

Analysis of Faculty Salaries at Historically Black Colleges and Universities

by

Sridhar Sitharaman

Bachelor of Technology

Indian Institute of Technology, 1983

Master of Business Administration

University of South Carolina, 1992

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Department of Educational Leadership & Policies

College of Education

University of South Carolina

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Major Professor

Committee Member

Committee Member

Committee Member

Dean of the Graduate School

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DEDICATION

To amma and appa.

ACKNOWLEDGEMENT AND DISCLAIMER

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ABSTRACT

Analysis of Faculty Salaries at Historically Black Colleges and Universities

Sridhar Sitharaman

Based on the NSOPF: 2004 and IPEDS data sets, this study used the Blinder-Oaxaca econometric wage decomposition techniques to examine faculty salaries at HBCUs and non-HBCUs. Akin to earlier research (NCES, 2004) that has reported that faculty salaries at HBCUs are 80% of faculty salaries at all institutions, this study also found the difference to be 17%.

Research questions addressed the faculty and institutional characteristics which previous research (Ashraf & Williams, 2008; Toutkoushian & Conley, 2005; Monks, 2003; Fairweather, 1995; Tuckman & Tuckman, 1976; and Cohn, 1973) have determined contribute to faculty salaries in the academic labor market, including faculty demographic, educational, productivity factors and institutional variables including type, location, resource, and Carnegie classification.

The Blinder-Oaxaca decomposition model explained 83%, and 76% of the salary gap using non-HBCU and HBCU coefficients as standard. The percentage of time spent on undergraduate instruction, faculty rank, Carnegie classification, research output, and average amount of institutional aid accounted for a major portion of the salary gap with non-HBCU salary structure as standard, and endowment per student explained a significant portion of the salary gap with HBCU salary structure as standard. Although HBCUs are teaching oriented institutions, teaching had no value at HBCUs. Research, especially funded activity, was more valued at HBCUs just as at non-HBCUs.

Few HBCUs award doctoral degrees. Additional analyses found that when all doctoral granting institutions were eliminated from the analysis, salaries were approximately 5% higher at HBCUs than at non-HBCUs, thus raising questions about the presumed inequity in salary levels and likely reasons for the discrepancy.

Dissertation Director: Dr. Julie Rotholz

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CHAPTER ONE

Nature and significance of the study

Introduction

The work of institutional researchers as related to faculty can be grouped into four broad categories: (1) external reporting of faculty data for the institution, (2) internal reporting of faculty data for the institution, (3) internal analyses of faculty data for administrators and stakeholders, and (4) scholarly research on faculty related issues (Toutkoushian, 2006). Institutional researchers have traditionally concentrated on the first two aspects of their work. Administrators at many institutions are now expecting institutional researchers to provide analyses on faculty issues for decision making. Faculty and administrators also request institutional researchers to give salary comparison information. Scholarly research on faculty can be done at the individual, departmental, institutional, regional, or national level. The goal of such studies is to understand the processes that affect faculty concerns such as their salaries, productivity, and satisfaction. This study addresses the first of these three areas.

Faculty salaries make up the single largest item in most university and college annual budgets (Hearn, 1999). There is no one-size-fits all approach to salary setting and salary structure. According to human capital theory, earnings should be a function of the skills and ability (“human capital”) of workers. A worker’s human capital is expected to rise with educational attainment and labor market experience. Therefore, earnings for faculty depend on their labor market experience, educational achievement and other

variables (Toutkoushian & Conley, 2005). Human capital theory explains some of the differences in faculty salaries but other differences are structural in nature. Structural theory examines the influence of the characteristics of the colleges and universities where faculty were trained and work, financial resources, student enrollment, tenure process, and collective bargaining agreements (Perna, 2001). Youn (1992) noted the academic labor market is segmented by academic discipline, job task (principal activity - teaching, research, administration), and job status (full-time or part-time). Faculty salaries also vary by institutional type (two year or four year), and institutional control (public or private). Few studies, however, have measured salary differences between historically black colleges and universities (HBCUs) and non-HBCUs.

Many HBCUs admit first generation minority students who may not get admitted into traditional institutions. Since the mid-1800s, HBCUs have educated students who have become leaders in government, business, education, science, military, law, and many other fields (Reed, 2008). HBCUs graduate a high number of African American and low-income students every year. Although they represent about 3% of all institutions, HBCUs graduate approximately 30% of all African-American students; 40% of African-American students receiving a four-year degree in science, technology, engineering, and mathematics; and 50% of African-American teachers. Despite these successes, in 2008 HBCUs will receive only meager increases in federal funding and significantly less funding for research, facilities, and programs compared to predominantly white institutions. According to a National Science Foundation report issued in October 2007, six of the top 20 predominantly white institutions received more federal funds for research than 79 HBCUs combined. The National Science Foundation

report indicated that in spite of the irrefutable record of success at educating African-American scientists and engineers, HBCUs continue to receive disproportionately less federal funding. This practice reaffirms the Matthew effect proposed by Merton (1988) that the eminent get disproportionately greater credit for their contributions while the relatively unknown tend to get disproportionately little for their occasionally comparable contributions. This pattern of inequity in funding makes it difficult for HBCUs to remain competitive with predominantly white institutions (Baskerville, 2008). Further, the federal budget for the 2009 fiscal year would reduce funds for HBCUs and other minority-serving institutions by \$85 million, or 35% as compared to 2008 levels. That would place federal spending for HBCUs at the same level as in 2007 (Basken, 2008).

One of the largest expenditures for higher education institutions is faculty salaries, and HBCUs are no exception. However, keeping salaries of faculty comparable to those in other institutions has been a serious problem considering the history of inequity in funding for HBCUs (Evans, Evans, and Evans, 2002). A study based on the 2001-2002 American Association of University Professors data reported that none of the full professors at any HBCU had an average salary that was as high as the national average. Throughout the South, full professors at public HBCUs earned significantly less than full professors at public non-HBCUs in the same state. The largest differences were in North Carolina and Virginia, and the least differences were in Florida, Louisiana, and Tennessee. The present study has the geographical location of the institution as one of the predictors of faculty salary (Vital Signs, 2002).

Even a subsequent study by the National Center of Education Statistics (NCES, 2004), found the average salaries of full-time instructional faculty on 9-month contracts

at HBCUs to be 81% of other institutions. This statement is misleading because a majority of HBCUs are in the Carnegie Masters or Bachelors classification and there are very few in the Carnegie Doctoral classification, while there is a substantially higher percentage of Carnegie Research and Carnegie Doctoral non-HBCU institutions. The observed difference in average salaries can be due to many factors such as Carnegie classification, type of institutional control, geographical location of the institution, the faculty members' academic discipline and experience. Nonetheless, all faculty salary studies do not fully explain the salary differentials.

The Blinder- Oaxaca (1973) wage decomposition econometric model has been used widely to explain the difference in salaries between gender, race, and social groups in labor markets including colleges and universities in developed and developing countries (Ashraf, 1996; Ashraf, 2006; Barbezat & Hughes, 2005; Bloch & Smith, 1977; Boras & Rodgers, 2003; DeLeire, 2001; Ginther & Hayes, 2003; Rhee, 1997; and Toutkoushian & Conley, 2005). The Blinder-Oaxaca decomposition method is used to statistically separate the wage gaps due to actual differences between two populations and differences due to employer preferences. While this model has been widely used to study gender and racial discrimination, it can also be used to look at different preferences between two groups of employers (Harris, 2003). This method has been used in studies other than salaries also. The model has also been used to explain differences in mathematics and Spanish achievement between students in Mexico and Cuba (McEwan & Marshall, 2004). This study will use the Blinder-Oaxaca model to statistically separate the salary gap due to differences in characteristics of HBCU and non-HBCU faculty, and differences in the reward structures of HBCUs and non-HBCUs.

Statement of the Problem

The average of faculty salaries at HBCUs is about 80% of those at all institutions (NCES, 2004). According to human capital theory, earnings should be a function of the skills and ability possessed by workers. Most observers of higher education agree that faculty salaries should be a function of training, experience, quantity and quality of scholarly productivity and teaching load. The purpose of this research is to study the determinants of faculty salaries at HBCUs and explore the utility of the Blinder-Oaxaca econometric wage decomposition model to explain the difference in the average salary of faculty at HBCUs and the average salary of faculty at non-HBCUs.

