

**An Analysis of the Institutional Factors that Influence Retention and
6 - Year Graduation Rates at Historically Black Colleges and Universities**

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April 18, 2012

EXECUTIVE SUMMARY

Introduction and Problem Statement

The US college degree attainment statistics are troubling and are the source of employer and national concerns about America's ability to maintain economic and global competitiveness. Approximately 15.6 million new jobs are projected between now and 2016 and over half of those new jobs will require some form of advanced education or training. (CAP, 2008) While overall US graduation rates are stagnant at 50%, the average 6-year college completion rate for African American students nationwide is significantly lower at 42% (compared to 62% for their white peers).

For HBCUs with limited financial resources and endowments, this issue is especially acute. The 6-year graduation rate at HBCUs averages approximately 30%. Within the body of research on HBCUs, there are few studies that examine how institutional behavior and financial strategies (such as the allocation of resources) influence retention and graduation rates. In today's economic climate, institutional stakeholders are especially concerned with how 4-year institutions can increase productivity and allocate limited resources more efficiently.

This paper investigates the relationship between institutional characteristics (institutional selectivity, faculty and financial characteristics) and retention and 6-year graduation rates at Historically Black Colleges and Universities. Institutional financial characteristics (instructional, academic support, student services and institutional support expenditures) were examined from two perspectives: (1) The relationship between the amount of money spent per student and retention and graduation rates and (2) The relationship between the percentage of institutional expenditures and retention and graduation rates.

This study has two research questions:

1. Do institutional selectivity, faculty characteristics and financial characteristics spent per student significantly predict 6-year graduation rates at HBCUs and UNCF institutions?
2. Do institutional selectivity, faculty characteristics and the percentage of expenditures significantly predict first year retention rates at HBCUs and UNCF institutions?

Data and Methodology

The purpose of the quantitative analysis is to identify institutional characteristics influencing student retention and degree attainment at HBCUs. Data was collected from the National Center on Education Statistics' (NCES) Integrated Postsecondary Education Statistics Database (IPEDS). IPEDS collects information from all higher education institutions in the US that participate in federal student financial aid programs.

To address the research questions, I developed two data sets. The first data set is comprised of both public and private HBCUs (n=77) and the second data set includes UNCF (private; n=33) member institutions only. The outcome variables used are 2009 graduation rates¹ and 2004 1-year retention rates². The independent variables are from 2003, the base year in which students in the cohort enrolled in a specific institution for the first time. I selected explanatory variables based on factors that previous research studies have indicated are related to African American student degree completion in 4-year colleges and/or HBCU completion rates.

I estimate 6-year graduation rates and 1-year retention rates in 2009 for HBCUs in the sample using multiple linear-regression. This method assumes that the explanatory models affect all students within the sampled data in a similar way and moreover that each student within a given HBCU has the same likelihood of graduation and being retained through year one. While this method poses a limitation, the intended goal is to find the best fitting model to describe the relationship between graduation and retention rates and the explanatory variables/categories in the model.

Key Findings and Implications

This paper found that there is a relationship between institutional selectivity, faculty and financial expenditures on graduation and retention rates. When 6-year graduation rate was the variable of influence, percentage female, accreditation, open admission, and institutional support expenditures were found to be significant across both, the all HBCU and UNCF sets of data. In general there was a direct relationship between percentage female and graduation rates. This finding was consistent with much of the research on graduation rates that show that women graduate at higher rates than men. Institutional selectivity exerted a significant influence on graduation rates.

Institutions accredited by agencies recognized by the Department of Education are more likely to have higher graduation rates. This finding warrants more exploration to determine whether higher member standards by these agencies influence higher rates of graduation.

¹ Graduation rate data, 150% of normal time to complete – cohort year 2003 first time, full time students

² Percentage of students in Cohort Year 2003 who return to the institution in Fall 2004.

The retention model regressions were overall a weaker estimate of explaining the percentage variation in the outcome. In terms of student background the percentage female variable was a positive and significant influence for all HBCUs but this effect diminished for the UNCF only model. The percentage of students receiving federal grants did not significantly contribute to first year student retention for neither the all HBCU sample nor the UNCF sample data. UNCF member institutions fared no better in retaining cohort members from 2003-2004 than their public school counterparts. In terms of selectivity, accreditation and open admission status were both significant indicators of student retention.

Notably, percentage of instructional staff showed a negative and significant effect on retention rates at all HBCUs and UNCF institutions. This finding, a negative relationship between percentage of faculty assigned to instruction and first year retention, is informative and warrants exploration. If increasing the number of faculty dedicated to instruction negatively contributes to retention rates, institutions must evaluate more efficient allocation of instructors to maximize first year student retention. The FTE/student and percentage of expenditures models revealed no significant impact on first year retention. Considering HBCU financial characteristics, this finding may be more revealing of inadequate levels of available spending to influence retention rather than an indication of sufficient funding in each of the expenditure categories.

Implications

If improving retention and graduation rates is an institutional goal, then strategies to reduce institutional support expenditures and evaluate the percentage of staff dedicated to instruction is warranted. Similarly, the findings suggest directions for future research that may tease out some of the organizational, pedagogical and policy features of HBCUS.

There are important contrasts between the retention model findings for all HBCUS and for UNCF institutions. These contrasts suggest that UNCF institutions have different dynamics than all HBCUs and retention level strategies that work for one might not work for the other. When regressed alone, the retention model for UNCF institutions revealed no significant results for the variables of interest. On the other hand, for all HBCUs, accreditation, selectivity and instructional staff percentage had consistent significant effects.

Overall, institutional selectivity and institutional support expenditures appears to be an important determinant of graduation rates. Having an admissions policy (negative relationship) and accreditation recognized by the US Department of Education (positive relationship) significantly impacts 6-year graduation rates. The open admissions policy is potentially a sensitive issue for HBCUs because of a tradition of providing educational access to disadvantaged populations. However, an increasingly competitive higher education arena, flanked with the possibility of state and federal aid tied to graduation

outcomes, may necessitate a review of this policy and/or the institutional programs that support matriculating students entering under such a policy. Also, high expenditures in the institutional support category negatively impact graduation rates, suggesting that the current allocation of these overhead expenses deserves more scrutiny.

The percentage of instructional staff has a significant influence on first year retention rates. In general, higher percentages of instructional staff negatively impacted retention rates. This finding is somewhat surprising as we might expect more staff dedicated to classroom instruction to have a positive effect on student outcomes. This finding warrants more research into the specific ways institutions assign instructional responsibilities to professors, especially those who teach first year students.

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SECTION I

Policy Question

What institutional factors influence retention and 6-year graduation rates at Historically Black Colleges and Universities?

Problem Statement

College degree attainment in the United States has remained stagnant over the past four decades. (CAP, 2008) While the United States remains among the top 5 most educated G-20 countries in the world the country is ranked 15th in terms of degree attainment for adults aged 25-34 years old. (OECD, 2011) According to the National Center for Education Statistics (NCES), the country is significantly behind in making gains with this demographic. (NCES, 2011) Currently, only half of all US undergraduates complete a degree in 6 years and nearly 38% of all US students enroll in remedial courses in their freshman or sophomore year of college.³

The US college degree attainment statistics are troubling and are the source of employer and national concerns about America's ability to maintain economic and global competitiveness. Approximately 15.6 million new jobs are projected between now and 2016 and over half of those new jobs will require some form of advanced education or training. (CAP, 2008) While overall US graduation rates are stagnant at 50%, the average 6-year college completion rate for African American students nationwide is significantly lower at 42% (compared to 62% for their white peers).⁴ The 6-year graduation rate at HBCUs averages just 30%.⁵

Of the nation's 103 HBCUs, only 22% of the institutions exceed the national average for African American degree attainment. HBCUs comprise 4% of the all four-year institutions in the US yet, produce 21% of 4-year degrees award to African-American's in the nation. (NCES, 2011)

³ <http://www.ed.gov/news/speeches/meeting-president-obamas-2020-college-completion-goal>

⁴ <http://www.uncf.org/fdpatterson/Portals/0/FactSheetMay2010.pdf>

⁵ Author computed. NCES, Cohort Year 2003

A major challenge concerning United States higher education is how to improve and replicate degree attainment for African American and first generation college students. The 2020 College Completion goal necessitates the contribution of all higher education institutions, and especially the nation's Minority Serving Institutions (MSIs) in helping students most vulnerable to stopping out to graduate from college. HBCUs enroll approximately 312,000 students each year of which 80% are African American. While representing a relatively small percentage of US college students, HBCUs disproportionately serve large numbers of low-income and first-generation students who are overwhelmingly African-American and are strategically positioned to help support the nation's goal of producing a more educated workforce representative of the nation's population.

