionally, the highest average institutional aid award amount was found at institutions located in an urban campus setting. As noted previously, smaller, urban institutions were most effective at enrolling low-income undergraduate students during the academic year under study. Thus, institutional aid, in its various forms, appears positively correlated to low-income undergraduate enrollment. As such, enrollment managers may be able to identify and disburse a specific award amount in order to encourage a particular group to enroll in their institution. However, the allocation of institutional aid funds, as either need-based or merit-based awards, should work in congruence with the institutional mission.

Recommendations for Future Research

Based on the findings and conclusions of the present study, the following recommendations are offered for future researchers.

Recommendation One

These research questions, posed in The College Board's 2006 report on tuition discounting, deserve legitimate attention by future researchers, based on the results of the present study. They are as follows:

- 1) Is access to public higher education enhanced or diminished by institutional aid policies (The College Board, 2006, p. 9);
- 2) What would the composition of the enrollment at public colleges look like if all of the grant aid were need-based (The College Board, 2006, p. 9); and
- 3) Are tuition discounting policies at public colleges and universities consistent with their missions (The College Board, 2006, p. 9)?

Future research will need to examine institutional aid policies through the qualitative research methods of document analysis and individual interviews, perhaps sharing the findings from the present study to inform practitioners. It is this researcher's hope that policymakers and practitioners will utilize the findings presented in this study to inform future decisions on funding or reorganizing their grant aid programs in order to improve access and affordability in higher education.

Recommendation Two

Future research needs to explore reasons why the highest number and greatest percentage of low-income undergraduate students were enrolled at public master's-level institutions located in an urban campus setting during the academic year under review in this study and determine if this pattern is consistent in other academic years.

The total COA at urban institutions was comparable to that of suburban institutions and higher than the COA at rural institutions. However, rural and suburban institutions enrolled a

substantially lower percentage of both low-income undergraduate students and minority undergraduate students, compared to urban institutions. Additional research may yield explanations for the apparent correlation between income level, minority status, and the campus setting chosen by undergraduate students. Low-income and minority undergraduate students could be interviewed, either individually or in a focus group, to glean a better understanding of why these students chose to enroll in an institution located in an urban campus setting more often. Further, if low-income undergraduate students appear to be attracted to public master's-level institutions in an urban campus setting, future research might employ qualitative methods to explore what else urban institutions may do in order to recruit and retain a substantial low-income undergraduate enrollment population.

Recommendation Three

Explore the relationship between non-need-based institutional aid and undergraduate enrollment at public master's-level institutions located in a suburban setting.

Another area that warrants additional research is the correlation between non-need-based institutional aid and public master's-level institutions located in a suburban campus setting. More research is needed to understand why need-based institutional aid and non-need-based institutional aid did not follow a similar distribution across institutions located in different campus settings. Interviewing enrollment managers at institutions located in each campus setting may uncover reasonable explanations for the differing institutional aid distribution practices. Qualitative research may yield insight into the decision-making process followed by college-bound students as well. Possibly, future research will determine that more undergraduate students drawn to a suburban campus setting also possess a special talent, which qualifies them

to receive non-need-based, or merit-based, institutional aid. Suburban institutions presented an above average COA, so providing above average institutional aid awards may be reasonable.

However, when comparing institutions located in an urban or suburban setting, discrepancies emerged related to need-based and non-need-based institutional aid distribution. Urban institutions provided slightly more undergraduate students with a smaller average need-based institutional aid award, while suburban institutions provided a slightly larger average need-based institutional aid award to fewer undergraduate students. Conversely, suburban institutions awarded the most undergraduate students the largest average non-need-based institutional aid award, while urban institutions awarded a below average non-need-based institutional aid award to a below average number of recipients. Future research should explore which institutional aid disbursement strategy is most effective at enrolling low-income undergraduate students in public, master's-level institutions.

Recommendation Four

Investigate why public-master's-level institutions located in the Midwest region allocated the most total dollars to non-need-based institutional aid in the 2007-2008 academic year, ascertain if a similar allocation of funds occurred in other academic years, and determine if this practice is consistent with their institutional mission as a public college or university.

Institutions in the Midwest region provided the highest total dollar amount of non-need-based institutional aid, and notably, some institutions located in this region have the tendency to enroll out-of-state undergraduate students (Rizzo & Ehrenberg, 2004). Future research may utilize a qualitative method to discuss this practice with enrollment managers at Midwestern institutions, to determine the rationale behind such a strategy and also to learn how this approach

fits into the institutional mission of these public institutions. To complement interview responses, document analysis of the institutional mission statements may be employed as well.

Recommendation Five

Researchers seeking to build on the present study may explore reasons why the Southern institutions included in this study enrolled more non-need-based institutional aid recipients than any other region during the 2007-2008 academic year and determine what relationship, if any, exists among non-need-based institutional aid funds, institutional endowments, and levels of alumni support at institutions located in the South region.

Public institutions in the South may have an older history, at least when compared to institutions located in the West, and therefore, their endowments or levels of alumni support might be substantially larger. With a greater pool of financial resources, Southern colleges and universities may be leveraging this money to attract meritorious students who will increase the institution's prestige. Therefore, future qualitative research may explore the nature of the endowments at colleges and universities located in the South region, considering the age of the endowment, the size of the endowment, the age of the institution, and the relationship between the endowment and disbursement of institutional aid funds.

Alternately, public institutions in the South might be emulating the behavior of their respective state governments, distributing institutional aid in the same manner by which state aid is disbursed. Many Southern states (GA, FL, SC, and TN) maintain educational lotteries, which disburse aid based on merit. Perhaps, enrollment managers at institutions located in the South region are mimicking the behavior of their state legislators by also disbursing institutional aid based primarily on merit instead of on demonstrated financial need. Future quantitative research may explore the linear relationship between state and institutional aid distribution at public

master's-level institutions in the South region. Those results should be shared with enrollment managers so that they may consider the consequences of such an institutional aid policy that aims to reward merit rather than meet financial need.

Recommendation Six

Future research should explore possible explanations for the substantial level of low-income undergraduate enrollment at public master's-level institutions classified by Carnegie as Smaller during the 2007-2008 academic year and determine if the correlation holds true in other academic years.

Master's-level institutions of smaller program size maintained a significantly higher percentage of minority undergraduate students (45.7%) and also the highest percentage of female undergraduate students (60.2%) enrolled. This finding was consistent with the finding by Corrigan (2003) that low-income undergraduate students are more likely to be female and also more likely to be racial/ethnic minorities. Future qualitative research may employ focus group interviews to explore any correlation between minority status and female status of undergraduates enrolled, particularly at smaller, public, master's-level institutions. Researchers building on the present study should conduct individual interviews with admission directors to determine if larger institutions exhibit the tendency to be more selective in admission.

Institutions designated as Smaller also maintained the largest percentage of the undergraduate enrollment as recipients of institutional aid (all types). Furthermore, smaller institutions offered the highest average award amounts for need-based and non-need-based institutional aid. More research is needed to determine the impact of awarding comparable levels of institutional aid at public institutions with medium and larger master's-level programs.

Recommendation Seven

Disaggregate the percentage of minority undergraduate students enrolled according to individual races or ethnicities.

In this study, all non-White undergraduate students were combined in the “minority” undergraduate student variable. Future quantitative researchers may decide to disaggregate minority students according to individual races or ethnicities, in order to glean a superior understanding of these college-going populations. Disaggregating the enrollment results by race/ethnicity for each geographic region would yield an enhanced picture of exactly what type of students are being served by public master’s-level institutions in various geographic regions. Furthermore, determining the racial composition of the college-going subpopulation in each region and comparing that information to the overall population data may uncover additional factors which could encourage or inhibit undergraduate enrollment. Exploring the financial circumstances of residents in each of the four geographic regions may augment the understanding of the population being served by public master’s-level institutions in each area of the U.S. Future researchers may wish to investigate additional financial factors, such as median household income, per capita income, or the poverty rate, in order to appreciate how the college-going subpopulation compares to the overall population residing in each geographic region.

Recommendation Eight

Refine the regression models that were established as a result of the multiple linear regression analyses conducted in the present study.

Future research may build upon the regression models presented in this study, in an attempt to include NUMPELL and PCTPELL but isolate their polarizing effects on the linear regression equations. Future linear regression analyses might employ the Enter method, in order

to withhold these two particular variables from their respective models and determine what other predictor variables may be significant in explaining variance in the criterion variable.

Alternately, all-subsets regression could be conducted in order to consider every possible model for the combination of predictor variables included in the regression analysis, and then the researcher could choose the “best” equation from those results.

Final Thoughts

When the Federal government helps those who cannot afford college, America prospers. Higher education is a means of social mobility (Haveman & Smeeding, 2006; Walpole, 2003). With the decline of Pell Grants and subsequent increasing reliance on loans, college enrollment demographics are changing (Gohn & Albin, 2006; Heller, 1997; Paulsen & St. John, 2002; St. John et al., 2005). Even though individuals are poised to benefit economically by having a degree, America also benefits from having an educated citizenry. Therefore, higher education should not be viewed as a private good but rather as a public commodity, which requires a national investment upfront. America needs a renewed social contract. Based on the findings in the present study, public master’s-level institutions are expected to play an important role in preparing the next generation of college-going students to become future leaders in an ever-changing society.

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APPENDICES

Appendix A Definition of Terms

Access – the number of “overall opportunities to attend college” (St. John, 2003, p. 17). The College Board (2009a) defined access as “expanding a pipeline of qualified and interested students aspiring to pursue postsecondary education – frequently with attention to individuals within groups that have been historically underrepresented” (§ 5).

Affordability – the ability of college-qualified students to pay for the cost of attendance at an institution of higher education (St. John, 2003)

Annual Survey of Colleges – “The Annual Survey of Colleges is a Web-based survey of nearly 4,000 accredited undergraduate colleges and universities in the U.S. The survey collects information of use to high school students, parents, and school counselors about the characteristics of each college including programs, costs, application requirements, and deadlines” (The College Board, 2010b, § 1).

Carnegie Basic Classification – “The Basic Classification is an update of the traditional classification framework developed by the Carnegie Commission on Higher Education in 1970 to support its research program, and later published in 1973 for use by other researchers. Although this classification has undergone many changes over the years, the current release involves some significant changes from previous editions” (The Carnegie Foundation for the Advancement of Teaching, 2010a, § 1).