Research questions

The research questions for this study are:

- 1) To what extent do characteristics of faculty at HBCUs differ from characteristics of faculty at non-HBCUs (in terms of education, employment, demographics, productivity, and institution variables)?
 - a) What are the characteristics of faculty at HBCUs?
 - b) What are the characteristics of faculty at non-HBCUs?
- 2) To what extent do the salaries of faculty at HBCUs and non-HBCUs differ with respect to the education, employment, demographics, productivity, and institution variables?
 - a) What are the determinants of faculty salary at HBCUs?
 - b) What are the determinants of faculty salary at non-HBCUs?
- 3) To what extent does the Blinder-Oaxaca wage decomposition model explain the salary differential between faculty at HBCUs and non-HBCUs?

Limitations of the study

As with any investigative research, this study has some limitations.

- 1) This study is based on the survey done during the 2003-2004 academic year, so the results will only give a snap-shot of the information during the 2003 – 2004 academic year. Subsequent changes like reduced state and federal funding or faculty retirement and mobility have no effect on this study because this is not a longitudinal study.
- 2) The NSPOF data from the faculty survey is self reported. Faculty responded to the survey in the spring semester to questions pertinent to the previous fall semester. There may be some error in recalling information.
- 3) The variables that can be selected for analysis in this study are restricted to the variables available in the NSOPF survey. At the same time, all available and possible variables cannot be included in the study, because it can lead to multicollinearity in regression analysis. This occurs when variables are highly correlated with each other and do not add any value to the study. In other words, the information in one variable is already available in another variable and is redundant. Institutional finance variables like total assets, total liabilities, and size of endowment are not available in the NSOPF survey. To overcome this limitation, institutional finance data like endowment, total assets, and total liabilities were merged from the IPEDS Finance survey.

Delimitations

The study includes only full time faculty in four year institutions with instructional duties and faculty status, whose principal activity is teaching, research, or administration; who have a 9/10 month contract or 11/12 month contract; who have attained the rank of Professor, Associate Professor, or Assistant Professor; and who hold

an earned doctorate, first professional or masters degree. Researchers using the NSOPF 1999 data set had restricted the minimum salary as \$10,000 or \$20,000 and maximum salary as \$250,000 or \$300,000 to eliminate outliers (Toutkoushian, Bellas, & Moore, 2007; Melguizo & Strober, 2007; and Monks, 2003). In the present study, the minimum and maximum annual salary has been set at \$10,000 and \$250,000 to remove outliers.

Conceptual Framework of the study

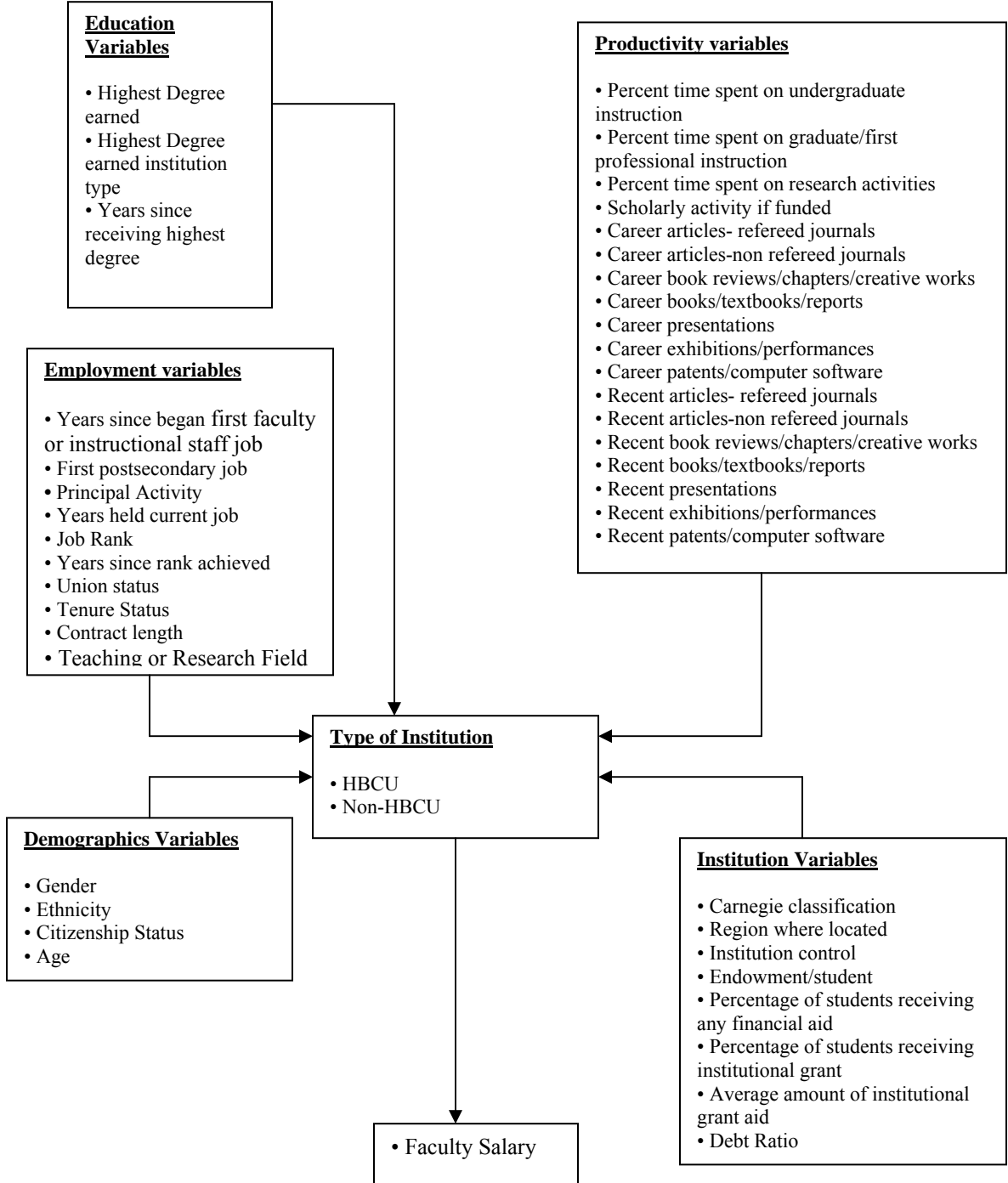
Faculty salaries depend on many variables and vary in HBCU and non HBCU institutions. The faculty salary related variables selected in the study are grouped into five different categories as shown in Figure 1. The five groups are education, employment, demographics, productivity, and institution variables. The variables are:

- 1) Education variables – highest degree earned, Carnegie classification of the institution where highest degree was earned, years since receiving highest degree.
- 2) Employment variables – years since began first faculty or instructional staff job, first postsecondary job, principal activity, years held current job, job rank, years since rank achieved, union status, tenure status, contract length, teaching or research field
- 3) Demographics variables - gender, ethnicity, citizenship status, age.
- 4) Productivity variables – percent time spent on undergraduate instruction, percent time spent on graduate/first professional instruction, percent time spent on research activities, funded scholarly activity, career articles in refereed journals, career articles in non refereed journals, career book reviews/chapter/creative works, career books/textbooks/reports, career presentations, career exhibitions/performances, career patents/computer software, recent articles in refereed journals, recent articles in non refereed journals, recent book reviews/chapter/creative works, recent

books/textbooks/reports, recent presentations, recent exhibitions/performances, and recent patents/computer software.

5) Institution variables – Carnegie classification, region where located, institution control, endowment per student, percentage of students receiving any financial aid, percentage of students receiving institutional grant, average amount of institutional grant, and debt ratio.

Figure 1. Conceptual Model of Faculty Salaries



Significance of the Study

The significance of this study is threefold.

- 1) It adds to the literature on HBCUs and HBCU faculty salaries.
- 2) It adds to the literature on studies based on the NSOPF data set.
- 3) It tests the utility of the Blinder-Oaxaca decomposition model to explain the difference in salary between faculty at HBCUs and non-HBCUs.