Post secondary education in the US is highly correlated with income earnings potential and access to the middle-class. Higher education stakeholders are engaging in strategies to realign the nation's previous emphasis on college access with renewed focus on college completion. In 2009, President Obama and the Department of Education announced the 2020 College Completion Goal to address the growing disparity. The 2020 College Completion Goal is focused on making America "the best educated, most competitive workforce in the world" which involves producing 10 million more college graduates⁶ by 2020⁷. (Ed.gov, 2011)

While the government shifts national attention on accelerating efforts to increase the number of students to pursue and earn post-secondary degrees, heightened attention is focused on increasing the number of minorities and students from low wealth and disadvantaged backgrounds who persist through and graduate from college. HBCUs enroll a disproportionate number of low socioeconomic status and African American students who might otherwise have limited access to college and are strategically positioned to positively impact the 2020 College Completion Goal.

As the costs associated with gaining a higher education continue to increase, institutional effectiveness and efficiency as measured by first-year retention and 6-year graduation rates is of major concern. Research focusing on the impact of college on students generally focuses on student characteristics and experiences rather than how institutional behavior contributes to retention and graduation. (Berger, 2000)

For HBCUs with limited financial resources and endowments, this issue is especially acute. Within the body of research on HBCUs, there are few studies that examine how institutional behavior and financial strategies (such as the allocation of resources) influence retention and

⁶ Includes 2year and 4 year colleges.

⁷ <http://www.ed.gov/news/speeches/meeting-president-obamas-2020-college-completion-goal>

graduation rates. In today's economic climate, institutional stakeholders (students, parents, university leaders and policy makers) are especially concerned with how 4-year institutions can increase productivity and allocated limited resources more efficiently⁸.

Purpose of the Paper

The purpose of this paper is to investigate the relationship between institutional characteristics (institutional selectivity, faculty and financial characteristics) and retention and 6-year graduation rates at Historically Black Colleges and Universities. Institutional financial characteristics (instructional, academic support, student services and institutional support expenditures) were examined from two perspectives: (1) The relationship between the amount of money spent per student and retention and graduation rates and (2) The relationship between the percentage of institutional expenditures and retention and graduation rates.

This study has two research questions:

1. Do institutional selectivity, faculty characteristics and financial characteristics spent per student significantly predict 6-year graduation rates at HBCUs and UNCF institutions?
2. Do institutional selectivity, faculty characteristics and the percentage of expenditures significantly predict first year retention rates at HBCUs and UNCF institutions?

The structure of this report is as follows. In Section I, I continue with a discussion of the relevant literature on HBCUs and the conceptual framework guiding this study. Section II summarizes the paper's data and methodology. In Section III, using institutional data from the National Center for Education Statistics' (NCES) Integrated Post-Secondary Education Statistics Database (IPEDS), I present the regression results of the institutional variables that inform first year retention and 6-year graduation rates at HBCUs and UNCF institutions. I conclude in Section IV, with a discussion of the key findings and implications for policy and further research.

⁸ Fisher, Karen. "A Crisis of Confidence Threatens Colleges: Rising costs test families' faith, while 1 in 3 presidents see academe on wrong road." *The Chronicle of Higher Education*. May 15, 2011.

Review of the Literature

Several studies have analyzed the effect of institutional characteristics on graduation rates. However, these studies are primarily focused on the larger body of higher education institutions and not specifically HBCUs. Black colleges and universities are rarely studied and when they are, they are usually positioned aside non-peer institutions or colleges. Considering the average student demographics and resource allocations of HBCUs, non-peer institution comparative studies are problematic, as they often do not account for the disproportionate impact that limited funding and student characteristics contribute to HBCU outcomes, most specifically graduation and retention rates. Accordingly, intragroup studies that evaluate similarly situated institutions are rare. To the extent possible this review highlights research relevant to HBCUs and/or the population of students served by the institutions. To supplement research on HBCUs, I also briefly discuss research more broadly based but only those studies most informative for my analysis of graduation and retention rates at HBCUs.

Studies about Students who attend HBCUs

While this study uses the institution as the unit of analysis, a review of literature on HBCUs must include a conversation on the types of students who are more likely to be enrolled in the institutions. Students enrolled in HBCUS are primarily from low-and middle-income households with 42% of students at the institutions coming from households with annual incomes of less than \$25,000. Not surprisingly, 66% of HBCU students are eligible for federal Pell Grants, and these students are twice as likely to receive federal funding awards that are 5% larger than those received by students enrolled at non-HBCUs. (Patterson Institute 2008)

Regarding academic indicators, HBCUs are said to play a critical role in helping to close the achievement gap among minority students by disproportionately educating students deemed academically underprepared for college as measured by standardized test scores. In the 2009-2010 academic year, HBCU students were shown to have critical reading and math scores 19 and 21 percent, respectively, lower than students at non-HBCUs. (Patterson Institute)

Freeman and Thomas (2002) analyzed data over three decades (from 1970-1990) and found that the profile of students selecting HBCUs has been somewhat consistent over the time period. Notably, they show that financial aid remains a major influencer on the type of institutions black students choose to attend. However, high school type and longing for a stronger cultural connection were also included as influential factors. The authors suggest that despite the average

student profile many HBCUs are able to attract the most academically competitive students if they can offer financial aid packages comparable to competing non-HBCUs.

Similarly, in their investigation of enrollment demand at HBCUs, Sissoko and Shiau (2005) found that the average cost of tuition and fees and the average Pell grant per student were significant factors influencing student selection of HBCUs. They also noted that federal policies and overall black population trends influenced matriculation. Accordingly, a rise in tuition suggested a decline in enrollment demand for HBCUs among black students. Thus, the research on the student profile of HBCUs suggests that success for the institutions' students is highly correlated with the number of students requiring remedial education, the availability of financial resources and the availability of support services that assist students with making a successful transition to the university environment. (Brock 2010) These student level characteristics are important to consider for further analysis on persistence and graduation rates at HBCUs.

Studies Indicating the Importance of Improving HBCU Graduation Rates

Considering the average demographic of HBCU students it is important to note why investing in research targeted at identifying factors that increase degree attainment at the institutions is important. Improving graduating rates at HBCUs has been shown to have positive economic impacts. Price (2011) found that HBCU graduates realize higher earnings relative to non- HBCU graduates and that attending an HBCU has produced positive psychological outcomes of graduates. The author suggests that this is an important theoretical consideration for labor market outcomes as HBCUs have a “comparative advantage in nurturing the self image, self-esteem and identity of its graduates”.

Mykerezi, Bradford and Gomes (2003) found that a high concentration of HBCUs in racially diverse rural counties contributed positively to the socioeconomic well being of the region and played a significant part of the increase in college education from 1990-2000. Notably, they found that having an HBCU within a 100-mile radius (as opposed to a non-HBCU) resulted in a 5.8% increase in degree attainment for residents.

In a 2006 study of the short-term economic impact of all 101 HBCUs, the Institute for Education Statistics reported that the combined initial spending of HBCUs in their host community totaled \$6.6 billion with a total economic impact of \$10.2 billion in 2001. The report affirmed that in terms of output, HBCUs would rank 232 on the Forbes Fortune 500 list of the largest companies in the United States.