College Board – “The College Board is a not-for-profit membership association whose mission is to connect students to college success and opportunity. Founded in 1900, the College Board is composed of more than 5,700 schools, colleges, universities and other educational organizations. Each year, the College Board serves seven million students and their parents, 23,000 high schools, and 3,800 colleges through major programs and services in college readiness, college admission, guidance, assessment, financial aid, enrollment, and teaching and learning. Among its best-known programs are the SAT®, the PSAT/NMSQT® and the Advanced Placement Program® (AP®). The College Board is committed to the principles of excellence and equity,

and that commitment is embodied in all of its programs, services, activities and concerns” (The College Board, 2010a, ¶ 1).

Cost of attendance – tuition and fees; “an allowance for books, supplies, transportation, dependent care, and miscellaneous expenses;” and living allowances (U.S. Department of Education, 2010, p. 4)

Delta Cost Project – “The mission of the Delta Project on Postsecondary Education Costs, Productivity, and Accountability is to help improve college affordability by controlling costs and improving productivity. The work is animated by the belief that college costs can be contained without sacrificing access or educational quality through better use of data to inform strategic decision making” (Delta Project, 2010, ¶ 10). “The Delta Project is an independent non-profit organization” (Delta Project, 2010, ¶ 11).

Financial aid – “Money provided to the student and the family to help them pay for the student's education or which is conditioned on the student's attendance at an educational institution. Major forms of financial aid include gift aid (grants and scholarships) and self-help aid (loans and work)” (FinAid, 2010a).

Geographic regions – four distinct regions, groupings of states, within the United States, as defined by the U.S. Census (U.S. Census Bureau, 2010)

Midwest: IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI

Northeast: CT, ME, MA, NH, NJ, NY, PA, RI, VT

South: AL, AR, DE, DC, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV

West: AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY

Hispanic – U.S. Census created “American” term/ classification for those from Spanish-speaking countries (Gamboa & Vasquez, 2006)

Integrated Postsecondary Education Data System [IPEDS] – “It is a system of interrelated surveys conducted annually by the U.S. Department’s National Center for Education Statistics (NCES). IPEDS gathers information from every college, university, and technical and vocational institution that participates in the federal student financial aid programs. The Higher Education Act of 1965, as amended, requires that institutions that participate in federal student aid programs report data on enrollments, program completions, graduation rates, faculty and staff, finances, institutional prices, and student financial aid” (National Center for Education Statistics, 2010a, ¶ 1).

Low-income – “the bottom quintile by family income, such as family incomes below about \$40,000, by Pell Grant eligibility, or families with incomes below 200% of the poverty line” (FinAid, 2010b, ¶ 2)

Master’s Colleges and Universities – “Generally includes institutions that award at least 50 master's degrees and fewer than 20 doctoral degrees per year” (The Carnegie Foundation for the Advancement of Teaching, 2010a, ¶ 16)

National Center for Education Statistics – “The primary federal entity for collecting and analyzing data related to education in the U.S. and other nations” (National Center for Education Statistics, 2010b, ¶ 2)

Need – “the difference between the price of attending a postsecondary institution and what the student is expected to pay” (Choy, 2000, p. 15)

Need-based – financial aid that is dependent upon financial circumstances, such as expected family contribution (FinAid, 2010a)

Non-need-based (merit-based) – Financial aid that is dependent upon academic, artistic, or athletic merit, or some other special talent, without regard to the existence of financial need (FinAid, 2010a)

Pell Grant – “The Federal Pell Grant program helps ensure access to postsecondary education for low- and middle-income undergraduate students by providing grants that, in combination with other sources of student aid, help meet postsecondary education costs” (U.S. Department of Education, 2010, p. 1).

Public institution – “A postsecondary educational institution whose programs and activities are operated by publicly elected or appointed school officials and which is supported primarily by public funds” (National Center for Education Statistics, 2010c, ¶ 11)

Socioeconomic status – A variable that consists of parental involvement, family income, and class status (Perna & Titus, 2004; St. John et al., 2005)

Appendix B
 Listing of Public Master's-Level Institutions by Geographic Region, Campus Setting, and
 Carnegie Basic Classification

| Institution Name | City | State | Region | Setting | Carnegie |
|------------------------------------------------------------|------------------|--------------|---------------|----------------|-----------------|
| Alabama A & M University | Normal | AL | South | Rural | Larger |
| Alabama State University | Montgomery | AL | South | Rural | Larger |
| Auburn University at Montgomery | Montgomery | AL | South | Rural | Larger |
| Jacksonville State University | Jacksonville | AL | South | Rural | Larger |
| University of Montevallo | Montevallo | AL | South | Suburban | Medium |
| University of North Alabama | Florence | AL | South | Rural | Larger |
| University of South Alabama | Mobile | AL | South | Urban | Larger |
| University of West Alabama | Livingston | AL | South | Rural | Medium |
| Arkansas State University- Main Campus | State University | AR | South | Rural | Larger |
| Arkansas Tech University | Russellville | AR | South | Rural | Medium |
| Henderson State University | Arkadelphia | AR | South | Rural | Medium |
| University of Arkansas at Monticello | Monticello | AR | South | Rural | Smaller |
| University of Central Arkansas | Conway | AR | South | Suburban | Larger |
| California Polytechnic State University-San Luis Obispo | San Luis Obispo | CA | West | Rural | Larger |
| California State Polytechnic University-Pomona | Pomona | CA | West | Suburban | Larger |
| California State University- Bakersfield | Bakersfield | CA | West | Urban | Larger |
| California State University- Chico | Chico | CA | West | Rural | Larger |
| California State University- Dominguez Hills | Carson | CA | West | Suburban | Larger |
| California State University- East Bay | Hayward | CA | West | Suburban | Larger |
| California State University- Fresno | Fresno | CA | West | Urban | Larger |
| California State University- Fullerton | Fullerton | CA | West | Suburban | Larger |

| | | | | | |
|--------------------------------------------|------------------|----|-----------|----------|---------|
| California State University-Long Beach | Long Beach | CA | West | Urban | Larger |
| California State University-Los Angeles | Los Angeles | CA | West | Urban | Larger |
| California State University-Northridge | Northridge | CA | West | Suburban | Larger |
| California State University-Sacramento | Sacramento | CA | West | Urban | Larger |
| California State University-San Bernardino | San Bernardino | CA | West | Urban | Larger |
| California State University-San Marcos | San Marcos | CA | West | Suburban | Medium |
| California State University-Stanislaus | Turlock | CA | West | Rural | Medium |
| Humboldt State University | Arcata | CA | West | Rural | Medium |
| San Francisco State University | San Francisco | CA | West | Urban | Larger |
| San Jose State University | San Jose | CA | West | Urban | Larger |
| Sonoma State University | Rohnert Park | CA | West | Rural | Larger |
| Adams State College | Alamosa | CO | West | Rural | Larger |
| University of Colorado at Colorado Springs | Colorado Springs | CO | West | Urban | Larger |
| Central Connecticut State University | New Britain | CT | Northeast | Suburban | Larger |
| Eastern Connecticut State University | Willimantic | CT | Northeast | Suburban | Medium |
| Southern Connecticut State University | New Haven | CT | Northeast | Urban | Larger |
| Western Connecticut State University | Danbury | CT | Northeast | Rural | Larger |
| Delaware State University | Dover | DE | South | Rural | Smaller |
| University of North Florida | Jacksonville | FL | South | Urban | Larger |
| Albany State University | Albany | GA | South | Rural | Medium |
| Armstrong Atlantic State University | Savannah | GA | South | Rural | Larger |
| Augusta State University | Augusta | GA | South | Rural | Medium |
| Columbus State University | Columbus | GA | South | Rural | Larger |
| Fort Valley State University | Fort Valley | GA | South | Rural | Smaller |
| Georgia College & State University | Milledgeville | GA | South | Rural | Larger |

| | | | | | |
|----------------------------------------------------|---------------------|----|---------|----------|---------|
| Georgia Southwestern State University | Americus | GA | South | Rural | Medium |
| Kennesaw State University | Kennesaw | GA | South | Suburban | Larger |
| North Georgia College & State University | Dahlonega | GA | South | Rural | Medium |
| Savannah State University | Savannah | GA | South | Rural | Smaller |
| Southern Polytechnic State University | Marietta | GA | South | Suburban | Medium |
| University of West Georgia | Carrollton | GA | South | Suburban | Larger |
| Valdosta State University | Valdosta | GA | South | Rural | Larger |
| University of Northern Iowa | Cedar Falls | IA | Midwest | Rural | Larger |
| Boise State University | Boise | ID | West | Rural | Larger |
| Chicago State University | Chicago | IL | Midwest | Urban | Larger |
| Eastern Illinois University | Charleston | IL | Midwest | Rural | Larger |
| Southern Illinois University Edwardsville | Edwardsville | IL | Midwest | Suburban | Larger |
| Western Illinois University | Macomb | IL | Midwest | Rural | Larger |
| Indiana University-Purdue University-Fort Wayne | Fort Wayne | IN | Midwest | Urban | Medium |
| Purdue University-Calumet Campus | Hammond | IN | Midwest | Suburban | Medium |
| University of Southern Indiana | Evansville | IN | Midwest | Rural | Medium |
| Emporia State University | Emporia | KS | Midwest | Rural | Larger |
| Fort Hays State University | Hays | KS | Midwest | Rural | Larger |
| Pittsburg State University | Pittsburg | KS | Midwest | Rural | Larger |
| Washburn University | Topeka | KS | Midwest | Rural | Medium |
| Eastern Kentucky University | Richmond | KY | South | Rural | Larger |
| Morehead State University | Morehead | KY | South | Rural | Larger |
| Murray State University | Murray | KY | South | Rural | Larger |
| Northern Kentucky University | Highland Heights | KY | South | Suburban | Larger |
| Western Kentucky University | Bowling Green | KY | South | Rural | Larger |
| Grambling State University | Grambling | LA | South | Rural | Medium |
| McNeese State University | Lake Charles | LA | South | Rural | Larger |
| Nicholls State University | Thibodaux | LA | South | Rural | Medium |
| Northwestern State University of Louisiana | Natchitoches | LA | South | Rural | Larger |
| Southeastern Louisiana University | Hammond | LA | South | Rural | Larger |