The National Study of Postsecondary (NSOPF) provides data about salary, education, experience, workload, productivity of higher education faculty that is not available in other faculty salary surveys like Integrated Postsecondary Data System (IPEDS), American Association of University Professors (AAUP), College and University Professional Association for Human Resources (CUPA-HR), and Oklahoma State Faculty Salary Survey. The NSOPF surveys have been used extensively in faculty salary and faculty satisfaction studies. The 2004 version of the NSOPF data set has been used to study faculty satisfaction with instructional autonomy at community colleges (Kim, Twombly, & Wolf-Wendel, 2008). The 1993 and 1999 versions of the NSOPF survey have been used to study the contribution of HBCUs to prepare African Americans for faculty careers (Perna, 2001) and differences in research productivity of faculty in HBCUs and non-HBCUs (Betsey, 2007). The NSOPF survey has not been used to study faculty salaries at HBCUs. Thus this study fills a vital niche in the higher education literature both in enriching understanding of faculty salary variables and conditions in HBCUs.

There are no known studies in the literature that have looked at the satisfaction and turnover rate of faculty at HBCUs. Retaining faculty at HBCUs by offering better

salaries is all the more important considering the limited supply of African American faculty in the academic labor market. There are very few African Americans receiving Ph.D.s annually. According to National Opinion Research Center (NOPRC, 2006) based on the Survey of Earned Doctorates in 2006, African Americans accounted for only 1,659 or 3.6% of the 46,596 Ph.D.s awarded. Most of the African Americans, or 606, received doctorates in education, many of whom work for K-12 school systems instead of colleges and universities. Betsey (2007) reported that faculty at HBCUs were significantly older than faculty at predominantly white institutions. He further added that if faculty interested in teaching at HBCUs are not produced, or if such faculty are not retained, there may be a shortage of African American faculty at the same time the baby boom echo generation is approaching college. This could affect the fate of HBCUs and the students interested in attending such institutions.

According to NCES (2006), the total economic impact of all the HBCUs in the U.S. in 2001 was \$10.2 billion. The total employment impact of the HBCU institutions included 180,142 full- and part-time jobs in 2001. This employment impact exceeds the 177,000 jobs at the Bank of America in 2006, which is the nation's 23rd largest private employer. It would be unfortunate if HBCUs are forced to close due to financial or accreditation problems.

Brown & Freeman (2002) reported that HBCUs have existed for over 100 years without being serious subjects for academic research. Research regarding HBCUs is limited and there are significant gaps in the literature. Because of the void in the literature, neither educators and policy makers nor higher education institutional researchers have been able to cite fresh academic thinking about the practices, successes,

and /or challenges of HBCUs. There is a need for a contemporary body of literature which addresses issues of HBCUs. This study provides a much needed contribution to current literature on HBCUs.

Although it is well known that the average faculty salary at HBCUs is lower than that of faculty at other institutions, there is no study that identifies the factors contributing to this salary discrepancy. All studies that report the low faculty salary level at HBCUs are based on institutional level data. This study will use individual level National Study of Postsecondary Faculty (NSOPF): 2004 data to identify the factors contributing to this salary discrepancy. By using the Blinder-Oaxaca decomposition technique, this study will identify the percentage difference in salary between faculty at HBCUs and non-HBCUs due to such variables as gender, ethnicity, job rank, primary teaching field, highest qualification, tenure status, and a range of scholarly and professional activities.

Institutions award salaries on a highly discretionary basis. This study can be used to give some structure to the salary setting process to give the faculty the feeling of a direct connection between qualification and salary. Faculty at HBCUs can use this study to get a revised salary schedule through a bargaining group. Administrators at HBCUs can raise important policy questions about what qualifications are valued by the institution and how much they are rewarded (Moore, 1993). Administrators at HBCUs can use the results of this study in their own institutional salary studies and ultimately to recommend salary structures that will assist their institutions in the recruitment of the most qualified faculty available. HBCU administrators can use the results of the study to lobby for more equitable government funding and in fund raising for endowed faculty chairs. Other agencies like the United Negro College Fund that are involved in fund

raising on behalf of HBCUs can also use this study in their fundraising efforts. Think tanks involved with issues on African American education like the Frederick Patterson Research Institute and Thurgood Marshall College Fund will also find this study relevant for further analysis.

Definitions

This study used the following terms from the Integrated Postsecondary Education Data System, Carnegie type classifications, and explains the terms in the National Study of Postsecondary Faculty survey.

IPEDS: The Integrated Postsecondary Education Data System collects institution-level data from postsecondary institutions in the United States and other jurisdictions, such as Puerto Rico. A postsecondary institution is any organization open to the public and has provision of postsecondary education as its primary mission. Participation in the IPEDS is a requirement for the 6,700 institutions participating in Title IV federal student aid programs such as Pell Grants or Stafford Loans. Data collected from the institutions are in the areas of enrollments, program completions, graduation rates, faculty, staff, finances, institutional prices, and student financial aid.

Carnegie Classification Code

1994 Carnegie Classification

Research Universities I: These institutions offer a full range of baccalaureate programs, are committed to graduate education through the doctorate, and give high priority to research. They award 50 or more doctoral degrees each year. In addition, they receive annually \$40 million or more in federal support.

Research Universities II: These institutions offer a full range of baccalaureate programs, are committed to graduate education through the doctorate, and give high priority to research. They award 50 or more doctoral degrees each year. In addition, they receive annually between \$15.5-million and \$40-million in federal support.

Doctoral Universities I: In addition to offering a full range of baccalaureate programs, the mission of these institutions includes a commitment to graduate education through the doctorate. They award at least 40 doctoral degrees annually in five or more disciplines.

Doctoral Universities II: In addition to offering a full range of baccalaureate programs, the mission of these institutions includes a commitment to graduate education through the doctorate. They award annually at least 10 doctoral degrees in three or more disciplines or 20 or more doctoral degrees in one or more disciplines.

2000 Carnegie Classification

The 2000 Carnegie Classification includes all colleges and universities in the United States that are degree-granting and accredited by an agency recognized by the U.S. Secretary of Education. The 2000 edition classifies institutions based on their degree-granting activities from 1995-96 through 1997-98.

Doctoral/Research Universities--Extensive: These institutions typically offer a wide range of baccalaureate programs, and they are committed to graduate education through the doctorate. They award 50 or more doctoral degrees per year across at least 15 disciplines.

Doctoral/Research Universities--Intensive: These institutions typically offer a

wide range of baccalaureate programs, and they are committed to graduate education through the doctorate. They award at least ten doctoral degrees per year across three or more disciplines, or at least 20 doctoral degrees per year overall.

Master's Colleges and Universities I: These institutions typically offer a wide range of baccalaureate programs, and they are committed to graduate education through the master's degree. They award 40 or more master's degrees per year across three or more disciplines.

Master's (Comprehensive) Colleges and Universities II: These institutions typically offer a wide range of baccalaureate programs, and they are committed to graduate education through the master's degree. They award 20 or more master's degrees per year.

Baccalaureate Colleges--Liberal Arts: These institutions are primarily undergraduate colleges with major emphasis on baccalaureate programs. They award at least half of their baccalaureate degrees in liberal arts fields.

Baccalaureate Colleges--General: These institutions are primarily undergraduate colleges with major emphasis on baccalaureate programs. They award less than half of their baccalaureate degrees in liberal arts fields.

Endowment assets: Gross investments of endowment funds, term endowment funds, and funds functioning as endowment for the institution and any of its foundations and other affiliated organizations.

Total assets: Total assets is the sum of the following amounts: cash, cash equivalents and temporary investments; receivables (net of allowance for uncollectible accounts); inventories, prepaid expenses, and deferred charges; amounts held by trustees

for construction and debt service; long-term investments; plant, property, and equipment; and other assets.

Total liabilities: Total liabilities is the sum the following amounts: accounts payable; deferred revenues and refundable advances; post-retirement and post-employment obligations; other accrued liabilities; annuity and life income obligations and other amounts held for the benefit of others; bonds, notes, and capital leases payable and other long-term debt, including current portion; government grants refundable under student loan programs; and other liabilities.

Endowment assets: Consists of gross investments of endowment funds, term endowment funds, and funds functioning as endowment for the institution and any of its foundations and other affiliated organizations.

Instructional duties- During the 2003 Fall Term, did you have any instructional duties such as teaching students in one or more credit or noncredit courses, or advising or supervising students' academic activities?

0 = No, 1 = Yes

Faculty status- During the 2003 Fall Term did you have faculty status as defined by your institution?

0 = No, 1 = Yes

Principal activity- Was your principal activity during the 2003 Fall Term. . .

(If you had equal responsibilities, please select one.)