The aforementioned show that HBCUs create economic impacts in terms of output, added labor income and employment. Conducting research charged with exploring factors that encourage increased student persistence and graduation rates at the institutions is an important component for the maintenance of the pivotal economic roles the institutions play in their local community and the nation.

In addition to the economic argument, HBCUs play an important role in preparing highly educated/skilled minority students to make positive contributions to the American workforce. In the nation's fastest growing sector, HBCUs currently confer approximately 28% of the bachelors degrees awarded to African Americans in the science, technology, engineering and math (STEM) fields. (Patterson Institute 2008) In terms of advanced degrees, eight of the top 10 colleges whose African American graduates pursued doctoral degrees in the STEM fields were HBCUs and 33 percent of African American PhDs in 2008 received their undergraduate degree from an HBCU. (National Science Foundation 2008) Identifying opportunities to improve graduation rates among HBCUs has great potential for not only increasing baccalaureate graduation rates but also the number of minority students who pursue advanced degrees; arguably an important component of ensuring America becomes the most highly educated workforce in the world.

Studies on HBCU Financial Resources and Characteristics

The average student profile, notwithstanding, chronic underfunding of HBCUs has also been associated with the institutions' reduced capacity to effectively graduate higher numbers of their students. For example, using quantitative analysis and investigating the potential existence of disparate funding treatment among public Predominately White Institutions (PWI) and HBCUs, Sav (2000) discovered that approximately 17% of the funding differential among the institutions was attributed to differential treatment (or fiscal discrimination). The author stops short of making any broad claims about the relevance of this finding but suggests that in order to receive funding parity a major redistribution of state funds would be necessary to put public HBCUs on par with their neighboring PWI institutions.

Ten years later, Sav (2010) reports a decrease in disparate funding among public HBCUs and PWIs down from 4.5% to 12.5% of the funding allocations attributed to discriminatory treatment. Sav suggests that if this decline is representative of progress, trend analysis projects that it would take approximately three decades to achieve funding parity among the institutions. If graduation rates are highly correlated with the amount of funding institutions have to invest in students, this time frame long exceeds the nations goals for college completion. Still, Sav intimates that this

narrowing in funding is potentially representative of a reversal of differential funding treatments with HBCUs actually being “favored with respect to certain performance measures.”

States have different tax bases and processes for allocating resources for higher education. Regardless of state differences, the discrepancy appears to remain stark. For example, in 2007, Auburn University in Alabama received an appropriation of \$228 million (\$9,446/student) compared with \$44.3 million (\$7,000/student) for Alabama A&M University (an HBCU). Similarly in the same year the University of North Carolina-Chapel Hill received nearly half a billion dollars (\$17,700/student) compared to \$88 million (\$8382/student) for North Carolina A&T university. (Minor 2008) Certainly enrollment numbers and degree types offered are key criteria that influence state funding allowances. However, some researchers suggest that typical allocation formulas omit factors that are very important to the HBCU context (such as the percentage of enrolled Pell-eligible students), resulting in these institutions getting fewer resources to serve students who need the most support. (Patterson Institute 2008, Gasman 2011) Minor (2008) argues that 35 years of equity litigation has been ineffective in eliminating the disparities in state funding among HBCUs and accordingly these institutions struggle to meet education outcomes, such as high graduation rates, for high need students with fewer resources.

Funding for the nation’s private HBCUs presents a different challenge because the institutions have access to limited public funding. Like public HBCUs, private HBCUs benefit from federal appropriations (via the Title III, B of the Higher Education Act), but these appropriations have not kept pace with the rate of inflation. (Wolanin 1998) Private institutions must rely primarily on student tuition and fundraising for revenue. To compound the funding issues, the majority of private HBCUs have small endowments that further restrict the institutions capacity to offer financial assistance to an increasingly high need student population. (Coupet and Barnum 2010, Patterson Institute 2008) Researchers offer evidence that show HBCUs have been highly efficient despite small endowments (Coupet and Barnum 2010) however, this finding provides little evidence in support of increased graduation and retention rates.

Studies on Retention, Persistence and Graduation Rates at HBCUs

Although, black student college graduation rates are 42% nationwide this number represents a slight increase over the past three years. (JBHE) African- American graduation rates at HBCUs tend to be lower than African American graduation rates at the nation’s highest-ranking PWIs. Allen (1992) suggests this difference in graduation rates is due to the difference characteristics of students enrolled at the perspective institutions. Similarly, Rawlston (2007) argues that HBCUs

willingness to offer more flexible admissions policies and collective history of educating disadvantaged students contributes to a disproportionate enrollment of students with low SES and varied high school achievement, factors highly correlated with college success.

Rawlston (2007) examined whether or not there were differences in graduation persistence and graduation rates of African American students at HBCUs and PWIs. She found no statistically significant differences in stop out rates for African American students between the institutions once she controlled for pre-college academic attributes and socioeconomic status. However, family background and academic performance and high school grades were found to be major influencers in African Americans persistence at all types of institutions.

On the other hand Allen (1992) found that African American students at HBCUs were much less likely to stop out than their counterparts at PWIs. His quantitative analysis of student and university characteristics revealed that the combination of these elements at HBCUs interacted to predict better academic performance, social integration and occupational aspirations for black students. However, similar to Rawlston, he argues that students' individual characteristics 'sizably' influenced academic achievement; although, the quality of life and university rules/procedures/resources (in addition to other observable and unobservable factors) also play a role.

In terms of academic achievement, Kim (2002), using writing and math ability as outcome measures, identified no significant differences between HBCU and PWI ability to influence academic ability in African American Students. Kim suggests that a "no difference" finding is a positive sign that black students' benefit equally in their academic development regardless of the type of institution they attend. Kim and Conrad (2006) found that African American students have a similar probability of obtaining a bachelors degree at HBCUs and PWIs. Using a national longitudinal data set and Hierarchal Linear Modeling to anchor their analysis, the authors intimate that despite the lack of resources HBCUs are as effective as PWIs and are able to produce the same level of outcomes as predominately white institutions.

General Studies on Institutional Characteristics and Graduation Rates

Porter (2000) found that average SAT scores and the percent of students who are female were associated with higher graduation rates. Ryan (2003) found that institutional expenditures on instruction and academic support have significant effects on student persistence and 6-year degree attainment. Similarly, Scott, Bailey and Kienzl (2004) found higher graduation rates at private

colleges and colleges with larger proportion of women and higher instructional expenditures per full time equivalent (FTE) student. Pascarella and Terenzini (1991) found that elements promoting social integration, such as residential campuses and smaller college size have positive impacts on student outcomes. The authors also suggest that institutional factors such as instructional expenditures and selectivity increase the likelihood of an increase in graduation rates. Gansemer-Topf and Schuh (2006) found that institutional selectivity and institutional expenditures contribute significantly to retention and graduation rates. Ehrenberg and Zhang (2004) found that non-tenured track positions adversely affect 6-year graduation rates for undergraduate students at 4-year colleges and universities.

Table 1 below summarizes the characteristics used in this paper that research has found to be associated with undergraduate graduation rates.