| | | | | | |
|---------------------------------------|-------------------|----|-----------|----------|---------|
| Southern University and A & M College | Baton Rouge | LA | South | Urban | Larger |
| University of Louisiana Monroe | Monroe | LA | South | Rural | Larger |
| Bridgewater State College | Bridgewater | MA | Northeast | Rural | Larger |
| Fitchburg State College | Fitchburg | MA | Northeast | Rural | Larger |
| Framingham State College | Framingham | MA | Northeast | Suburban | Larger |
| Salem State College | Salem | MA | Northeast | Suburban | Larger |
| Westfield State College | Westfield | MA | Northeast | Suburban | Medium |
| Worcester State College | Worcester | MA | Northeast | Urban | Medium |
| Bowie State University | Bowie | MD | South | Suburban | Larger |
| Coppin State University | Baltimore | MD | South | Urban | Medium |
| Frostburg State University | Frostburg | MD | South | Rural | Larger |
| Salisbury University | Salisbury | MD | South | Rural | Larger |
| Towson University | Towson | MD | South | Suburban | Larger |
| University of Maryland Eastern Shore | Princess Anne | MD | South | Rural | Smaller |
| Eastern Michigan University | Ypsilanti | MI | Midwest | Suburban | Larger |
| Ferris State University | Big Rapids | MI | Midwest | Rural | Medium |
| Grand Valley State University | Allendale | MI | Midwest | Suburban | Larger |
| Northern Michigan University | Marquette | MI | Midwest | Rural | Larger |
| Saginaw Valley State University | University Center | MI | Midwest | Rural | Larger |
| Bemidji State University | Bemidji | MN | Midwest | Rural | Smaller |
| Minnesota State University-Mankato | Mankato | MN | Midwest | Rural | Larger |
| Minnesota State University-Moorhead | Moorhead | MN | Midwest | Rural | Smaller |
| Saint Cloud State University | Saint Cloud | MN | Midwest | Rural | Larger |
| University of Minnesota-Duluth | Duluth | MN | Midwest | Rural | Medium |
| Winona State University | Winona | MN | Midwest | Rural | Medium |
| Lincoln University | Jefferson City | MO | Midwest | Rural | Smaller |
| Missouri State University | Springfield | MO | Midwest | Rural | Larger |
| Northwest Missouri State University | Maryville | MO | Midwest | Rural | Medium |
| Southeast Missouri State University | Cape Girardeau | MO | Midwest | Rural | Larger |
| Truman State University | Kirksville | MO | Midwest | Rural | Medium |

| | | | | | |
|-----------------------------------------------|--------------|----|-----------|----------|---------|
| University of Central Missouri | Warrensburg | MO | Midwest | Rural | Larger |
| Alcorn State University | Alcorn State | MS | South | Rural | Medium |
| Delta State University | Cleveland | MS | South | Rural | Medium |
| Mississippi University for Women | Columbus | MS | South | Rural | Smaller |
| Mississippi Valley State University | Itta Bena | MS | South | Rural | Smaller |
| Montana State University-Billings | Billings | MT | West | Rural | Medium |
| Appalachian State University | Boone | NC | South | Rural | Larger |
| Fayetteville State University | Fayetteville | NC | South | Rural | Smaller |
| North Carolina Central University | Durham | NC | South | Urban | Larger |
| University of North Carolina at Pembroke | Pembroke | NC | South | Rural | Medium |
| University of North Carolina-Wilmington | Wilmington | NC | South | Rural | Larger |
| Western Carolina University | Cullowhee | NC | South | Rural | Larger |
| University of Nebraska at Kearney | Kearney | NE | Midwest | Rural | Medium |
| Wayne State College | Wayne | NE | Midwest | Rural | Medium |
| Kean University | Union | NJ | Northeast | Suburban | Larger |
| Montclair State University | Montclair | NJ | Northeast | Suburban | Larger |
| New Jersey City University | Jersey City | NJ | Northeast | Urban | Larger |
| Ramapo College of New Jersey | Mahwah | NJ | Northeast | Suburban | Smaller |
| Rowan University | Glassboro | NJ | Northeast | Suburban | Larger |
| The College of New Jersey | Ewing | NJ | Northeast | Rural | Larger |
| The Richard Stockton College of New Jersey | Pomona | NJ | Northeast | Rural | Smaller |
| William Paterson University of New Jersey | Wayne | NJ | Northeast | Suburban | Larger |
| Eastern New Mexico University-Main Campus | Portales | NM | West | Rural | Smaller |
| New Mexico Highlands University | Las Vegas | NM | West | Rural | Larger |
| New Mexico Institute of Mining and Technology | Socorro | NM | West | Rural | Medium |
| Western New Mexico University | Silver City | NM | West | Rural | Medium |
| SUNY at Fredonia | Fredonia | NY | Northeast | Rural | Larger |

| | | | | | |
|------------------------------------------------|---------------------|----|-----------|----------|---------|
| SUNY at Geneseo | Geneseo | NY | Northeast | Suburban | Medium |
| SUNY College at Brockport | Brockport | NY | Northeast | Suburban | Larger |
| SUNY College at Buffalo | Buffalo | NY | Northeast | Urban | Larger |
| SUNY College at Cortland | Cortland | NY | Northeast | Rural | Larger |
| SUNY College at New Paltz | New Paltz | NY | Northeast | Rural | Larger |
| SUNY College at Oneonta | Oneonta | NY | Northeast | Rural | Smaller |
| SUNY College at Oswego | Oswego | NY | Northeast | Suburban | Larger |
| SUNY College at Plattsburgh | Plattsburgh | NY | Northeast | Rural | Larger |
| SUNY College at Potsdam | Potsdam | NY | Northeast | Rural | Larger |
| SUNY Institute of Technology at Utica-Rome | Utica | NY | Northeast | Rural | Medium |
| Youngstown State University | Youngstown | OH | Midwest | Urban | Larger |
| Cameron University | Lawton | OK | South | Rural | Medium |
| East Central University | Ada | OK | South | Rural | Larger |
| Northeastern State University | Tahlequah | OK | South | Rural | Larger |
| Southeastern Oklahoma State University | Durant | OK | South | Rural | Medium |
| Southwestern Oklahoma State University | Weatherford | OK | South | Rural | Smaller |
| University of Central Oklahoma | Edmond | OK | South | Suburban | Larger |
| Eastern Oregon University | La Grande | OR | West | Rural | Medium |
| Southern Oregon University | Ashland | OR | West | Rural | Larger |
| Western Oregon University | Monmouth | OR | West | Rural | Larger |
| Bloomsburg University of Pennsylvania | Bloomsburg | PA | Northeast | Suburban | Larger |
| California University of Pennsylvania | California | PA | Northeast | Suburban | Larger |
| Cheyney University of Pennsylvania | Cheyney | PA | Northeast | Suburban | Medium |
| Clarion University of Pennsylvania | Clarion | PA | Northeast | Rural | Larger |
| East Stroudsburg University of Pennsylvania | East Stroudsburg | PA | Northeast | Rural | Larger |
| Edinboro University of Pennsylvania | Edinboro | PA | Northeast | Rural | Larger |
| Kutztown University of Pennsylvania | Kutztown | PA | Northeast | Rural | Larger |
| Lock Haven University | Lock Haven | PA | Northeast | Rural | Smaller |

| | | | | | |
|--------------------------------------------|----------------|----|-----------|----------|---------|
| Mansfield University of Pennsylvania | Mansfield | PA | Northeast | Rural | Smaller |
| Millersville University of Pennsylvania | Millersville | PA | Northeast | Rural | Larger |
| Shippensburg University of Pennsylvania | Shippensburg | PA | Northeast | Suburban | Larger |
| Slippery Rock University of Pennsylvania | Slippery Rock | PA | Northeast | Suburban | Larger |
| West Chester University of Pennsylvania | West Chester | PA | Northeast | Suburban | Larger |
| Rhode Island College | Providence | RI | Northeast | Urban | Larger |
| Citadel Military College of South Carolina | Charleston | SC | South | Urban | Larger |
| College of Charleston | Charleston | SC | South | Urban | Medium |
| Francis Marion University | Florence | SC | South | Rural | Smaller |
| Winthrop University | Rock Hill | SC | South | Urban | Larger |
| Austin Peay State University | Clarksville | TN | South | Rural | Medium |
| Middle Tennessee State University | Murfreesboro | TN | South | Suburban | Larger |
| Tennessee Technological University | Cookeville | TN | South | Rural | Larger |
| Angelo State University | San Angelo | TX | South | Rural | Medium |
| Lamar University | Beaumont | TX | South | Rural | Larger |
| Midwestern State University | Wichita Falls | TX | South | Rural | Medium |
| Prairie View A & M University | Prairie View | TX | South | Rural | Larger |
| Stephen F Austin State University | Nacogdoches | TX | South | Rural | Larger |
| Sul Ross State University | Alpine | TX | South | Rural | Larger |
| Tarleton State University | Stephenville | TX | South | Rural | Larger |
| Texas A & M International University | Laredo | TX | South | Rural | Medium |
| Texas A & M University-Corpus Christi | Corpus Christi | TX | South | Rural | Larger |
| Texas Southern University | Houston | TX | South | Urban | Medium |
| Texas State University-San Marcos | San Marcos | TX | South | Urban | Larger |
| West Texas A & M University | Canyon | TX | South | Rural | Larger |
| Southern Utah University | Cedar City | UT | West | Rural | Smaller |
| Weber State University | Ogden | UT | West | Urban | Medium |

| | | | | | |
|---------------------------------------------------------------|----------------|----|---------|----------|---------|
| James Madison University | Harrisonburg | VA | South | Rural | Larger |
| Longwood University | Farmville | VA | South | Rural | Medium |
| Norfolk State University | Norfolk | VA | South | Urban | Larger |
| Radford University | Radford | VA | South | Rural | Larger |
| University of Mary Washington | Fredericksburg | VA | South | Suburban | Medium |
| Virginia State University Central Washington University | Petersburg | VA | South | Urban | Medium |
| Eastern Washington University | Ellensburg | WA | West | Rural | Larger |
| The Evergreen State College | Cheney | WA | West | Rural | Larger |
| Western Washington University | Olympia | WA | West | Rural | Smaller |
| University of Wisconsin- Eau Claire | Bellingham | WA | West | Rural | Larger |
| University of Wisconsin-La Crosse | Eau Claire | WI | Midwest | Rural | Medium |
| University of Wisconsin- Oshkosh | La Crosse | WI | Midwest | Rural | Larger |
| University of Wisconsin- Platteville | Oshkosh | WI | Midwest | Rural | Larger |
| University of Wisconsin- River Falls | Platteville | WI | Midwest | Rural | Medium |
| University of Wisconsin- Stevens Point | River Falls | WI | Midwest | Suburban | Medium |
| University of Wisconsin- Stout | Stevens Point | WI | Midwest | Rural | Medium |
| University of Wisconsin- Superior | Menomonie | WI | Midwest | Rural | Larger |
| University of Wisconsin- Whitewater | Superior | WI | Midwest | Rural | Medium |
| Marshall University | Whitewater | WI | Midwest | Rural | Larger |
| | Huntington | WV | South | Rural | Larger |

Appendix C
Glossary for IPEDS, DCP, ASC, and Kinkead Data Points

IPEDS Data Points

Total Cost of Attendance (in-state): cost of attendance for full-time, first-time degree-seeking in-state undergraduate students living on campus for the academic year 2007-2008; COA includes in-state tuition and fees, books, supplies, on-campus room and board, plus other on campus expenses (NCES, 2010a).