1 = Teaching, 2 = Research, 3 = Public service, 4 = Clinical service

5 = Administration (e.g., Dean, Chair, Director, etc.)

6 = On sabbatical from this institution

7 = Other activity (e.g., technical activity such as programmer or technician; other institutional activities such as library services; subsidized performer, artist-in-residence, etc.)

Employed full or part time at this institution- During the 2003 Fall Term, did your institution consider you to be employed full time or part time?

1 = Full time, 2 = Part time

Rank- During the 2003 Fall Term, was your academic rank, title, or position (If no ranks are designated at your institution, select "Not applicable.")

0 = Not applicable (No formal ranks are designated at this institution)

1 = Professor, 2 = Associate professor, 3 = Assistant professor

4 = Instructor, 5 = Lecturer

6 = Other title (e.g., Administrative, Adjunct, Emeritus, other)

Tenure status- During the 2003 Fall Term were you . . .

1 = Tenured, 2 = On tenure track but not tenured

3 = Not on tenure track, 4 = Not tenured because institution had no tenure system

Union status- Are you a member of a union or other bargaining association that is legally recognized to represent the faculty at your institution?

0 = No, 1 = Yes

Highest degree- What is the highest degree you have completed? Do not include honorary degrees.

(If you have none of the degrees or awards, select "Not applicable.")

0 = Not applicable (Do not hold a degree), 1 = Doctoral degree (Ph.D., Ed.D., etc.)

2 = First-professional degree (M.D., D.O., D.D.S. or D.M.D., LL.B., J.D., D.C.

or D.C.M., Pharm.D., Pod.D. or D.P., D.V.M., O.D., M.Div. or H.H.L. or B.D.)

3 = Master of Fine Arts, Master of Social Work (M.F.A., M.S.W.)

4 = Other master's degree (M.A., M.S., M.B.A, M.Ed., etc.)

5 = Bachelor's degree (B.A., A.B., B.S., etc.)

6 = Associate's degree or equivalent (A.A., A.S., etc.)

7 = Certificate or diploma for completion of undergraduate program (other than associate's or bachelor's)

First postsecondary job, current job is first- Is the job you held at the institution during the 2003 Fall Term the first faculty or instructional staff position you have held at a postsecondary institution? Do not include teaching assistant or research assistant positions while you were working on your degree.

0 = No, 1 = Yes

Percent time spent on instruction, undergraduate- What percentage of your time was spent on Instructional Activities with Undergraduates, including teaching and preparing for classes, advising, and supervising students at this institution?

Percent time spent on instruction, graduate/first-professional- What percentage of your time was spent on Instructional Activities with Graduate and First Professional students, including teaching and preparing for classes, advising, and supervising students at this institution?

Percent time spent on research activities- What percentage of your time was spent on Research Activities, other forms of scholarship, or grants at this institution?

Career articles, refereed journals- During your entire career, how many of the following have you completed? (If not sure, give your best estimates.) articles published in refereed professional or trade journals; or creative works published in juried media?

Career articles, nonrefereed journals- During your entire career, how many of the following have you completed? (If not sure, give your best estimates.) articles published in nonrefereed professional or trade journals; or creative works published in nonjuried media or in-house newsletters?

Career book reviews, chapters, creative works- During your entire career, how many of the following have you completed? (If not sure, give your best estimates.) published reviews of books, articles, or creative works; or chapters in edited volumes?

Career books, textbooks, reports- During your entire career, how many of the following have you completed? (If not sure, give your best estimates.) Textbooks, other books; monographs; research or technical reports disseminated internally or to clients?

Career presentations- During your entire career, how many of the following have you completed? (If not sure, give your best estimates.) Presentations at conferences, workshops, etc.?

Career exhibitions, performances- During your entire career, how many of the following have you completed? (If not sure, give your best estimates.) Exhibitions or performances in the fine or applied arts?

Career patents, computer software- During your entire career, how many of the following have you completed? (If not sure, give your best estimates.) Patents and computer software products

Recent articles, refereed journals- Of the articles or creative works published in refereed journals or juried media in your career, how many were done in the last two years?

Recent articles, nonrefereed journals- Of the articles or creative works published in nonrefereed journals or nonjuried media in your career, how many were done in the last two years?

Recent book reviews, chapters, creative works- Of the reviews of books, articles, or creative works; chapters in edited volumes published in your career, how many were in the last two years?

Recent books, textbooks, reports- Of the textbooks, other books; monographs; and client reports you published during your career, how many were done in the last two years?

Recent presentations- Of the presentations you made at conferences or workshops in your career, how many were made in the last two years?

Recent exhibitions, performances- Of the career exhibitions or performances, how many were in the last two years?

Recent patents, computer software- Of the career patents, software products, or other works, how many were done in the last two years?

Scholarly activity, any funded- During the 2003–04 academic year, are any of your scholarly activities (Basic research, Applied or policy-oriented research or analysis, Literary, performance, or exhibitions, Program and curriculum design and development, Other) at your institution funded? Do not include consulting services and research included as part of your basic salary. 0 = No, 1 = Yes

Amount of income from basic salary from institution- What is your basic salary during the 2003 calendar year from this institution?

Type of contract, length of unit- Is your basic salary at [FILL INSTNAME] this academic year based on a 9– or 10–month contract, an 11– or 12–month contract, or some other arrangement?

Gender- Are you . . . 1 = Male, 2 = Female

Citizenship status- Are you a United States citizen? 0 = No, 1 = Yes

Geographic regions

New England - CT, ME, MA, NH, RI, VT

Mid East - DE, DC, MD, NJ, NY, PA

Great Lakes - IL, IN, MI, OH, WI

Plains - IA, KS, MN, MO, NE, ND, SD

Southeast - AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV

Southwest - AZ, NM, OK, TX

Rocky Mountains - CO, ID, MT, UT, WY

Far West - AK, CA, HI, NV, OR, WA

Non-HBCUs: The term Non-HBCUs, has been used in the literature as an alternative for predominantly white institutions (PWIs). Some of the studies that have used the term non-HBCUs are Betsy (2007), Agesa, Granger & Price (2002), and Redd (2000).

This section provided an introduction to the study and reviewed the Statement of the Problem, Research questions, Limitations of the study, Delimitations, Conceptual Framework of the study, Significance of the Study, and Definitions used in this study.

Chapter Two reviews the relevant literature on HBCUs and faculty salary studies.

CHAPTER TWO

Review of the Literature

This chapter reviews literature on the history of HBCUs and faculty salary studies. The purpose of this chapter is to identify the variables included in the faculty salary analysis. Included in this review are sections on HBCU's histories, curricula, institutional climate, faculty, funding issues, and fund raising, as well as demand and supply of African American faculty. The review also includes sections on endowment assets, public vs. private higher education institutions, faculty pay theories, human capital theory, faculty salary studies, faculty salary, satisfaction with work and faculty turnover, and wage decomposition. The aim of all of this is to understand the factors that affect faculty salaries at HBCUs and non-HBCUs.

History of HBCUs

The Higher Education Act of 1965, as amended, defines an HBCU as: "...any historically black college or university that was founded prior to 1964, whose principal mission was and is, the education of black Americans" (NCES, 2004, p. 104). There are 103 public or private, and 4-year or 2-year HBCUs. These institutions are located in 20 states, the District of Columbia, and the Virgin Islands. The complete list of all the HBCUs is included as Appendix I. Under the 1994 Carnegie classifications, only one HBCU was classified as a Research I university and a small number were labeled Research II institutions. Only a few HBCUs offer master's degree programs and have

significant numbers of faculty members who are actively engaged in research. Most are four-year institutions. The student population is above 9,000 in few institutions, while the majority have enrollments of 5,000 and below (Bonner, 2001). Thus, from the outset, it is clear that differences in institutional variables can affect faculty salaries.