Table 1: Institutional Characteristics Associated with Degree Completion (and sample studies)

Explanatory Variable	Study	Hypothesized Effect
<i>%Female</i>	Porter (2000), Scott et. al (2004)	+
% of Pell Grants/Student Background	Rawlston (2007)	-/0
Institutional Selectivity	Rawlston (2007), Pascarella and Terenzini (1991)	+/-
Faculty Characteristics	Allen (1992), Pascarella and Terenzini (1991), Ehrenberg and Zhang 2004)	+
<i>Private Institution</i>	Scott, Bailey and Kienzl (2004)	+
<i>Institutional Financial Characteristics</i>	Sav (2000, 2010), Scott, Bailey and Kienzl (2004), Gansemer-Topf and Schuh 2006)	+/-

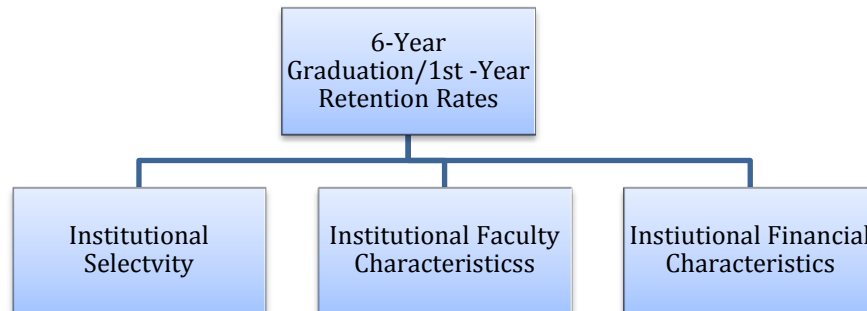
*+=positive effect; - = negative effect; 0 = neutral effect

Conceptual Framework

There are many strategies that could be used to improve graduation rates at HBCUs. (Turner 2004, Perna & Titus 2005) Research suggests that by increasing selectivity (the students accepted into the institutions) most 4-year institutions could show a marked increase in their graduation rates.⁹ However, for HBCUs such action may come at a cost to the institutions' historical missions of educating individuals with limited access to social mobility. (Abelman et. al 2009) This study draws influence from previous research (Berger and Braxton, 1998; Hamreck et.al, 2004; & Gansemer-Topf and Schuh, 2005) and explores the relationship between institutional selectivity, faculty and financial characteristics on 6-year graduation rates and first year retention rates at HBCUs.

Using multiple regression analysis, the conceptual framework guiding this paper is the idea that a combination of institutional characteristics and resource allocations (policies that HBCU administrators are more or less in control of) will have some explanatory power over graduation and retention rates. (Hamreck et. al 2004)

Figure 1: Conceptual Model for HBCU/UNCF Graduation and Retention Rates



⁹ "Placing College Graduation Rates in Context: How 4-Year College Graduation Varies with Selectivity and the Size of Low-Income Enrollment." NCES. November 16, 2006.

SECTION II: Data and Methodology

Data

Data was collected from the National Center on Education Statistics' (NCES) Integrated Postsecondary Education Statistics Database (IPEDS). IPEDS collects information from all higher education institutions in the US that participate in federal student financial aid programs. IPEDS has data for 99 of the 103 institutions classified as HBCUs and all 38 UNCF institutions are included within this number.

To address the research questions, I developed two data sets. The first data set is comprised of both public and private HBCUs and the second data set includes UNCF (private) member institutions only. After data analysis and dropping institutions not relevant to the project (community colleges, professional schools etc.) $n=77$ for all HBCUs (data set 1) and $n=33$ for UNCF schools (data set 2).

Tables 2 and 3 lists select descriptive statistics for the sampled data. Based on the descriptive data, approximately 85% of the students at HBCUs are black, 45% of the institutions are private HBCUs and nearly two thirds of the students receive Pell Grants. The 6-year graduation rate for the sample of all HBCUs and all UNCF institutions is approximately 30%. Appendix A summarizes the graduation rates of all institutions in the sample data sets.

Table 2: Select Descriptive Statistics for Sampled Data (HBCUs including UNCF)

Variable	Mean	Standard Deviation
% Female	59.11	11.76
% Black	87.25	15.71
% on Pell Grants	47.12	17.15
Avg. 6 Year Grad Rate	30.07	1.26
Avg. Tuition	\$16,750.91	3829.72
%UNCF Institutions (Private)	45.12	.50
Public HBCUs 6-Year Graduation Rate	30.24	12.28
Total Enrollment (Fall 2009)	2909.84	2384.25

N=77

Source: IPEDS, Author Collected Data

Table 3: Select Descriptive Statistics for Sampled Data (UNCF only)

Variable	Mean	Standard Deviation
% Female	59.18	10.65
% on Pell Grants	75.36	13.03
Avg. 6 Year Grad Rate	30.00	1.95
Openadmin	39.40	.4962
Total Enrollment (Fall 2009)	1454.79	981.64

N=33

Source: IPEDS, Author Collected Data

Methodology and Data Analysis

The purpose of the quantitative analysis is to identify institutional characteristics influencing student retention and degree attainment at HBCUs. The outcome variables used are 2009 graduation rates¹⁰ and 2004 1-year retention rates¹¹. The independent variables are from 2003, the base year in which students in the cohort enrolled in a specific institution for the first time. I selected explanatory variables based on factors that previous research studies¹² have indicated are related to African American student degree completion in 4-year colleges and/or HBCU completion rates. (Gasman 2011, Coupet and Barnum 2010, Flowers 2004)

Otherwise, I used research generally focused (Hosch, 2008; Gansemer-Topf and Schuh, 2005) on degree attainment at all 4-year colleges and the availability of variables in IPEDS to inform the selection of the independent variables. I have grouped the variables into three primary categories: institutional selectivity, faculty characteristics and institutional financial factors. I have also included covariates to control for student characteristics (percentage female and percentage receiving federal Pell grants) and institutional fixed characteristics (private institution and endowment level). Appendix B lists the dependent and independent variables and their definitions.

To answer the research questions, institutional financial factors (instruction, academic support, student services and institutional support expenditures), were assumed to impact graduation and retention rates over the course of a student's matriculation and so a mean expenditure value per student was calculated by summing the expenditures per FTE student starting

¹⁰ Graduation rate data, 150% of normal time to complete – cohort year 2003 first time, full time students

¹¹ Percentage of students in Cohort Year 2003 who return to the institution in Fall 2004.

¹² See Table 1: Institutional Characteristics Associated with Degree Completion

in 2003 (the beginning of the cohort year) and dividing by 6. To calculate the percentage of institutional expenditures, total institutional expenditures per student was calculated by adding total amount of institutional expenditures per FTE. Percentages for each institutional expenditure category were then obtained by dividing each financial category by the total institutional expenditures per FTE. Institutional expenditure percentages were included in an attempt to level the field between high wealth and low wealth institutions (as measured by endowment) or those with larger sources of revenues.

I estimate 6-year graduation rates and 1-year retention rates in 2009 for HBCUs in the sample using multiple linear regression. This method assumes that the explanatory models affect all students within the sampled data in a similar way and moreover that each student within a given HBCU has the same likelihood of graduation and being retained through year one. While this method poses a limitation, the intended goal is to find the best fitting model to describe the relationship between graduation and retention rates and the explanatory variables/categories in the model.

Prior to performing multiple regression techniques, the data sets were analyzed for adherence to the three general assumptions of multiple regression: (1) linearity (2) normal distribution and (3) homoscedasticity. Because of the small data sample sizes I also scanned for univariate outliers to account for the possibility of observations with extreme data points significantly distorting the data analysis. All observations within each data set were transformed into z-scores and any institution with a z-score of ± 2.00 was considered an outlier and omitted from the sample.¹³ (Gansemmer-Topf and Schuh, 2006)

Cooks distance was used to evaluate multivariate outliers and to determine the extent of influence that any one variable might have on the data set. Finally, in post-regression analysis, tolerance tests were run to test for multi-collinearity or the possibility that variables in the sample were gauging the same phenomenon and therefore exerting an unrealistic influence on the R^2 statistic.

¹³ This procedure resulted in the elimination of Spelman College (the HBCU with the highest graduation rate and largest endowment) and Morehouse College from both data sets; Arkansas Baptist College (lowest graduation rate) and Howard University from data set 1 (both public and private HBCUs) and Fisk University and Stillman College from the UNCF only data set.; I rely on a small deviation than Gansemmer-Topf who use ± 4.00 as the threshold to eliminate institutions.