Total Cost of Attendance (out-of-state): cost of attendance for full-time, first-time degree-seeking out-of-state undergraduate students living on campus for the academic year 2007-2008; COA includes out-of-state tuition and fees, books, supplies, on-campus room and board, plus other on campus expenses (NCES, 2010a).

Other Federal Grant Aid: Federal dollars awarded to institutions under Federal government student aid programs, including the Supplemental Educational Opportunity Grants (SEOG), DHHS training grants (aid portion), State Student Incentive Grants (SSIG), and other Federal student aid programs. Pell Grants are not included in this categorization (NCES, 2010a).

DCP Data Points

Low-income Dependent Undergraduate: dependent undergraduate student who applied for financial aid and whose FTI (FISAP Total Income) was under \$30,000 (Delta Project, 2010; U.S. Department of Education, 2010)

Low-income Independent Undergraduate: independent undergraduate financial aid applicants whose FTI (FISAP Total Income) was under \$20,000 (Delta Project, 2010; U.S. Department of Education, 2010)

ASC Data Points

Institutional Scholarships/ Grants: Endowed scholarships, annual gifts, and tuition funded grants awarded by the college, excluding athletic grants and tuition waivers (The College Board, 2010b)

Need-based Aid: includes non-need-based aid used to meet need (The College Board, 2010b)

Non-need-based Aid: excludes non-need-based aid used to meet need (The College Board, 2010b)

Number of Enrolled Students Awarded Aid: the number of degree-seeking full-time undergraduates who applied for and were awarded financial aid from any source (The College Board, 2010b)

Kinkead Data Points

Rural: An institution located in a city where the population is less than 500,000

Suburban: An institution located outside the confines of a Primary Metropolitan Statistical Area (PMSA) or Metropolitan Statistical Area (MSA) with a population of at least 500,000

Urban: An institution located within the confines of a Primary Metropolitan Statistical Area (PMSA) or Metropolitan Statistical Area (MSA) with a population of at least 500,000

Appendix D
Data Dictionary (Variables of Interest)

| SPSS Code | Variable – Long Name | Variable Type | Data Source | Description |
|------------------|----------------------------------------------------|----------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LIUGENT | Low-income undergraduate enrollment – total number | Continuous | DCP 1987-2008 data file | Total number of low-income undergraduate students enrolled at public Master's Colleges and Universities (low-income defined as family income less than \$30,000 for dependent students or total income less than \$20,000 for independent students) |
| LIUGENP | Low-income undergraduate enrollment – percentage | Continuous | DCP 1987-2008 data file | Calculated percentage of low-income undergraduate enrollment at public Master's Colleges and Universities |
| TCOAIS | Total cost of undergraduate attendance (in-state) | Continuous | IPEDS IC 2007-2008 | Total U.S. Dollar amount of cost for in-state residents to attend the institution and reside on-campus, to include tuition, fees, room, board, transportation, books, and miscellaneous expenses |

| SPSS Code | Variable – Long Name | Variable Type | Data Source | Description |
|------------------|-------------------------------------------------------|----------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TCOAOOS | Total cost of undergraduate attendance (out-of-state) | Continuous | IPEDS IC 2007-2008 | Total U.S. Dollar amount of cost for out-of-state residents to attend the institution and reside on-campus, to include tuition, fees, room, board, transportation, books, and miscellaneous expenses |
| NUMPELL | Number of Pell Grant recipients | Continuous | IPEDS SFA 2007-2008 | Total number of first-time, full-time, degree-seeking undergraduate students receiving the Pell Grant |
| PCTPELL | Percentage of Pell Grant recipients | Continuous | IPEDS SFA 2007-2008 | Percentage of first-time, full-time, degree-seeking undergraduate students receiving the Pell Grant |
| AVGPELL | Average Pell Grant award | Continuous | IPEDS SFA 2007-2008 | Mean amount of Pell Grant awarded to first-time, full-time, degree-seeking undergraduates, in U.S. Dollars |
| TOTPELL | Total Pell Grant dollars awarded | Continuous | IPEDS Finance Survey 2007-2008 | Total amount (in U.S. Dollars) of Pell Grant aid awarded to degree-seeking undergraduates at the institution |

| SPSS Code | Variable – Long Name | Variable Type | Data Source | Description |
|------------------|-----------------------------------------------------|----------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| NUMFEDGA | Number of recipients of other Federal grant aid | Continuous | IPEDS SFA 2007-2008 | Total number of first-time, full-time, degree-seeking undergraduates receiving some form of Federal grant aid other than Pell Grant |
| PCTFEDGA | Percentage of recipients of other Federal grant aid | Continuous | IPEDS SFA 2007-2008 | Percentage of first-time, full-time, degree-seeking undergraduates receiving some form of Federal grant aid other than Pell Grant |
| AVGFEDGA | Average amount of other Federal grant aid award | Continuous | IPEDS SFA 2007-2008 | Mean U.S. Dollar amount of other Federal grant aid awarded to first-time, full-time, degree-seeking undergraduates |
| TOTFEDGA | Total other Federal grant aid dollars awarded | Continuous | IPEDS Finance Survey 2007-2008 | Total amount (in U.S. Dollars) of other Federal grant aid awarded to degree-seeking undergraduates at the institution |
| NUMSTAID | Number of recipients of state aid | Continuous | IPEDS SFA 2007-2008 | Total number of first-time, full-time, degree-seeking undergraduates receiving some form of state and/or local aid |

| SPSS Code | Variable – Long Name | Variable Type | Data Source | Description |
|------------------|-----------------------------------------------|----------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------|
| PCTSTAID | Percentage of recipients of state aid | Continuous | IPEDS SFA 2007-2008 | Percentage of first-time, full-time, degree-seeking undergraduates receiving some form of state and/or local aid |
| AVGSTAID | Average amount of state aid award | Continuous | IPEDS SFA 2007-2008 | Mean amount (in U.S. Dollars) of state or local aid awarded to first-time, full-time, degree-seeking undergraduates |
| TOTSTAID | Total state aid dollars awarded | Continuous | IPEDS Finance Survey 2007-2008 | Total amount (in U.S. Dollars) of state or local aid awarded to degree-seeking undergraduates at the institution |
| NUMINSTA | Number of recipients of institutional aid | Continuous | IPEDS SFA 2007-2008 | Total number of first-time, full-time, degree-seeking undergraduates receiving institutional aid |
| PCTINSTA | Percentage of recipients of institutional aid | Continuous | IPEDS SFA 2007-2008 | Percentage of first-time, full-time, degree-seeking undergraduates receiving institutional aid |
| AVGINSTA | Average amount of institutional aid award | Continuous | IPEDS SFA 2007-2008 | Mean amount (in U.S. Dollars) of institutional aid awarded to first-time, full-time, degree-seeking undergraduates |

| SPSS Code | Variable – Long Name | Variable Type | Data Source | Description |
|------------------|----------------------------------------------------------|----------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| TOTINSTA | Total dollars awarded as institutional aid | Continuous | IPEDS Finance Survey 2007-2008 | Total amount (in U.S. Dollars) of institutional aid awarded to degree-seeking undergraduates at the institution |
| NUMNBIA | Number recipients of need-based institutional aid | Continuous | College Board, ASC 2009 data file | Total number of full-time, degree-seeking undergraduates who applied for and received need-based institutional aid, 106 institutions reporting |
| PCTNBIA | Percentage of recipients of need-based institutional aid | Continuous | College Board, ASC 2009 data file | Calculated percentage of full-time, degree-seeking undergraduates who applied for and received need-based institutional aid, 106 institutions reporting |
| AVGNBIA | Average amount of need-based institutional aid award | Continuous | College Board, ASC 2009 data file | Mean amount (in U.S. Dollars) of need-based institutional aid awarded to full-time, degree-seeking undergraduates, 106 institutions reporting |

| SPSS Code | Variable – Long Name | Variable Type | Data Source | Description |
|------------------|--------------------------------------------------------------|----------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TOTNBIA | Total dollars awarded as need-based institutional aid | Continuous | College Board, ASC 2009 data file | Total amount (in U.S. Dollars) of need-based institutional aid awarded to degree-seeking undergraduates, including non-need-based aid used to meet need, 106 institutions reporting |
| NUMNNBIA | Number recipients of non-need-based institutional aid | Continuous | College Board, ASC 2009 data file | Total number of full-time, degree-seeking undergraduates who received a non-need-based institutional aid award (not athletic) and did not have financial need, 114 institutions reporting |
| PCTNNBIA | Percentage of recipients of non-need-based institutional aid | Continuous | College Board, ASC 2009 data file | Calculated percentage of full-time, degree-seeking undergraduates who received a non-need-based institutional aid award (not athletic) and did not have financial need, 114 institutions reporting |