Prior to the Civil War, the combination of slavery and segregation restricted educational access and opportunity for African Americans. African American students were denied entry to institutions of higher learning except for a few institutions like Amherst College and Oberlin College. Wilson (1988) wrote,

The historically Black colleges and universities have a history unique to American higher education. That history is a consequence of the presence of slavery in the American colonies, beginning with the importation of the first blacks in 1619. Slavery precluded blacks from participating in the general institutional life of the colonies even after the Declaration of Independence in 1776 declared that slaves would be counted as “three-fifths of a man” in those states where slavery was permitted. Although the first college for blacks (now called Cheyney [State] University) was established in Pennsylvania in 1837, the major history of historically black universities and colleges did not begin until after the Civil War. (p. 121)

During the period of slavery through Jim Crow, African Americans were almost categorically excluded from postsecondary education. Much of the early legislation in the south affecting black education was influenced by the Black Codes (Brown & Davis, 2001). Bond (1934) stated,

The “Black Codes” of 1865-1868 in South Carolina, Georgia, Mississippi, and other states were reflected in similar enactments of county and municipal bodies. These acts, preliminary to final adjustment, were invalidated by the passage of the thirteenth, fourteenth, and fifteenth amendments, but their transient popularity at this time helps us to understand the prevailing opinion of the men who dictated the course of the newly reconstituted political bodies. (p.16)

The first Morrill Act of 1862 provided federal support for state education, particularly in agriculture, education, and military sciences. These provisions were to be made without respect to racial categorization. At least seven black colleges were in operation at this time: Cheyney State University (PA), Harris-Stowe State College (MO), LeMoyne-Owen College (TN), Lincoln University (PA), University of the District of Columbia (DC), Wilberforce University (OH), and Winston-Salem State University (NC). Between 1865 and 1875, 24 private black colleges opened, funded by church groups, the Freedman’s Bureau, and blacks themselves. Although a few states established public institutions for blacks, the major impetus for black public education came in 1890, with the passage of the second Morrill Act.

The missionary groups took the first major step toward a system of schools and colleges for blacks. Following the American Missionary Association’s (AMA) lead in 1861, many religious benevolent societies sent missionaries into the south to uplift the freed slaves through religion, education, and programs of physical assistance. The AMA founded seven black colleges and 13 normal schools between 1861 and 1870 (Browning & Williams, 1978). Despite their different origins, the three key goals of all HBCUs

were (a) education of black youth, (b) training of teachers, and (c) continuation of the missionary tradition by educated blacks (Allen & Jewell, 2002).

In 1863, the Emancipation Proclamation was enacted granting freedom to the slaves in confederate states. In January 1865, Congress passed the thirteenth amendment prohibiting slavery in the United States. In March 1865, Congress approved the Freedmen's Bureau to aid white refugees and former slaves. The Freedmen's Bureau provided financial support for the maintenance and establishment of a substantial number of black "day schools, night schools, industrial schools, institutes and colleges" (Bennett, 1984, p. 218).

Twelve years after the Confederacy's surrender, northern industrialists and an accommodating president, Rutherford Hayes, gave control of the south to its planters and white supremacists. The withdrawal of federal troops from the south led to a period of general repressiveness in southern society. The intent of most white southerners in the post-Reconstruction era was to dismantle whatever formal structures black equality had assumed in recent years. Further it was the policy to limit the growth of black education and channel it into vocational training. This policy reflected the judgment that blacks deserved and could benefit from an industrial rather than a classical or liberal education. African Americans could only aspire for an industrial education in the south (Browning & Williams, 1978).

Most white southerners were eager to limit blacks to just elementary education. Wolters (1975) had documented the strong southern sentiment that higher learning would lead African Americans to increased dissatisfaction with their inferior status, and would cause them to be less submissive, less deferential, and unwilling to labor in the fields. At

the same time there was a new quasi-scientific movement called Social Darwinism. It declared that African Americans were a genetically inferior race. Accepting the theory made it simpler to rationalize repression of black college education. There was little sense in supporting higher learning for a race which was “by birth and natural capacity fitted only for manual labor” (McPherson, 1975, p. 339). Further public formal education would greatly minimize the usefulness of African Americans as workers in a caste-like workplace environment (Ogbu, 1978).

Most of the benefits of the early land grant movement reached only the white population of the 17 segregationist states. Only Mississippi, Virginia, and South Carolina shared their endowment with colleges educating black citizens. Throughout the 1870s and 1880s, Congress debated whether institutions receiving federal land grant aid should be required to admit African American students, or whether states denying admission to African Americans should be required to provide for their separate education. The Morrill Act of 1890 mandated that federal funds be extended to institutions that enrolled African Americans. The southern states were then forced to establish new land-grant institutions for blacks, or take over existing public or private black institutions as land grant colleges (Brown & Davis, 2001; Kujovich, 1994).

Shortly after the Civil War there were roughly four million African Americans in the United States: about 400,000 were free; only about 28 had had a college education. Wright (1960) and other historians estimated that as many as 96% of the four million were illiterate. Pifer (1973) wrote in his historical review of black higher education:

Understandably, the development of higher education for blacks during Reconstruction and its aftermath was conditioned by....military, political, and social developments....Indeed the history of higher education for blacks in the latter part of the 19th century is mainly a chapter in southern history (p.11).

The missionaries have to be viewed as the educational philanthropists of that time and predecessors to the great philanthropic foundations which left their impact on black higher education toward the end of the century. The missionaries faced a daunting task to educate the freed slaves. Wright (1960) observed that there were no elementary or secondary schools to prepare students for college. Prior to 1860, of all the southern states, only Kentucky and North Carolina had a semblance of a public school system.

Several northern denominational groups established colleges for the blacks. The inspiration for the missionaries was the success of the two northern missionary colleges established for blacks before the end of the war – Lincoln University of Pennsylvania by the Presbyterian Church in 1854 and Wilberforce of Ohio in 1856 by the Methodist Episcopal denomination. Most of the so-called “colleges” pioneered for southern blacks were little more than secondary schools (Peeps, 1981). Pifer (1973) reported that half a dozen or more institutions for blacks had genuine collegiate departments as early as 1872 and by 1895 they graduated more than 1,100 students who pursued careers in teaching, the ministry, and other service professions. Browning and Williams (1978) explained:

Education in the liberal arts was, for the missionaries, a means of remaking blacks into the image of the ideal American citizen....What distinguishes missionaries’ work from other social reforms of the period and from that which followed was a

belief, at least stated, that blacks were equal to whites but for the debilitating efforts of slavery. (p.91)

The Freedman's enthusiasm for learning encouraged the creation of the first black institutions of higher education in the southern and border states. As increasing numbers of African Americans enrolled in the elementary schools, the demand for additional teachers increased. As early as 1866, the Freedmen's Bureau general superintendent for education forecasted a need for 20,000 teachers and advocated the establishment of normal schools to train black teachers (Kujovich, 1994). By 1900 the national census recorded 21,268 black teachers, 15,530 black clergymen, and 1,734 black physicians and surgeons. Three quarters of a century later, however, there were 41,409 engineering degrees awarded: only 756 were received by blacks. There should have been at least six times that number, to equal the 1974 population ratio. Of the 300,000 physicians in the United States, fewer than 2% were black, despite Howard and Meharry graduating black physicians for more than a hundred years. In 1974, there were 3,362 doctorates awarded in engineering, and only 12 went to blacks (Branson, 1978, p.150). This indicates that the numbers of African Americans completing degree programs in higher education had not increased to the expected levels.

The effectiveness of HBCUs was limited by the realities of segregation. Despite the "separate but equal" ruling by the US Supreme Court in the 1896 Plessy v. Ferguson case, black public education was underfunded at the state and local levels. In the 1930s, lawsuits were filed in the southern states challenging the "separate but equal" concept in higher education to break the "glass ceiling" imposed on African American education for the past 70 to 75 years. In 1954 the Supreme Court reversed its decision in Plessy v.

Ferguson with *Brown v. Board of Education of Topeka, Kansas*. After another decade of southern resistance to integration, African Americans could gain entry into previously segregated colleges and universities (Jewell, 1999). In 1950, majority of African Americans in college attended HBCUs, but by 1975 about 75% of African Americans in college were enrolled in predominantly white institutions (Allen & Jewell, 2002). Subsequently, HBCUs had to compete with other higher education institutions for African Americans to meet their enrollment goals. The next section looks at the curriculum at HBCUs which explains the reasons for the low number of science graduates from HBCUs .

Curriculum at HBCUs

White missionaries started and controlled Howard University, Fisk University, Atlanta University, Hampton Institute, Straight College (later Dillard), Bennett College, Clark College, Morehouse College, Spelman College, and Shaw University. A majority of the missionary institutions followed the traditional liberal arts curriculum found in elite white colleges. However, some schools broke from the liberal arts tradition and focused on industrial education. Hampton Normal and Agricultural Institute, the pioneer in industrial schools, focused on a program of manual training since the institution's white missionary founder believed blacks were morally inferior and incapable of effectively utilizing liberal arts training. Bullock, as well as Spivey (as cited in Allen & Jewell, 2002) acknowledged that this curriculum developed basic academic competence, stressed manual laboring skills, and encouraged political accommodation through strict compliance with the south's racial codes.