SECTION III: RESULTS

Research Question 1: Do institutional selectivity, faculty characteristics and financial characteristics spent per student significantly predict 6-year graduation rates at HBCUs and UNCF institutions?

ALL HBCUS (Dependent Variable = 6-Year Graduation Rates)

Regression results indicated that the model was somewhat significant in predicting 6-year graduation rates. Student background characteristics ($R^2=.19$) had a significant effect on graduation. The percentage female variable significantly and positively contributed to graduation rates, while the percentage of students receiving federal grants had a significant but negative effect. The second model, institutional fixed ($R^2=.21$), contributes one binary variable (UNCF) in order to test for the effect of private HBCUs on graduation rate. Although, the student background characteristics remain significant, there is no effect of UNCF member status on graduation.

In terms of institutional selectivity ($R^2=.42$) the binary variable, Accredited, has a positive and statistically significant coefficient. Not surprisingly, having an open admissions policy has a negative, significant effect on the outcome variable. The addition of faculty characteristics ($R^2=.46$) does not have a significant impact on graduation rates. However, when all expenditures per student ($R^2=.53$) were added to the model the results differed. Although the coefficient (.00) is negligible instructional support expenditures has a positive and significant effect while institutional support expenditures has significant but negative effect. The results differ in the fully specified model including percentage of expenditures ($R^2=.54$). The percentage of instructional staff and institutional support variables both have negative and significant contribution to graduation rates. Table 5 summarizes the graduation model regression results for the sample data including all HBCUs.

Table 5: Graduation Model Regression Results (All HBCUs)

Variables	A Student Background	B Institutional Fixed	C Selectivity	D Faculty	E Expenditures/FTE Student	F Percentage of Expenditures
% Female	.46*** (.1398)	.46*** (.1394)	.29** (.1318)	.29* (.1322)	.30* (.1505)	.33** (.1347)
%Receiving Federal Grants	-.16** (.0739)	-.20** (.0813)	-.10 (.0733)	-.14 (.0818)	-.11 (.0846)	-.11 (.0804)
UNCF		3.06 (2.5474)	5.06* (2.3877)	5.99* (2.5083)	8.17** (2.5622)	9.42** (3.8837)
Accredit			6.96** (2.7779)	8.75** (3.1351)	5.78 (3.1740)	7.39** (3.1225)
Openadmin			-8.70*** (2.1026)	-6.85** (2.2729)	-6.00** (2.2949)	-6.62** (2.2101)
Tenure				-.03 (.0632)	-.04 (.0637)	-.08 (.0645)
% InstructionalStaff				-.19 (.1048)	-.18 (.1018)	-.20* (.1015)
Instruct					.00* (.0008)	18.43 (12.4602)
Acasup					.00 (.0013)	5.96 (23.4400)
Studserv					.00 (.0011)	4.38 (19.0142)
Instisup					-.00* (.0005)	-31.24** (10.4336)
Constant	13.14 (10.24)	14.60 (10.28)	14.76 (8.92)	23.29 (9.75)	16.68 (10.37)	22.01 (9.67)
Number of observations	77	77	77	72	72	72
R ²	0.19	0.21	0.42	0.46	0.53	0.54
*p<0.5, **p<.01, ***p≤.001						

UNCF INSTITUTIONS (Dependent Variable = 6-Year Graduation Rates)

Regression results indicated that the model was somewhat less significant in predicting 6-year graduation rates for UNCF institutions. Similar to the all HBCU data set, student background characteristics ($R^2=.36$) had a significant effect on graduation. The percentage female variable significantly and positively contributed to graduation rates, while the percentage of students receiving federal grants had a significant but negative effect. The second model, institutional fixed ($R^2=.38$), replaced the binary variable (UNCF) with the continuous variable Endow in order to test for the effect of private HBCU wealth on graduation rates. Although, the student background characteristics remain significant, there is no effect of institutional wealth on graduation.

In terms of institutional selectivity ($R^2=.65$) the binary variable, Accredited, has a positive and statistically significant coefficient. Not surprisingly, having an open admissions policy has a negative, significant effect on the outcome variable. The addition of faculty characteristics ($R^2=.67$) does not have a significant impact on graduation rates. However, when all expenditures per student ($R^2=.75$) were added to the model the results differed. Although the coefficient (.00) is negligible, institutional support expenditures positively and significantly impacts graduation rates. The results remain largely the same in the fully specified model for the percentage of institutional expenditures ($R^2=.76$). Percentage female, accreditation, open admission and the percentage of institutional support variables all have negative and significant contribution to graduation rates. Table 6 summarizes the graduation model regression results for the UNCF sample data.

Table 6: Graduation Model Regression Results (UNCF institutions only)

Variables	A Student Background	B Institutional Fixed	C Selectivity	D Faculty	E Expenditures/FTE Student	F Percentage of Expenditures
% Female	.49** (.1544)	.57** (.1720)	.47** (.1385)	.47** (.1557)	.53* (.2140)	.53** (.1656)
% Receiving Federal Grants	-.29* (.1273)	-.3274* (.1290)	-.23* (.1025)	-.18 (.1380)	-.09 (.1587)	-.12 (.1450)
Endow		-.00 (.0002)	-.00 (.0001)	-.00 (.0002)	-.00 (.0002)	-.00 (.0002)
Accredit			6.89* (3.0162)	8.94* (3.7058)	8.49* (3.5985)	8.56* (3.5041)
Openadmin			-8.14** (2.7764)	-8.00* (3.4190)	-8.16* (3.6295)	-8.79* (3.4757)
Tenure				-.01 (.1366)	-.01 (.1361)	-.01 (.1356)
% Instructional Staff				-.16 (.1327)	-.23 (.1385)	-.21 (.1340)
Instruct					.00 (.0010)	7.52 (12.3847)
Acasup					.00 (.0016)	3.47 (23.4400)
Studserv					.00 (.0015)	18.06 (18.8409)
Instisup					-.00* (.0006)	-23.03* (9.0505)
Constant	22.27 (13.73)	22.42 (13.74)	14.76 (8.92)	24.22 (11.87)	15.51 (13.19)	20.03 (12.82)
Number of observations	33	33	33	30	30	30
R ²	0.36	0.38	0.65	0.67	0.75	0.76
*p<0.5, **p<.01, ***p≤.001						

Research Question 2:

Do institutional selectivity, faculty characteristics and the expenditures of institutional expenditures significantly predict first year retention rates at HBCUs and UNCF institutions?

ALL HBCUS (Dependent Variable = Retention)

Regression results indicated that the model was somewhat significant in predicting one-year retention rates for the 2003 cohort. In contrast to the graduation rate results, only the percentage female variable in student background characteristics ($R^2=.16$) had a significant effect on retention. The percentage of students receiving federal grants had no effect. Likewise, the addition of UNC, in the institutional fixed model ($R^2=.16$), produced no effect.

In terms of institutional selectivity ($R^2=.27$) accreditation is no significant influence but having an open admissions policy has a highly significant and negative effect on retention. The addition of faculty characteristics ($R^2=.35$), and particularly, the percentage of instructional staff have a negative and significant impact. In this model, the accreditation variable shows up as positive and significant influence on retention. When all expenditures per student ($R^2=.39$) are added to the model the results remain largely the same; although the open admission variable is no longer significant. The results in the percentage of expenditures model ($R^2=.37$) are similar, with percentage of female students, accreditation, open admission and instructional staff percentage significantly impacting retention rates at HBCUs. Table 7 summarizes the retention model regression results for the sample data including all HBCUs.

UNCF INSTITUTIONS (Dependent Variable = Retention)

Regression results indicated that the model had little significance in predicting one-year retention rates for the 2003 cohort at UNCF institutions. The models for institutional selectivity ($R^2=.35$), faculty characteristics ($R^2=.43$) and expenditures per FTE student ($R^2=.52$) returned no statistically significant results. The percentage female variable returned positive and significant results when regressed with student background ($R^2=.26$) and institutional fixed ($R^2=.27$) characteristics but this significance disappeared in the remaining regressions. Regarding the percentage of expenditures model ($R^2=.52$) only the variable for percentage of instructional staff at the institutions had a significant (negative) impact. Table 8 summarizes the retention model regression results for the UNCF institutions sample data.