| SPSS Code | Variable – Long Name | Variable Type | Data Source | Description |
|------------------|-------------------------------------------------------------|----------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AVGNNBIA | Average amount of non-need-based institutional aid award | Continuous | College Board, ASC 2009 data file | Mean amount (in U.S. Dollars) of non-need-based institutional aid (not athletic) awarded to full-time, degree-seeking undergraduates, 114 institutions reporting |
| TOTNNBIA | Total dollars awarded as non-need-based institutional aid | Continuous | College Board, ASC 2009 data file | Total amount (in U.S. Dollars) of non-need-based institutional aid (not athletic) awarded to degree-seeking undergraduates, excluding non-need-based aid used to meet need, 114 institutions reporting |
| NUMUGENR | Total fall undergraduate enrollment | Continuous | IPEDS EF 2007-2008 | Total number of undergraduate students enrolled at residential, public Master's Colleges and Universities in Fall 2007 |
| FTUGENRP | Percentage fall undergraduate enrollment that was full-time | Continuous | IPEDS EF 2007-2008 | Full-time undergraduate enrollment divided by total undergraduate enrollment at public Master's Colleges and Universities |

| SPSS Code | Variable – Long Name | Variable Type | Data Source | Description |
|------------------|-----------------------------------------------------------------|----------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MINUGENP | Percentage racial/ethnic minority fall undergraduate enrollment | Continuous | IPEDS EF 2007-2008 | Racial/ethnic minority undergraduate enrollment divided by total undergraduate enrollment at public master's-level institutions |
| FEMUGENP | Percentage female fall undergraduate enrollment | Continuous | IPEDS EF 2007-2008 | Female undergraduate enrollment divided by total undergraduate enrollment at public master's-level institutions |
| CARNEGIE | Master's Colleges and Universities-program size | Categorical | 2005 Carnegie Basic Classification | Smaller, Medium, or Larger (based on the volume of master's degree production) |
| GEOGREG | Geographic region | Categorical | 2010 U.S. Census | Institutions located in the following States: <i>Midwest</i> (IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI), <i>Northeast</i> (CT, ME, MA, NH, NJ, NY, PA, RI, VT), <i>South</i> (AL, AR, DE, DC, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV), or <i>West</i> (AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY) |

| SPSS Code | Variable – Long Name | Variable Type | Data Source | Description |
|-----------|----------------------|---------------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SETTING | Campus setting | Categorical | 2009 Kinkead typology | <p>Rural (An institution located in a city where the population is less than 500,000)</p> <p>Suburban (An institution located outside the confines of a Primary Metropolitan Statistical Area (PMSA) or Metropolitan Statistical Area (MSA) with a population of at least 500,000)</p> <p>Urban (An institution located within the confines of a Primary Metropolitan Statistical Area (PMSA) or Metropolitan Statistical Area (MSA) with a population of at least 500,000)</p> |

Appendix E
Data Analysis Table

| Research Question | Variable Codes | Dependent Variable(s) | Independent Variable(s) | Data Sources | Statistical Method |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| 2. To what degree does the selected combination of financial factors and institutional characteristics explain the number of low-income undergraduate students enrolled at public Master's Colleges and Universities in the U.S.? | LIUGENT TCOAIS TCOAOOS AVGPELL NUMFEDGA AVGFEDGA NUMSTAID AVGSTAID NUMINSTA AVGINSTA NUMUGENR FTUGENRP MINUGENP FEMUGENP CARNEGIE GEOGREG SETTING | Low-income undergraduate enrollment, total number | Mean total COA, in-state Mean total COA, out-of-state Pell Grant (mean award, number of recipients) Other Federal grant aid (mean award, number of recipients) State aid (mean award, number of recipients) Institutional aid (mean award, number of recipients) Total number undergraduate enrollment Percentage full-time undergraduate enrollment Percentage racial/ethnic minority undergraduate enrollment | DCP database 1987-2008, IPEDS SFA 2007-08, IPEDS IC 2007-08, IPEDS EF 2007-08, IPEDS F 2007-08, ASC 2008-09, 2005 Carnegie Basic Classification, 2010 U.S. Census, 2009 Kinkead typology | Significance testing of results from multiple linear regression |

| | | | | | |
|--|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| | | | <p>Percentage female undergraduate enrollment</p> <p>Master's Colleges and Universities-program size</p> <p>Geographic region</p> <p>Campus setting</p> <p><i>Secondary Regression:</i> Need-based institutional aid (mean award, number of recipients)</p> <p>Non-need-based institutional aid (mean award, number of recipients)</p> | | |
|--|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|

| Research Question | Variable Codes | Dependent Variable(s) | Independent Variable(s) | Data Sources | Statistical Method |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| 3. To what degree does the selected combination of financial factors and institutional characteristics explain the percentage of low-income undergraduate students enrolled at public Master's Colleges and Universities in the U.S.? | LIUGENP TCOAIS TCOAOOS AVGPELL PCTFEDGA AVGFEDGA PCTSTAID AVGSTAID PCTINSTA AVGINSTA NUMUGENR FTUGENRP MINUGENP FEMUGENP CARNEGIE GEOGREG SETTING | Low-income undergraduate enrollment, percentage | Mean total COA, in-state Mean total COA, out-of-state Pell Grant (mean award, percentage of recipients) Other Federal grant aid (mean award, percentage of recipients) State aid (mean award, percentage of recipients) Institutional aid (mean award, percentage of recipients) Total undergraduate enrollment Percentage full-time undergraduate enrollment Percentage racial/ethnic minority undergraduate enrollment | DCP database 1987-2008, IPEDS SFA 2007-08, IPEDS IC 2007-08, IPEDS EF 2007-08, IPEDS F 2007-08, ASC 2008-09, 2005 Carnegie Basic Classification, 2010 U.S. Census, 2009 Kinkead typology | Significance testing of results from multiple linear regression |

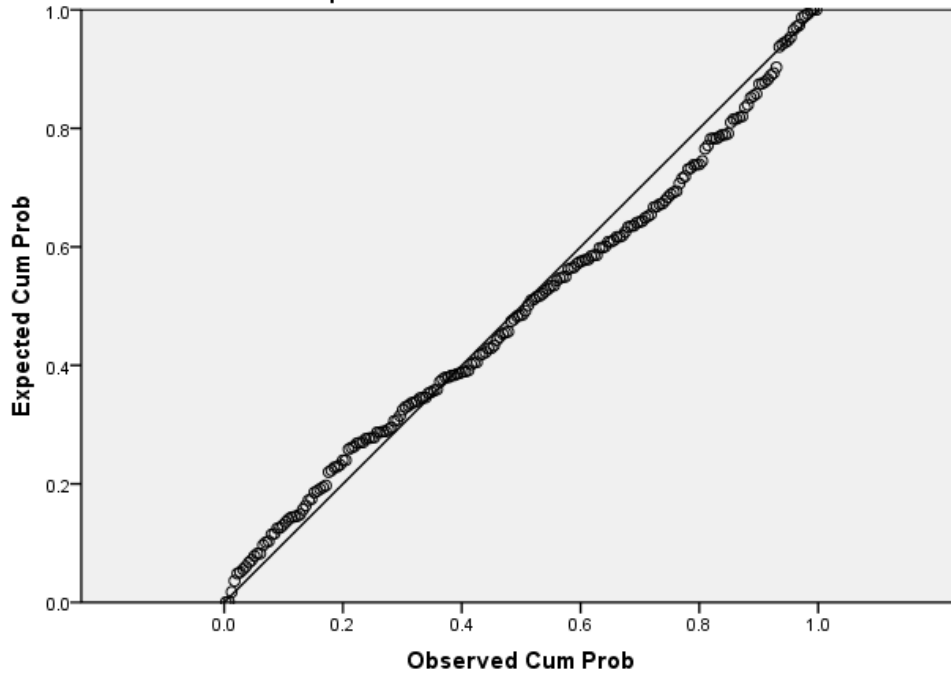
| | | | | | |
|--|--|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| | | | <p>Percentage female undergraduate enrollment</p> <p>Master's Colleges and Universities-program size</p> <p>Geographic region</p> <p>Campus setting</p> <p><i>Secondary Regression:</i> Need-based institutional aid (mean award, percentage of recipients)</p> <p>Non-need-based institutional aid (mean award, percentage of recipients)</p> | | |
|--|--|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|

Appendix F

Normal Probability Plots and Partial Subplots Related to Multiple Linear Regression Analyses

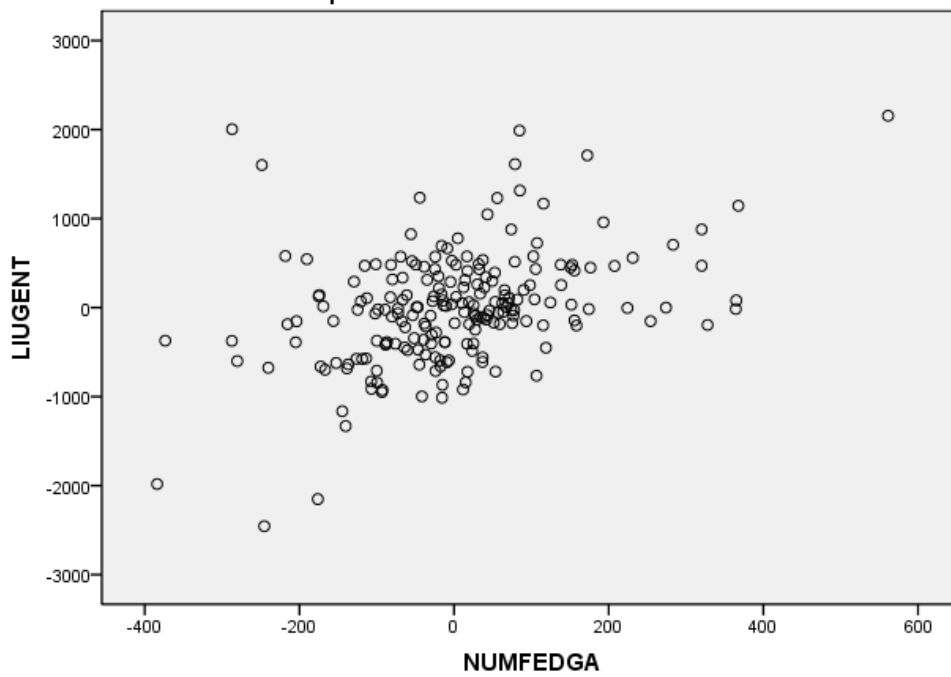
Normal P-P Plot of Regression Standardized Residual