The public educational system for African Americans was described as inadequate by federal investigators some fifty years after the end of the Civil War. HBCUs had the responsibility for educating African Americans in the south, particularly at the secondary and post-secondary levels. HBCUs were also forced to operate as multilevel institutions, with students at the secondary, college preparatory, and college levels. These burdens had a negative impact on the development of HBCUs as full-fledged higher education institutions. Federal and state agencies did not recognize the vast majority of these institutions as college-grade institutions because of their large secondary departments, and denied accreditation for these institutions. As secondary departments were phased out, black educational institutions began to be accepted in the college community on a limited basis. Graduate education at HBCUs was almost non-existent. This explains why a majority of HBCUs are Carnegie baccalaureate or masters institutions, and there are very few HBCU doctoral institutions (Allen & Jewell, 2002).

The history of the industrial versus classical curriculum in black higher education dates from the 1880s to the First World War. The conflict is often viewed as an ideological struggle between two African American leaders, Booker T. Washington and W. E. B. Du Bois, who took opposing views on the level of education appropriate for the new black citizen. Booker T. Washington, a graduate of Hampton Institute (now Hampton University) was a strong advocate of vocational and technical training for African Americans. He later founded the Tuskegee Institute (now Tuskegee University) in Alabama on the Hampton model. The Hampton/Tuskegee model of education was endorsed by white northern philanthropists and southern politicians as a compromise between maintaining white supremacy and satisfying black educational aspirations in the

south. The 1890 amendment to the 1862 Land Grant Colleges Act, and the popularity of the Hampton/Tuskegee model, spurred the growth of state-supported technical and industrial colleges for blacks in the region (e.g., Alabama A&M, Tennessee A&I, and North Carolina A&T universities) (Anderson, 1988).

Industrial education was perceived by some blacks and many progressive whites as a new weapon to keep the black caste-bound. The technical education soon degenerated to a symbolic brand of inferior training. White supremacists seized on the industrial college model as a design to maintain blacks at the lowest rungs of the economic ladder (Browning & Williams, 1978). What was elsewhere regarded as skilled education for America's modernizing economy became at many of the south's best-supported black colleges a pre-industrial curriculum of simple crafts, gardening, and other similar skills (Pifer, 1973). On the other hand, W.E.B. Du Bois was a strong opponent of industrial education. Du Bois was educated at Fisk University, a black institution and then at predominantly white Harvard. Du Bois argued that black equality meant developing black leadership (his Talented Tenth) to the same level of intellectual, social, and political education as whites. As Browning and Williams (1978) said, "For Du Bois, industrial education required blacks to give up political power, abandon their insistence on civil rights, and withdraw demands for the education of black youth" (p. 77).

Bullock (as cited in Allen & Jewell, 2002) reported that the debate between Washington and Du Bois divided the African-American intellectual community and HBCUs themselves into two separate camps. Washington's influence forced many liberal arts institutions to adopt the Hampton/Tuskegee model to maintain financial

support from northern philanthropists and southern state governments. The Washington/Du Bois controversy was an attempt by African Americans to retain a voice in deciding their educational (and by extension, social, political, and economic) destiny. However, its outcome was largely decided by those with power and resources. The decisions to fund industrial rather than liberal arts institutions for African Americans and to adopt industrial course at traditionally liberal arts schools were largely out of the hands of African Americans. These decisions were made by white-controlled state governments, white individual and corporate philanthropists, and white-dominated agencies like the General Education Board, the Phelps-Stokes Fund, and the Julius Rosenwald Fund.

There were several options for those who had the power to influence the education of African Americans. On the one hand there was the Washington industrial education model and on the other the Du Bois liberal learning model. At this time, a new model of northern philanthropy in the form of richly endowed educational foundations supported by great northern industrialists George Peabody, John D. Rockefeller, and Andrew Carnegie became popular. Their influence was to be more financial and less ideological than that of their missionary predecessors. However, even in the late 1800s it was clear that the allocation pattern of philanthropic dollars represented an endorsement of one educational philosophy over another (Peeps, 1981). Carnoy (1974) mentioned:

The position taken toward white supremacy by these northern capitalists, who may have been genuinely concerned about the social and economic constraints placed on blacks by southern whites, was completely consistent with their views on white racial and ethnic superiority as practiced in the north. (p. 292)

The agents of philanthropic foundations went first to Booker T. Washington for advice. Therefore, it was not surprising that black institutions following the Hampton/Tuskegee model received more financial support than the black institutions that promoted liberal education. At the same time, even the best of the Du Bois-style liberal arts colleges received very little financial support from the philanthropists. Consequently, the endowment wealth of institutions with industrial curriculum grew more than that of institutions with a liberal arts program (Peeps, 1981). By 1915 Hampton's and Tuskegee's respective endowments of \$2.7 and \$1.9 million were the largest of all black colleges representing over half the entire endowment of America's black private institutions. In contrast Lincoln University, then the oldest historically black liberal arts college, had an endowment of just \$0.7 million. In 1925, Hampton's endowment had soared to \$8.5 million. That placed Hampton first among black schools and seventeenth among only 176 American colleges then having endowments of more than seven million dollars (Peeps, 1981). The problem of white philanthropy and missionary control remained an issue for black colleges well into the 1920s.

During the 1920s the alumni and students of Howard, Fisk, Hampton, and Tuskegee became more vocal and insisted on greater black representation among faculties and administrators of these schools and lobbied for curriculum changes and rules governing student life. African American students began protests on campus and in the surrounding community to make their voices heard. At many institutions, courses dealing with African and African American history and culture were added to the curriculum. Atlanta University and Howard University began the publication of

academic journals and brought the study of African Americans and other people of color into the academic mainstream (Jewell, 2002).

Throughout the first half of the twentieth century, the curriculum of the black land grant colleges lacked the scientific focus that developed very early at the white schools. Graduate instruction of any type did not begin at the black schools until the challenge to the separate but equal doctrine in the 1940s, and even then seldom involved programs in the physical sciences. Lack of funding for research, affected the quality of the faculty and of the type of education offered to students (Kujovich, 1994). Hence, there are very few science graduates from HBCUs. However this situation is improving now because of the National Science Foundation grants to HBCUs to increase graduates in the STEM (Science, Technology, Engineering and Math) areas. The next section looks at the institutional climate for faculty at HBCUs and faculty's historic inability to influence decisions at the institutions.

Institutional Climate at HBCUs

Issues with financial stability, academic quality, and accreditation process of HBCUs have been reported negatively by the media (Gasman, 2007). These problems strain the relationship between faculty and administrators, forcing the administrators to impose their will on the faculty. A disproportionate number of HBCUs are on the Association of American University Professor's (AAUP) list of censured administrations. In 2004 and 2005, the AAUP censured the administrations of Meharry Medical College, Philander Smith College, and Virginia State University and condemned that of Benedict College. Investigators found administrations that disregarded principles of shared governance (Gasman, Baez, Dresner, Sedgwick, Tudico, & Schmid, 2007). However,

Minor (2005) reported that shared governance does exist at HBCUs. HBCU faculty had significant authority over academic matters such as undergraduate curriculum and tenure and promotion policies, but limited influence over nonacademic matters such as athletics, budgeting, and selection of the president. Higher education scholars have reached conflicting conclusions regarding the pros and cons of presidential power over university governance.

Guy-Sheftall (2006) found hierarchical structures at HBCUs that do not encourage faculty governance. HBCU proponents claim that strong presidential leadership is partly responsible for the survival and progress of some campuses (Minor, 2005). According to Anderson (as cited in Gasman et al., 2007) the primary purpose of HBCUs when they were established was to help the newly freed slaves gain employment, while the purpose of traditionally white institutions was to disseminate knowledge for its own sake. Thompson (as cited in Gasman et al., 2007) pointed out that faculty members at HBCUs have focused more on racial uplift than professional concerns. It appears, HBCU faculty may not have realized the importance of their role in institutional governance. Without a strong faculty senate on campus, faculty cannot present their case of low salaries, or the need for specific academic programs to college and university administrators. Another factor affecting shared governance at HBCUs concerns the racial diversity of faculty at these institutions. Faculty at HBCUs are not as unified as faculty at predominantly white institutions, where faculty are from similar racial, ethnic, and socioeconomic groups. The homogeneity allows for easier communication and effective participation in group settings. At HBCUs, faculty members from different ethnic groups

may not come together to present their needs to the Board of Trustees (Gasman et al., 2007).