Table 7: Retention Model Regression Results (All HBCUs)

Variables	A Student Background	B Institutional Fixed	C Selectivity	D Faculty	E Expenditures/FTE Student	F Percentage of Expenditures
% Female	.47** (.1471)	.47** (.1481)	.35* (.1528)	.32* (.1524)	.36* (.0213)	.37* (.1648)
%Receiving Federal Grants	-.12 (.0778)	-.12 (.0864)	-.05 (.0850)	-.00 (.0942)	.02 (.1015)	.00 (.0983)
UNCF		.33 (2.7069)	1.74 (2.7683)	2.84 (2.8909)	3.61 (3.0755)	2.85 (4.7507)
Accredit			4.92 (3.2205)	8.64* (3.6133)	7.46* (3.8097)	7.61* (3.8196)
Openadmin			-6.49** (2.4377)	-5.79* (2.6196)	-5.02 (2.7545)	-5.69* (2.7035)
Tenure				-.05 (.0493)	-.09 (.0765)	-.08 (.0789)
% InstructionalStaff				-.32** (.1208)	-.29* (.1222)	-.31* (.1242)
Instruct					.00 (.0009)	11.72 (15.24)
Acasup					.00 (.0016)	2.36 (28.67)
Studserv					.00 (.0012)	11.53 (23.2590)
Instisup					-.00 (.0006)	-15.77 (12.7628)
Constant	45.85 (10.78)	46.01 (10.92)	46.14 (10.35)	54.11 (11.24)	16.68 (10.37)	51.70 (11.8299)
Number of observations	77	77	77	72	72	72
R ²	0.16	0.16	0.27	0.35	0.39	0.37
*p<0.5, **p<.01, ***p≤.001						

Table 8: Retention Model Regression Results (UNCF institutions only)

Variables	A Student Background	B Institutional Fixed	C Selectivity	D Faculty	E Expenditures/FTE Student	F Percentage of Expenditures
% Female	.49** (.1754)	.42* (.1720)	.33 (.1986)	.27 (.2169)	.51 (.3166)	.20 (.2500)
% Receiving Federal Grants	-.21 (.1433)	-.19 (.1476)	-.14 (.1470)	.04 (.1922)	-.10 (.2348)	.21 (.2265)
Endow		.00 (.0002)	-.00 (.0002)	-.00 (.0003)	-.00 (.0002)	.00 (.0003)
Accredit			7.29 (4.3253)	9.98 (5.1603)	9.75 (5.3237)	10.93 (5.2907)
Openadmin			-.60 (3.9813)	-.09 (4.7610)	2.37 (5.3695)	2.82 (5.2479)
Tenure				.13 (.1902)	.16 (.2013)	.24 (.2048)
% Instructional Staff				-.33 (.1848)	-.36 (.2048)	-.43 (.2023)
Instruct					.00 (.0015)	21.16 (18.6991)
Acasup					-.00 (.0024)	-42.36 (35.3912)
Studserv					.00 (.0022)	-4.66 (28.4471)
Instisup					-.00 (.0009)	-11.13 (13.6649)
Constant	51.53 (15.60)	51.40 (15.72)	50.65 (15.35)	48.45 (16.54)	31.49 (19.51)	41.37 (19.35)
Number of observations	33	33	33	30	30	30
R ²	0.26	0.27	0.35	0.43	0.52	0.52
*p<0.5, **p<.01, ***p≤.001						

SECTION IV: Discussion and Implications

Discussion

Research Question 1 - Graduation Models

This paper found that there is a relationship between institutional selectivity, faculty and financial expenditures on graduation and retention rates. When 6-year graduation rate was the variable of influence, percentage female, accreditation, open admission, and institutional support expenditures were found to be significant across both, the all HBCU and UNCF data sets. In general there was a direct relationship between percentage female and graduation rates. This finding is consistent with much of the research on graduation rates that show that women graduate at higher rates than men. Institutional selectivity exerted a significant influence on graduation rates. Institutions accredited by agencies recognized by the Department of Education are more likely to have higher graduation rates. This finding warrants more exploration to determine whether higher member standards by these agencies influence higher rates of graduation.

Not surprisingly, institutions with an open admissions policy had a negative and significant effect on graduation rates for both the general population of HBCUs and UNCF institutions. Certainly, HBCUs could improve graduation rates by toughening admissions criteria but this decision may come at a price to the institutions' historical missions and prevent access to first generation college students and historically underrepresented populations. On the other hand, for-profit institutions are providing African Americans with more flexible access to higher education, which suggests that some HBCUs may eventually be forced to reevaluate their approach in an increasingly competitive market of higher education providers.

Attending a private (UNCF) HBCU has a positive and significant influence on graduation rates. This finding aligns with research by Scott, Bailey and Kienzl (2004) that show that private schools and schools with larger proportions of women have higher graduation rates. While descriptive statistics showed marginal differences in the average graduation rates of public (30.05%) versus private HBCUs (30.11%) in the sample data of 77 institutions, the regression analysis suggests that this difference is large enough to exert a significant influence on the outcome variable. This finding is somewhat validated by a review of the HBCUs with the highest graduation rates.¹⁴ These institutions are overwhelmingly UNCF member colleges and a qualitative analysis of policies implemented by these institutions, controlling for institutional wealth, may be informative for

¹⁴ See Appendix A.

institutional leaders seeking to glean best practices for improving graduation rates. It is important to note that Spelman College, a UNCF institution with a graduation rate of 82%, the highest of all HBCUs, was excluded from the calculation of the sample averages in this report.

This paper revealed no statistically significant impact of faculty characteristics, as modeled by tenure and percentage of instructional staff, on graduation rates for either group of institutions. The exception was in the regression model (Table 5, Model F) that tested all HBCUs and percentage of expenditures. In this case, the percentage of instructional staff yielded a negative and significant effect on graduation rates.

Interestingly, this paper found that expenditures (per student or percentage) related to student services or academic support does not significantly contribute to 6-year graduation rates. This finding contrasts with Ryan (2003) who found that academic support expenditures have significant effects on student persistence and graduation. This finding may be influenced by this paper's focus on HBCUs. These institutions are overwhelmingly small institutions and the distinction between faculty roles and other institutional activities might be blurred. Additionally, generally focused research on student services suggests that a high percentage of these expenditures are directed towards administrative activities that have little to no impact on student outcomes such as graduation rates. (Massy, 2001) Alternatively, these results might suggest that the level of expenditures currently being allocated by institutions is simply not sufficient to exert an influence on student outcomes. Nevertheless, further exploration is warranted. If HBCU resource allocations in academic support and student services are not helping institutions meet expectations and goals, like supporting students with acclimating to the university environment, leaders should consider how to more adequately allocate these institutional resources for maximum benefit.

Finally, institutional support, expenditures allocated toward activities such as public relations and general administrative functions, negatively contributed to graduation rates for both HBCUs and UNCF institutions. This result is not surprising as these administrative activities do little to directly impact graduation rates. (Gansemer-Topf and Schuh 2006)

Research Question 2: Retention Models

The retention model regressions were overall a weaker estimate of explaining the percentage variation in the outcome. In terms of student background the percentage female variable was a positive and significant influence for all HBCUs but this effect diminished for the UNCF only model.

The percentage of students receiving federal grants did not significantly contribute to first year student retention for neither the all HBCU sample nor the UNCF sample data. UNCF member institutions fared no better in retaining cohort members from 2003-2004 than their public school counterparts. In terms of selectivity, accreditation and open admission status were both significant indicators of student retention.