Dependent Variable: LIUGENT

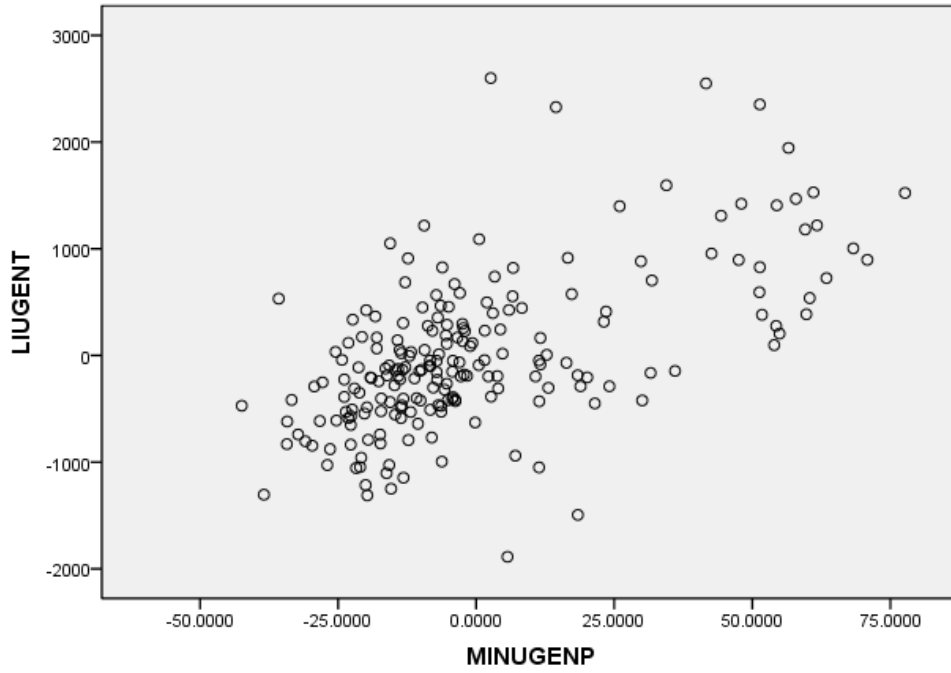


Partial Regression Plot

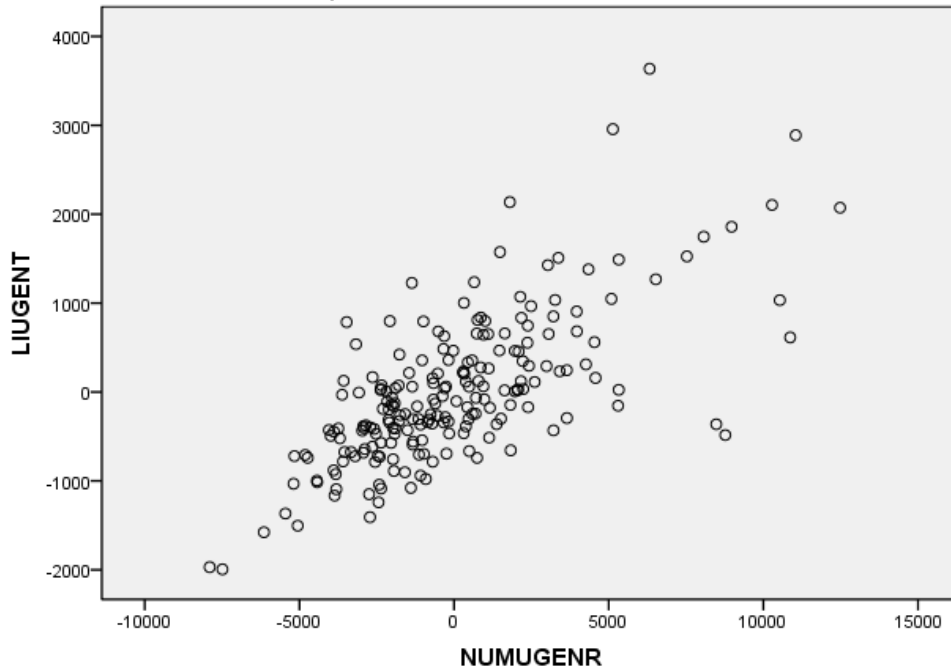
Dependent Variable: LIUGENT



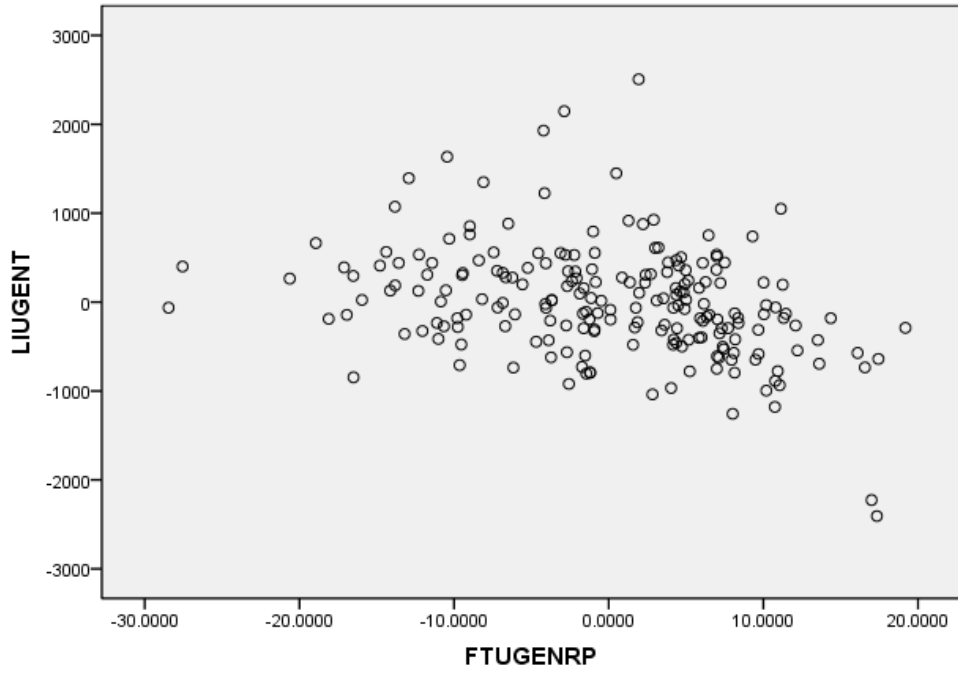
Partial Regression Plot
Dependent Variable: LIUGENT



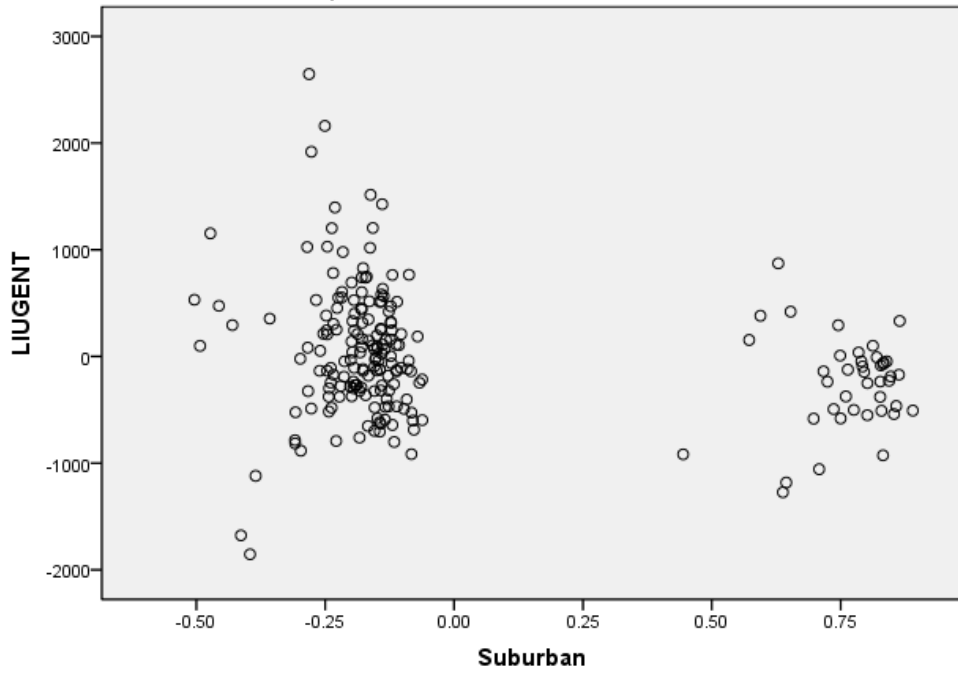
Partial Regression Plot
Dependent Variable: LIUGENT



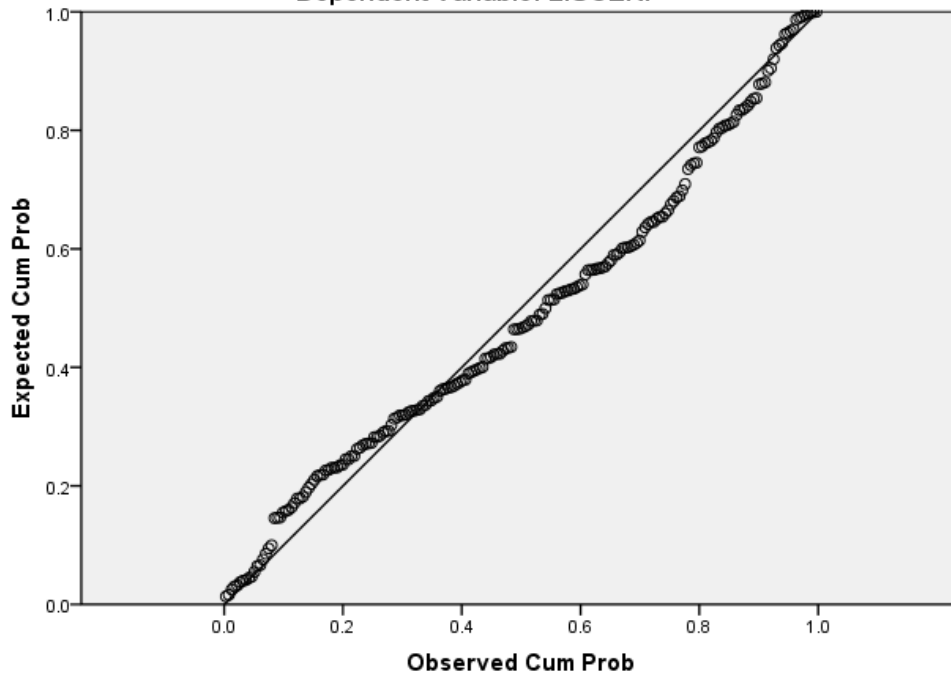
Partial Regression Plot
Dependent Variable: LIUGENT