The limited financial resources of HBCUs restrict class size, availability of specific majors or programs, and the nature of faculty appointments. It is difficult to attain senior faculty appointments, funds for endowed chairs, or even full-time faculty positions. Part-time faculty teach even core courses or introductory courses in many disciplines. Faculty are not included even in decision making in such matters at the department level. Substituting too many part-time faculty may lower the quality of academic programs. Senior HBCU faculty may be accustomed to tenure and promotion criteria that do not emphasize scholarly research. In contrast, many junior faculty may plan to focus on scholarship along with research and service. Senior faculty may prefer that junior faculty focus on university service instead of building a strong publishing record. Senior faculty may resist new tenure and promotion guidelines specifically for full professor more strongly than administrators. This may lead to fewer faculty in the Professor rank and a higher faculty turnover at HBCUs (Guy-Sheftall, 2006). This section reviewed the institutional climate at HBCUs. The next section looks at the faculty population at HBCUs.

Faculty at HBCUs

Faculty, when they start an academic career, face three challenges – tenure, promotion, and recognition. Faculty are evaluated on their ability to teach, conduct research, publish, and perform other duties to enhance the relationship between the institution and the community. The challenges are more difficult for foreign-born faculty. The faculty population at HBCUs is diverse. About one-third of the professors

at HBCUs come from developing areas, mainly Africa and India. Betsey (2007), using the NSOPF 1999 dataset reported that Black non-Hispanic faculty were 61% of full-time instructional faculty at HBCUs and 3.8% of non-HBCU faculty. Women were about 35.5% of HBCU faculty and 36.2% of non-HBCU faculty. The average age of faculty at HBCUs and non-HBCUs was 51 and 49 respectively. In 1999, HBCU faculty were about 47% more likely to hold a doctoral degree than non-HBCU faculty members (58.7% vs. 40%). It is not clear if the lower percentage of non-HBCU faculty with doctoral degree is because non-HBCUs have a wider array of professional programs such as Law, and medicine where faculty credential is a M. D., and J. D. and not a Ph. D. A significantly higher proportion of foreign born faculty worked in HBCUs than in non-HBCUs.

Though highly qualified, many say foreign born faculty are overworked, underpaid, underappreciated and face discrimination from African-American professors, students and staff. As more developing nations embrace democratic governance and implement free-market policies, migration to the United States could slow. Further, the US higher education industry competes with Canada, Australia, and the European Union nations for international scholars. HBCUs in particular could be hit hard, as talented foreign scholars choose to remain in their native lands or pursue better opportunities in other countries. Smaller schools could close down or face a major recruiting crises of qualified instructors (Ngwainmbi, 2006). This is especially important since HBCUs are beginning to focus more on mathematics and hard sciences. The availability of federal grants to increase minorities' participation in the sciences and mathematics has prompted the hiring of more faculty in these areas. Increasingly, those faculty are Asian males.

The increasing numbers of foreign faculty, who are usually underpaid, can also depress the average faculty salary at HBCUs (Thurgood Marshall, 2006).

There is criticism that black colleges have been aggressive in granting tenure to faculty members resulting in many older, higher-paid professors and small numbers of junior faculty whose salaries are much lower. In 2004, a survey by the Journal of Blacks in Higher Education foundation found that the tenure rate was above the national average of 42.9% at seven HBCUs and below the national average at six HBCUs. Several HBCUs refused to provide data on tenure rates. These institutions could have declined information on tenure rates for fear of criticism from alumni, trustees, and state legislators. Therefore there is no clear data on tenure rates at HBCUs. It is possible that tenured faculty have higher salaries than faculty who are not tenured (Are the black colleges, 2004).

Prior to the 1970s, new African American doctorate recipients had limited choices except to pursue careers at HBCUs. Since the last 30 years, however, African American faculty have been working at traditionally white and historically black institutions. As the demand for African American faculty members is higher than the supply of African American faculty, HBCUs have to compete with non-HBCUs for these scholars. African Americans constitute roughly 13% of the national population and 11% of the postsecondary student population, but only 5% of full-time faculty. The reasons for the shortage are many. Not enough black students are entering higher education and the percentage of those who persist to the doctorate is small (Fields, 2000). This section reviewed some of the characteristics of HBCU faculty which may influence their salaries.

The next section looks at the demand and supply of African American faculty to explain their shortage in the academic market.

Demand and Supply of African American Faculty

In 1980, African Americans were 4.3% of all full-time faculty at all American colleges and universities. The Department of Education statistics for the year 2000 reported that there were 29,222 blacks teaching full-time at all American higher education institutions. That was 5.1% of all faculty. At many of the leading institutions, the percentage of African American faculty was 3% or below (Are the black colleges, 2004). Some scholars believe that the problem of underrepresentation of African American faculty in predominantly white institutions can be solved by implementing programs to attract bright minority students to an academic career (Cole & Barber, 2003). However, Cole & Arias (2004) insisted that the problem is not on the demand side but on the supply side. Very few African Americans earn Ph.D. degrees and it is difficult recruiting more African American faculty in arts and sciences. First, fewer African Americans graduate from college and they are less likely to graduate with a GPA of 2.8 or higher. In any given year, among African Americans between the ages of 25 and 29, approximately 11,000 new African-Americans meet the two criteria. All professions and businesses compete for this small pool of candidates. The authors further found that about 11% or 1,170 African Americans, preferred to work in an academic institution. About 40% of African American Ph.D.s in arts and sciences end up working in academia. In 1998, 567 African Americans earned their Ph.D. in arts and sciences, so in any given year there are only 227 African-Americans with a new Ph. D. in arts and sciences to meet the demand of the many academic departments in 3,700 institutions of higher education

in this country. Further, data from the Survey of Earned Doctorates (NOPRC, 2006) also confirmed the limited supply of African Americans in the academic market. This may result in HBCUs hiring faculty with different race/ethnicity at lower salaries. This section reviewed the demand and supply of African American faculty in the academic market. The next section looks at the funding issues at HBCUs.

Funding Issues at HBCUs

The history of the black public college reveals the nation's inadequate efforts to elevate its black population from a condition of slavery and enforced illiteracy to one of equality. Public higher education for black students was racially separate and never equal. In the early 1900s, the massive outlays of federal and state funds that made publicly subsidized, good quality higher education available to the white citizens of the south and of the nation were either denied to the black public colleges or inadequate for a separate and equal education. This isolation encouraged the faculties, administrators, and students of black public colleges to build on their own a system of higher education from scratch. From its beginnings in the 1870s to the Supreme Court's decision in *Brown v. Board of Education*, black public higher education had to contend with unequal resources and racial isolation (Kujovich, 1994).

In the 1900s, the shortage of resources for equipment, buildings, and other capital improvements was acute. In some schools, students constructed buildings, and in most black land grant colleges, students took care of maintenance and janitorial duties. The widespread neglect of the black land grant colleges made these institutions incapable of offering any significant higher education to their students. Kujovich (1994) reported on the importance of black higher education to the segregationist states by comparing two

revenue resources. In 1928, in 14 states the amount of state funding for resident instruction in the black colleges was approximately equal to the revenue from athletic activities at the white land grant colleges. This disparity in funding for HBCUs still exists.

In 1967, the Southern Regional Education Board reported inadequate financial resources as the critical problem faced by public black colleges. The most critical needs of the colleges at that time were: (1) basic operating income which was stable, recurring, and sufficient to permit dramatically increased faculty salaries, and (2) supplementary funds to support the upgrading of curriculum and instruction, a full battery of remedial and compensatory programs, and the expansion of administrative services. Private HBCUs also continued to operate on a meager budget and had severe financial problems (Brown & Hendrickson, 1997; The financial squeeze, 1995). Many of these problems continued into the twenty first century. The Southern Association of Colleges and Schools (SACS), in their December 2002 report, cited the termination of the accreditation of Morris Brown College and Mary Holmes College due to financial resources. In the same report, SACS revealed that several other HBCUs were placed on probation due to problems with financial resources. The institutions referred in the report included Grambling State University, Grambling, LA; Bennett College, Greensboro, NC; and Talladega College, Talladega, AL. Florida A&M University and Texas Southern University were also recently placed on accreditation probation by SACS for financial instability (Walker, 2008).