Notably, percentage of instructional staff has a negative and significant effect on retention rates at all HBCUs and UNCF institutions. This finding, a negative relationship between percentage of faculty assigned to instruction and first year retention, is informative and warrants exploration. If increasing the number of faculty dedicated to instruction negatively contributes to retention rates, institutions must evaluate more efficient allocation of instructors to maximize first year student retention. However, this negative relationship may be indicative of institutional efforts to provide more support to students in the way of increased instructional staff. Still, it is difficult to decipher from the quantitative data the extent to which instructional staff are assigned to first year or upper level students.

The FTE/student and percentage of expenditures models revealed no significant impact on first year retention. Considering HBCU financial characteristics noted in the literature review, this finding may be more revealing of inadequate levels of available spending to influence retention rather than an indication of sufficient funding in each of the expenditure categories. Analysis of the within category budget lines (for example Academic Support may include expenditures for remedial tutoring) may prove more fruitful in determining the extent to which financial allocations impact first year retention at the institutions.

Implications

This study investigated the effect of percentage and per student expenditures on graduation and retention rates at HBCUs. Although these institutions may be limited in financial resources the results of this paper suggest that a review of expenditure categories and resource allocation strategies may help to improve institutional outcomes. If improving retention and graduation rates is an institutional goal, then strategies to reduce institutional support expenditures and evaluate the percentage of staff dedicated to instruction is warranted. Similarly, the findings suggest directions for future research that may tease out some of the organizational, pedagogical, and policy features of HBCUS. They are noted below:

There are important contrasts between the retention model findings for all HBCUS and for UNCF institutions. These contrasts suggest that UNCF institutions have different dynamics than all HBCUs and retention level strategies that work for one might not work for the other. When regressed alone, the retention model for UNCF institutions revealed no significant results for the variables of interest.

On the other hand, for all HBCUs, accreditation, selectivity and instructional staff percentage had consistent significant effects.

Overall, institutional selectivity and institutional support expenditures appears to be an important determinant of graduation rates. As noted earlier having an open admissions policy (negative relationship) and accreditation recognized by the US Department of Education (positive relationship) significantly impacts 6-year graduation rates. The open admissions policy is potentially a sensitive issue for HBCUs because of a tradition of providing educational access to disadvantaged populations. However, an increasingly competitive higher education arena, flanked with the possibility of state and federal aid tied to graduation outcomes, may necessitate a review of this policy and/or the institutional programs to support matriculating students entering under such a policy. Also, high expenditures in the institutional support category negatively impact graduation rates suggesting that the current allocation of these overhead expenses deserves more scrutiny.

The percentage of instructional staff has a significant influence on first year retention rates. In general, higher percentages of instructional staff negatively impacted retention rates. This finding is somewhat surprising as we might expect more staff dedicated to classroom instruction to have a positive effect on student outcomes. This finding warrants more research into the specific ways institutions assign instructional responsibilities to professors, especially those who teach first year students.

Limitations and Recommendations for Future Research

This study concluded that institutional selectivity, faculty and financial characteristics do have some influence on graduation and retention rates at HBCUs, but it has limitations. While robust and easily accessible, the IPEDS data excludes some key groups of students (part timers and transfer students) some researchers suggest are important subgroups on HBCU campuses. (Thurgood Marshall Fund 2009) Graduation rates are based only on first-time, full-time degree seeking freshman. To the extent that HBCUs enroll a significant number of part-time, transfer or other non-traditional students, the dependent variable might be biased downward. It was beyond the scope of this paper to address the different types of students stopping or dropping out of HBCUs (Hoyt and Winn 2004) but HBCU leaders suggest that the 6-year graduation rate is an unfair indicator of the institutions success as most students take longer to graduate.¹⁵ Alhberg and McCall (2005) reiterate this and show that students who stop-out from college are more likely to experience subsequent stop-outs and prolong graduation. Future studies should endeavor to determine the extent to which HBCU students stop out and re-enroll and how these actions impact graduation and retention rates at the institutions. Distinguishing between those institutions with and without open enrollment policies and an analysis of multiple cohorts of HBCU students may also be a worthwhile endeavor.

As discussed earlier, studies of HBCU graduation rates tend to stress the importance of student level characteristics. However, IPEDS is a cross-sectional institutional dataset and offers limited student level information. So, while previous research shows that HBCUs enroll a disproportionate number of low SES students, we cannot directly control for this phenomenon using the IPEDs data. In this study, I used percentage of students receiving federal grants as a proxy, but future studies should consider controlling for the variety of student level characteristics research indicates are important attributes of the HBCU student population.

This paper also examined general categories of expenditures that more or less predicted graduation rates at HBCUs. These categories (academic, student, instructional and institutional support expenditures) cover a variety of institutional offices and functions like library resources, student tutoring and counseling, and recruitment and retention activities. A more comprehensive study, including qualitative research methods may yield greater insight into how activities within each financial expenditure category contribute to HBCU student success. Additionally, this project's focus on HBCUs limits the entire possible sample to 104 institutions. IPEDS had recorded data for 99 institutions and further cleaning reduced the sample to 77 for all HBCUs and 33 for UNCF institutions. While I have attempted to account for the small sample in pre-and post regression

¹⁵ Stripling, Jack. "Data May Show HBCUs at Best/Worst." Inside Higher Education. April 23, 2010.

analysis, the small sample size may interfere with predicting the regression model, increasing standard errors and resulting in higher incidences of multi-collinearity. The data set constraints leave this study open to omitted variable bias. Finally, IPEDs collects data that is self-reported by the institutions, which may have resulted in numerical reporting errors.

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Appendix A: HBCU Graduation Rates, 2009

Spelman College	83	Grambling State University	
Howard University	62	Morris College	30
Morehouse College	60	Southern University and A & M College	30
Fisk University	57	Wilberforce University	30
Hampton University	52	Alabama A & M University	29
Bennett College for Women	48	Huston-Tillotson University	29
Saint Augustines College	48	Savannah State University	29
Claffin University	47	Dillard University	28
Jackson State University	47	Livingstone College	28
Elizabeth City State University	46	Paine College	28
Xavier University of Louisiana	46	West Virginia State University	28
North Carolina Central University	44	Lane College	25
Southwestern Christian College	44	University of Arkansas at Pine Bluff	25
Virginia State University	44	Voorhees College	25
Clark Atlanta University	43	Cheyney University of Pennsylvania	24
Albany State University	42	Kentucky State University	24
Tougaloo College	42	Rust College	23
Tuskegee University	41	Wiley College	23
Oakwood University	40	Alabama State University	22
Tennessee State University	40	Bluefield State College	22
Alcorn State University	39	Lincoln University	22
Bowie State University	39	Talladega College	22
Florida Agricultural and Mechanical University	39	Harris-Stowe State University	21
Johnson C Smith University	38	Miles College	21
Florida Memorial University	37	Philander Smith College	21
Lincoln University of Pennsylvania	37	Stillman College	21
North Carolina A & T State University	37	Allen University	19
Bethune-Cookman University	36	Central State University	19
South Carolina State University	36	Concordia College-Selma	19
Virginia Union University	36	Saint Pauls College	17
Winston-Salem State University	36	Le Moyne-Owen College	16
Mississippi Valley State University	35	Coppin State University	14
Delaware State University	34	Langston University	14
Shaw University	34	Edward Waters College	12
Fayetteville State University	32	Paul Quinn College	12
Morgan State University	32	Jarvis Christian College	11
Prairie View A & M University	32	Texas Southern University	11
University of Maryland Eastern Shore	32	University of the District of Columbia	11
Benedict College	31	Southern University at New Orleans	8
Norfolk State University	31	Texas College	8
Fort Valley State University	30	Arkansas Baptist College	5