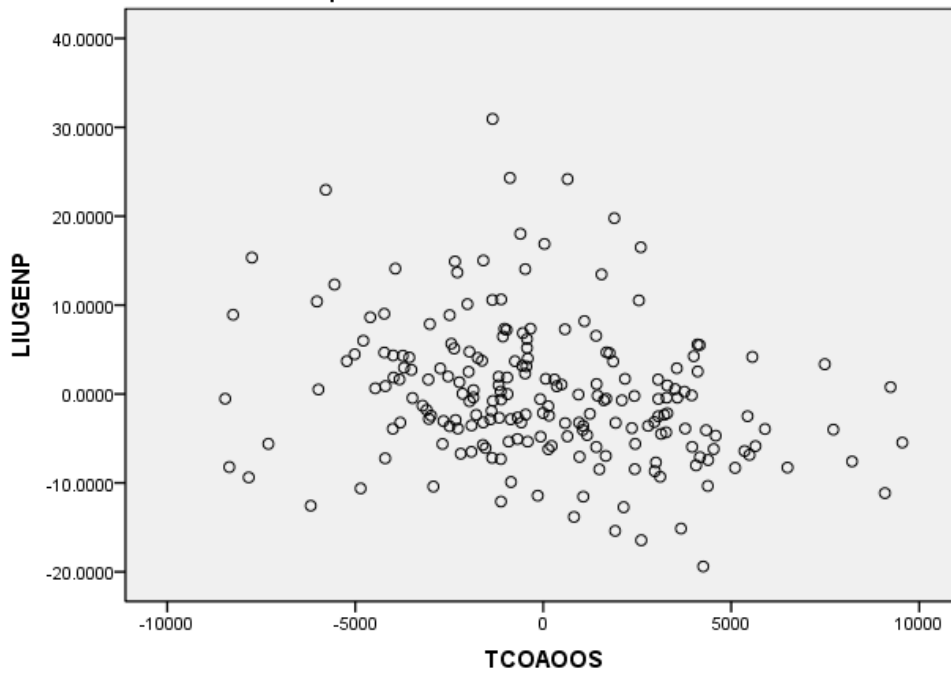
Partial Regression Plot
Dependent Variable: LIUGENT



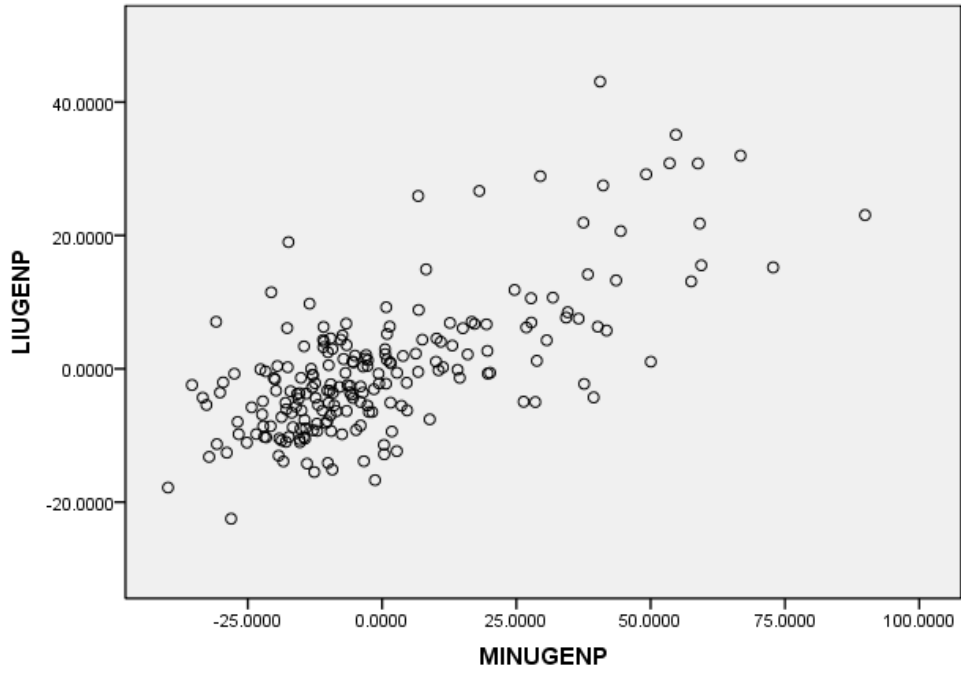
Normal P-P Plot of Regression Standardized Residual
Dependent Variable: LIUGENP



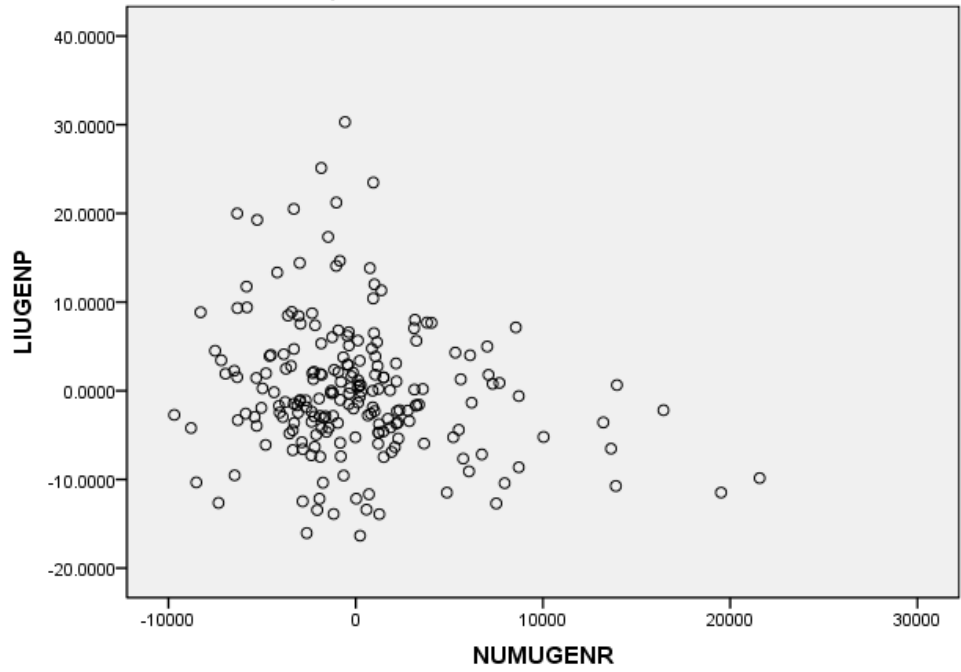
Partial Regression Plot
Dependent Variable: LIUGENP



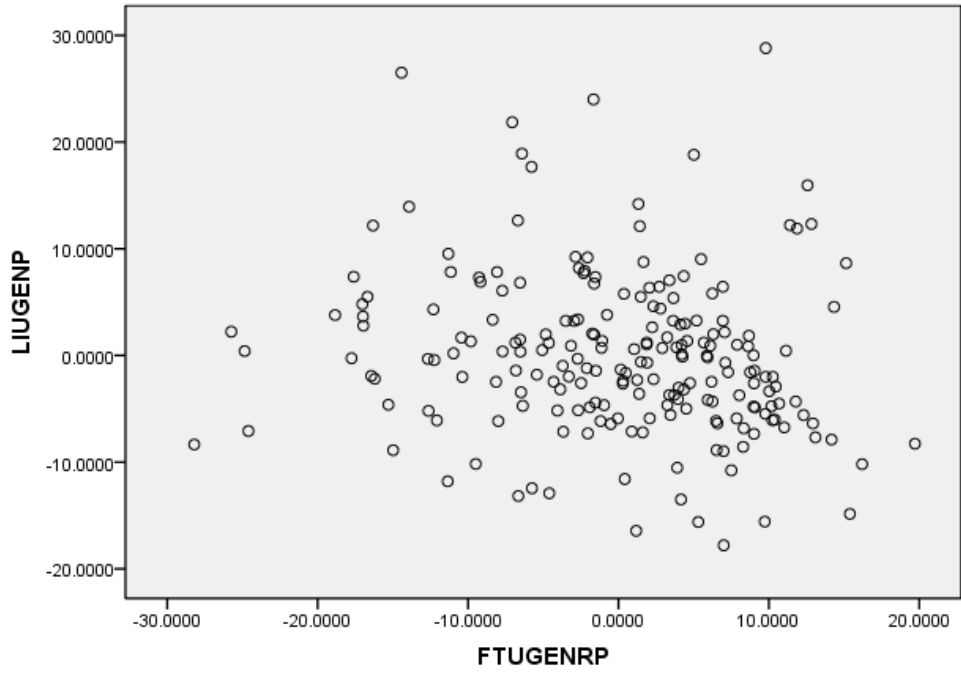
Partial Regression Plot
Dependent Variable: LIUGENP



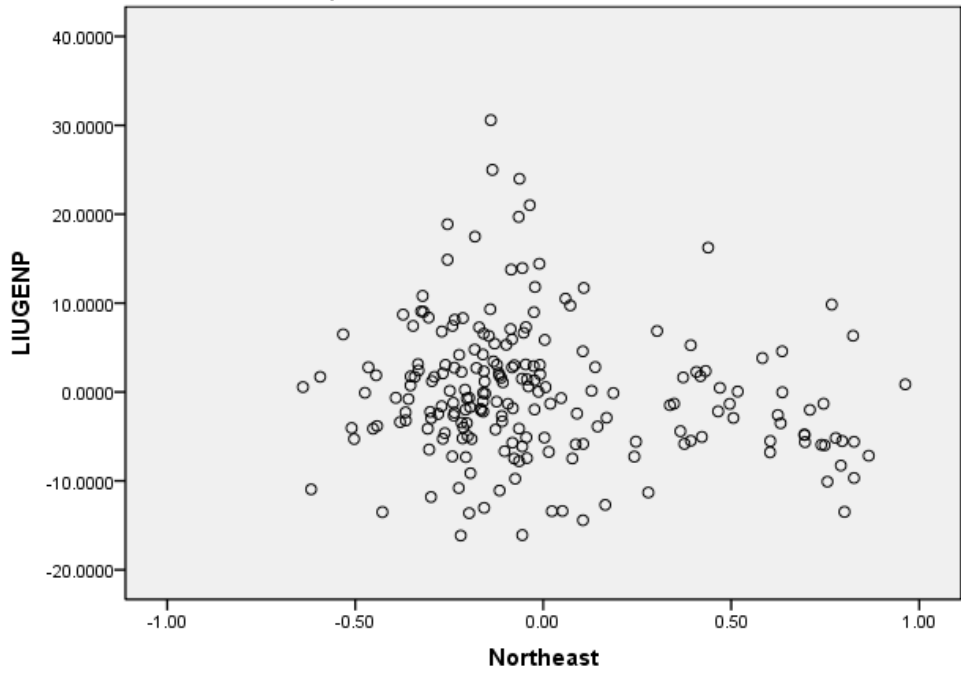
Partial Regression Plot
Dependent Variable: LIUGENP

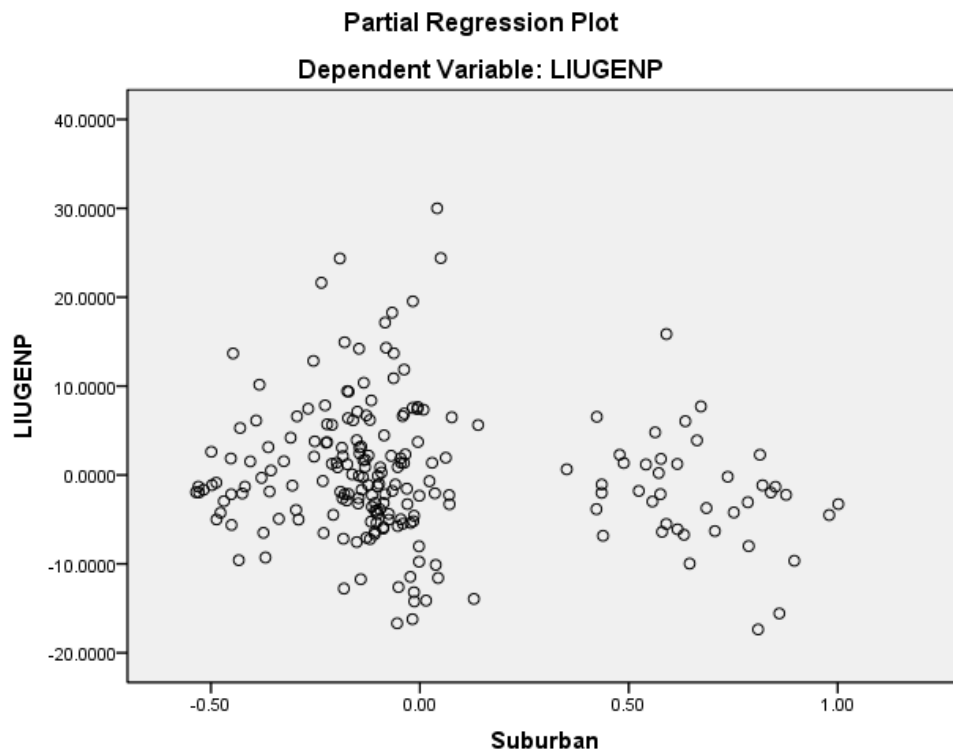
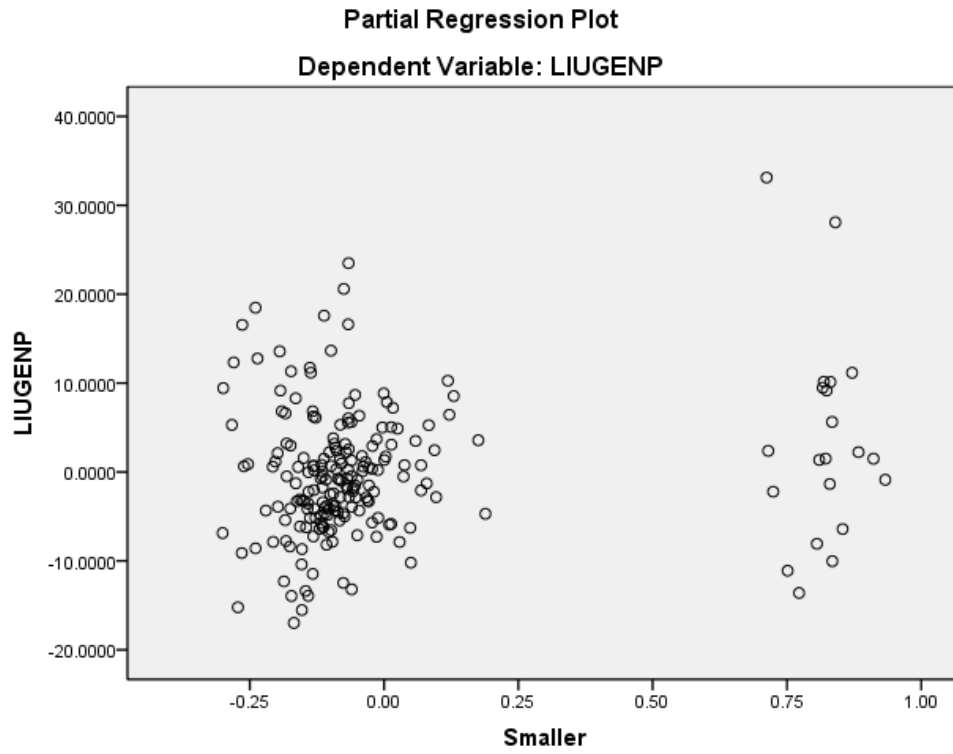


Partial Regression Plot
Dependent Variable: LIUGENP

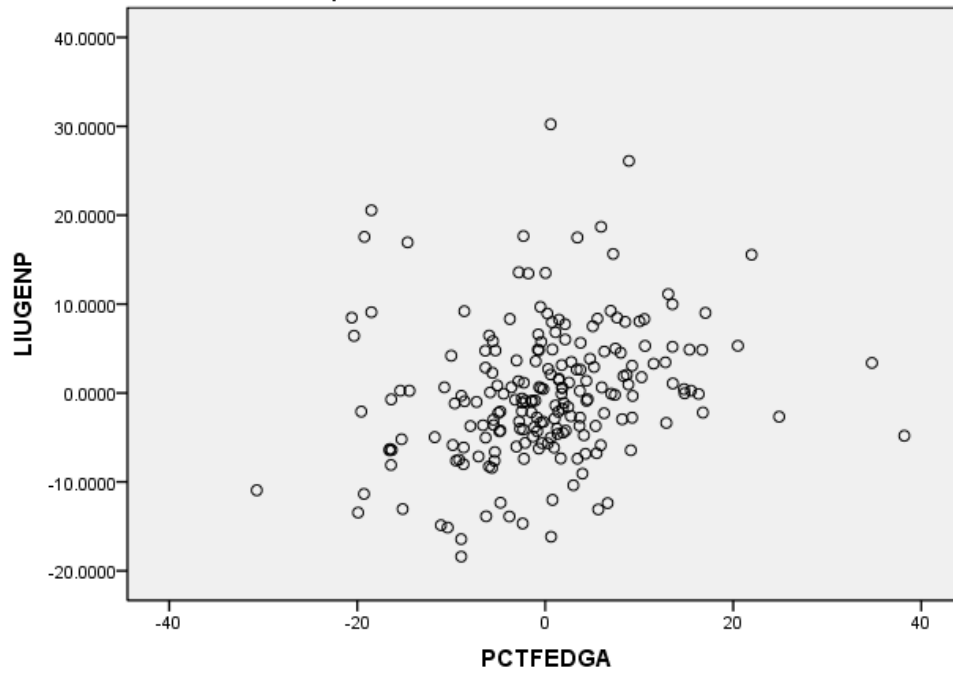


Partial Regression Plot
Dependent Variable: LIUGENP





Partial Regression Plot
Dependent Variable: LIUGENP



Appendix G IRB Approval Letter

Office of Research
Institutional Review Board for the
Protection of Human Subjects

THE UNIVERSITY OF
ALABAMA
RESEARCH

April 19, 2011

Lindsay Seaborn
ELPTS
College of Education
Box 870231

Re: IRB : EX-11-CM-035, Financial Factors and Institutional
Characteristics that Explain Undergraduate Enrollment by Low-Income Students
at Public Masters-Level Institutions

Dear Ms. Seaborn:

The University of Alabama Institutional Review Board has granted approval for
your proposed research.

Your application has been given exempt approval according to 45 CFR part
46.101(b)(4) as outlined below:

(4) Research involving the collection or study of existing data, documents,
records, pathological specimens, or diagnostic specimens, if these sources are
publicly available or if the information is recorded by the investigator in such a
manner that subjects cannot be identified, directly or through identifiers linked to
the subjects.

This approval expires on April 18, 2012. If the study continues beyond that date,
you must complete the appropriate portion of the IRB Renewal Application. If
you modify the application, please complete the Modification of an Approved
Protocol Form. Changes in this study cannot be initiated without IRB approval,
except when necessary to eliminate apparent immediate hazards to participants.
When the study closes, please complete the IRB Closure Form.

Should you need to submit any further correspondence regarding this application,
please include the assigned IRB application number.

Good luck with your research.

Sincerely,

Carpenter T. Myles, MSM, GIM
Director & Research Compliance Officer
Office of Research Compliance
The University of Alabama



Office of Research
Box 870231
Tuscaloosa, Alabama 35487-0231
205-148-8661
205-148-8982
205-148-8966