*n=82, *UNCF Institutions*

Source: IPEDS, Author Collected Data

Appendix B: Description of Variables

Variables	Data Source	Description
DEPENDENT VARIABLES		
6 –Year Graduation Rate (2009)	IPEDS	Entering Fall 2003 Cohort
First Year Retention Rate	IPEDS	Cohort year 2003 –Percent returners in Fall 2004
INDEPENDENT VARIABLES		
<i>A: Student Characteristics</i>		
% Female	IPEDS	Percent of FTE that is female
%Receiving Federal Grants	IPEDS	Percent of students receiving federal Pell Grant aid
<i>B: Institutional Fixed Characteristics</i>		
Endow	IPEDS	Average per student endowment (2005-2009) for UNCF member institutions
UNCF	UNCF	Dummy variable indicating whether the institution is a private or public HBCU. Where 0=Public and 1=Private/UNCF
<i>Model 3: Institutional Selectivity</i>		
Openadmin	IPEDS	Dummy variable indicating whether the institution has an open admissions policy. Where 0=No and 1=Yes
Accreditation	IPEDS	Dummy variable indicating if the institution is accredited by any of the accrediting agencies recognized by the Secretary, US Department of education, which are on the list of national Institutional accrediting Bodies. 0=No, 1=Yes
<i>C: Faculty Characteristics</i>		
Tenure	IPEDS	Percent faculty with tenure status
Instructionalstaffperc		The percent of all employees whose primary responsibility is instruction or instruction/research/public service.
<i>D-E: Institutional Financial Characteristics</i>		
Instruct	IPEDS	Expenditures/FTE for instructional activities including, but not limited to, general academic instruction, community education and remedial and tutorial instruction conducted by the institution’s teaching faculty.
Acasup	IPEDS	Expenditures/FTE for academic services that support the institution’s primary mission. Including, but not limited to, library, technology, and course and curriculum development.
Studserv	IPEDS	Expenditures/FTE for admissions, registrar activities, and other activities whose primary purpose is to contribute to students’ emotional and physical well-being and to their intellectual, cultural and social development.
Instisup	IPEDS	Expenditures/FTE for the day to day operations of the institutions including, but not limited to, administrative support, executive planning, and public relations/development.
%Instruct	IPEDS	Percentage of expenditures for instructional activities including general academic instruction, community education and remedial and tutorial instruction conducted by the institution’s teaching faculty.
%Acasupperc	IPEDS	Percent expenditures for academic services that support the institution’s primary mission. Including, but not limited to, library, technology, and course and curriculum development.
%Studserv	IPEDS	Percentage of expenditures for admissions, registrar activities, and other activities whose primary purpose is to contribute to students’ emotional and physical well-being and to their intellectual, cultural and social development.
%Instisup	IPEDS	Percentage of expenditures for the day to day operations of the institutions including, but not limited to, administrative support, executive planning, and public relations/development.

Appendix C:

Percentage of Full Time Instructional Staff and 2009 Graduation Rates

(Bottom 6 and Top 6 low/high graduation rate institutions)

Institution	Instructional Staff	GR -2009
Arkansas Baptist College	58.5	5
Southern University at New Orleans	45.6	8
Texas College	38.8	8
Jarvis Christian College	27.3	11
Texas Southern University	41.3	11
University of the District of Columbia	51.5	11
Saint Augustines College	26.8	48
Hampton University	36.3	52
Fisk University	37.4	57
Morehouse College	37.8	60
Howard University	31.1	62
Spelman College	39.5	83

APPENDIX D: SUMMARY STATISTICS

Institution	Grad 6YR	Open Admin	Reten	Tenure	%Instructional Staff
Spelman College	83	0	92	45.7	39.5
Howard University	62	0	90	7.7	31.1
Morehouse College	60	0	84	37.8	37.8
Fisk University	57	0	82	47.1	37.4
Hampton University	52	0	83	34.5	36.3
Bennett College for Women	48	1	73	26.4	34.4
Saint Augustines College	48	0	73	26.7	26.8
Claflin University	47	0	74	19.1	34.6
Jackson State University	47	0	74	9.5	32.1
Elizabeth City State University	46	0	76	42.9	28.6
Xavier University of Louisiana	45	0	79	44.5	36
North Carolina Central University	44	0	78	26.2	28.2
Virginia State University	44	0	70	39.1	34.4
Clark Atlanta University	43	0	68	16.7	41.5
Albany State University	42	0	78	35.1	36.3
Tougaloo College	42	0	70	36.8	30.9
Tuskegee University	41	0	67	41.3	35
Oakwood University	40	0	69	23.1	34.5
Tennessee State University	40	0	79	42	39.8
Bowie State University	39	0	72	49.4	45.4
Florida Agricultural and Mechanical University	39	0	89	13.3	30.8
Alcorn State University	38	0	66	27.1	28.5
Johnson C Smith University	38	0	59	59.5	41.3
Florida Memorial University	37	0	69	33.6	52.8
Lincoln University of Pennsylvania	37	0	64	20.4	31.8
North Carolina A & T State University	37	0	73	75.4	34
Bethune-Cookman University	36	0	72	14.2	37.9

Institution	Grad 6YR	Open Admin	Reten	Tenure	%Instructional Staff
South Carolina State University	36	0	69	47.5	37.8
Winston-Salem State University	36	0	78	49.1	31.4
Mississippi Valley State University	35	0	74	44	23.6
Virginia Union University	35	1	60	28.6	50.7
Delaware State University	34	0	64	28.7	28.7
Shaw University	34	0	69	43.7	45
Fayetteville State University	32	0	73	50	32.4
Morgan State University	32	0	71	4.2	31.3
Norfolk State University	32	0	63	74	41.1
Prairie View A & M University	32	0	67	0	30.8
University of Maryland Eastern Shore	32	0	67	27.6	31.1
Benedict College	31	1	66	21.7	26.5
Fort Valley State University	31	0	78	54.5	19.6
Morris College	30	1	54	51.5	30.3
Southern University and A & M College	30	2	72	51.7	32.8
Wilberforce University	30	0	62	44.9	35.9
Alabama A & M University	29	0	64	34.4	32.2
Grambling State University	29	1	63	31.9	34
Huston-Tillotson University	29	0	58	37.6	42.1
Savannah State University	29	0	71	.	35.9
Dillard University	28	0	78	1.7	37.8
Livingstone College	28	0	67	3.2	25.3
Paine College	28	0	66	.	42.7
Langston University	27	1	56	40.8	62.2
Lane College	25	0	63	29	26.6
Lincoln University	25	1	54	55.2	32
University of Arkansas at Pine Bluff	25	0	62	43.1	34
Voorhees College	25	0	57	.	24.1

Institution	Grad 6YR	Open Admin	Reten	Tenure	%Instructional Staff
Bluefield State College	24	0	60	68.8	62.8
Cheyney University of Pennsylvania	24	1	55	58.1	37.6
West Virginia State University	24	1	58	32.3	54.1
Kentucky State University	23	0	60	12	25
Wiley College	23	1	54	4.3	30.3
Alabama State University	22	0	56	42.9	36.1
Talladega College	22	0	46	28.6	94
Harris-Stowe State University	21	0	53	43.2	36.3
Miles College	21	1	80	30.9	42.8
Philander Smith College	21	1	69	24.1	44.6
Stillman College	21	0	64	41.8	31.9
Allen University	19	1	62	.	47.1
Central State University	19	1	51	64.4	31.8
Rust College	18	1	57	15.4	24.4
Concordia College Selma	17	1	30	50.4	38
Saint Pauls College	17	0	53	53.2	23.2
Le Moyne-Owen College	16	1	97	40.4	40.6
Coppin State University	14	0	65	50.5	38.6
Edward Waters College	12	1	46	46.9	39
Paul Quinn College	12	0	86	20.5	34
University of the District of Columbia	12	1	65	.	51.5
Jarvis Christian College	11	1	57	40.2	27.3
Texas Southern University	11	1	59	50.8	41.3
Southern University at New Orleans	8	1	49	56.6	45.6
Texas College	8	1	32	3.4	38.8
Arkansas Baptist College	3	1	50	100	58.5