Between 1996 and 2005, 25% of SACS's sanctions pertained to black colleges, while these institutions make up only 13% of the SACS institutional membership. Since

1989, nearly half of the 20 institutions that lost their accreditation from SACS are HBCUs (Bollag, 2006). Most reprimands and revocations of accreditation are due to financial deficits; however, faculty quality (degrees), campus infrastructure, student enrollments, and even library holdings play a role in the certification process. Further, an institution that has lost accreditation cannot distribute financial aid, which can lead to declining enrollments. The institutions cannot recover financially which can affect their chance of reaccreditation. Moreover, unaccredited black colleges cannot be members of United Negro College Fund and will lose access to additional sources of funding needed for their operating budgets (Gasman, Baez, Drezner, Sedgwick, Tudico, and Schmid, 2007). If institutions lose their accreditation, they cannot attract qualified faculty or bright students that may affect their enrollment goals. This in turn can lead to more financial problems and lower faculty salaries.

HBCUs enroll a large population of students who come from educationally disadvantaged, low-income backgrounds and are first-generation college attendees. Many of these students cannot afford tuition and therefore get government assistance. Several grant programs from the federal government are aimed at developing and strengthening postsecondary institutions that serve this student population. These grants, Title III and Title IV, allocate millions of dollars every year to HBCUs to provide financial assistance to their students and for development of programs, faculty and staff. These subsidies are critical for the maintenance of private HBCUs that depend on tuition and the government grants (Mercer, 1998). Any reduction in these subsidies can lower funds available to pay faculty salaries.

If HBCUs are to increase their competitiveness to attract and retain faculty and students, they must confront some of their institutional problems. Dr. Michael Lomax, president of Dillard University said, “We can’t just idealize our environments” (Fields, 2000, p. 41). Dr. Joyce Payne, director of the Office for the Advancement of Public Colleges of the National Association of State Universities and Land-Grant Colleges, added that HBCUs must be vigilant in the pressure they apply on elected officials and government agencies to see that the funding-related inequities HBCUs are dealing with are eliminated. Dr. Payne added, “We must address some of the structural impediments to our success” (Fields, 2000, p. 41). But these problems seem to still persist.

Walker (2008) reported that a study by Minor found that large schools received more funding from the state and federal resources. The amount a school received per student was lower at HBCUs compared to non-HBCUs. Sav (2000) used the Blinder-Oaxaca decomposition method to study the fiscal discrimination leading to unequal funding of public HBCUs. He concluded that 83% of the funding differential is due to the difference in institutional characteristics, including lower undergraduate and graduate credit hour production at public HBCUs compared to public predominantly white institutions. The remaining 17% of the funding differential was due to the differential treatment of public HBCUs compared to public predominantly white institutions. The study implied that an overall redistribution of state funding would be necessary to move public HBCUs and public predominantly white institutions toward funding equality. It is possible that in the present study, a high proportion of the faculty salary differences may be explained by the differences in characteristics of faculty at HBCUs and non-HBCUs. However, the stability of higher education institutions depends on the successful

fundraising efforts at HBCUs and non-HBCUs. This section reviewed the funding issues at HBCUs. The next section looks at the challenges of fundraising at HBCUs.

Fund Raising at HBCUs

Alumni are the primary source of financial support for private colleges and a major one for all schools. The Council for Aid to Education reported that in 1999, approximately 32% of alumni at private liberal arts schools gave to their alma mater, compared to about 19% at public colleges and universities (Yates, 2001). The alumni giving rate for almost all HBCUs is significantly lower than alumni giving rate at predominantly white institutions. The national giving rate of white alumni ranges from 10% to 60% while the rate for black alumni ranges from 1% to 10% (Schexnider, 2003). In 1998, between 31% and 64% of the alumni of leading Ivy League colleges gave money to their alma maters. While at HBCUs, the alumni giving rate at Spelman College was 15% and at Howard University, 11% (The solid alumni, 2000), despite these institutions' solid reputation and recognized academic quality.

Prior to a 1996 fund-raising campaign, Spelman graduates gave \$5 or \$10 (Nicklin, 1996). After looking at Wellesley College's model and increasing the fund-raising staff from 10 to 24 people, by January 1996, 42 graduates had pledged individual contributions of more than \$10,000 (Spelman College Raises, 1996). Based on these experiences, HBCUs and their supportive organizations are becoming more savvy and aggressive about fund raising and development. A growing number of HBCUs are adopting advancement models in fund raising. HBCUs are exploring new avenues including non-alumni donor development, online contributions, alumni giving, endowment development, challenge grants, faculty and staff giving, estate planned-

giving, major gifts, and foundation and corporate gifts (Fields, 2001). In 2008 UNCF announced that it will provide \$5.9 million in grants to help six HBCUs improve their fundraising operations. Many HBCUs have inadequate fundraising staff and these grants will help increase their staff and be current on fund-raising strategies (Supiano, 2008).

Presidents of almost all HBCUs have made increased fundraising a top priority. A survey by the JBHE foundation found that only a select few of all the HBCUs use the internet as a fundraising tool. More than 85 black colleges and universities are not taking advantage of this modern powerful fundraising tool which has been successful for many educational institutions (HBCUs are slow, 2003). Hampton University has a successful fundraising model and the president has recommended other HBCUs to consider their model in their fundraising efforts (Harvey, 2008). HBCUs are beginning to share successful strategies to help other institutions raise donations.

Some of the differential giving rates between HBCUs and non-HBCUs stems from their diverse histories. Public black colleges and universities are still dealing with decades of underfunding from the pre-desegregation days. Alumni of predominantly white institutions are more likely to hold powerful positions in the state legislatures than alumni of HBCUs. Therefore, non-HBCUs have a greater advantage than HBCUs when seeking appropriations from state legislatures. Similarly, non-HBCUs have a larger pool of alumni with higher ability to give private support compared to alumni of HBCUs. Therefore, the smaller pool of HBCU alumni have to give larger donations to their alma maters to catch up with non-HBCU alumni giving (Schexnider, 2003). However, this is not the case.

The lower level of giving among HBCU graduates as compared to graduates of predominantly white institutions stems from the following realities:

(1) White family wealth in the United States is on average 10 times the wealth of the average black family, so white college graduates have a greater capacity to give.

(2) Many black colleges are either public universities or receive public funds which reduces the incentive of their graduates to donate to these schools.

(3) There is almost no tradition of higher education philanthropy among black households. Many white families have sent generations of students to various colleges, while few black families have established that tradition.

(4) A predominantly white university like University of Rochester earns millions of dollars a year in royalties from medical research. This inspires Rochester alumni to give to their university. Black universities like Howard University do not have stunning research success to inspire similar alumni giving.

(5) Success on the football field or basketball court by a university's team often produces a jump in alumni donations. Black colleges operate on the sidelines of big college sports. Athletic teams from HBCUs do not appear on national television, do not compete in bowl games, and do not play in front of home crowds of 80,000 fans. Consequently, they do not generate the same levels of passionate support from loyal fans who reward the university with donations after a big athletic win (The solid alumni, 2000).

Among the few places that African Americans have traditionally been philanthropically generous is the church. Regardless of their current status, many African-Americans have given generously to the church (Yates, 2001). Alumni who reported a higher level of involvement with the church were more inclined to give to

HBCUs. Alumni who have the same religious affiliation as their alma mater were more likely to participate in giving (McKinney, 1978; McNulty, 1976; Oglesby, 1991, Hunter, Jones & Boger, 1999). Carson (1989) revealed that African-American alumni were more likely to give if asked by the clergy. The black church holds the loyalty of large numbers of African-Americans and exerts considerable influence over their behavior (Billingsley & Caldwell, 1991). However as noted earlier, the average black household income is proportionally lower than in white households, and black families have a limited amount of discretionary income for charitable giving. Similarly, given the loyalty of black churchgoers to their congregations, charitable dollars are unlikely to be redirected from church to educational institutions. HBCUs have to aggressively pursue different fundraising strategies to increase their endowment wealth. This section reviewed fundraising issues at HBCUs. The next section discusses the importance of endowment assets at higher education institutions.

Endowment assets

Unlike corporations that are organized to realize a profit and finance their activities with borrowed capital, either debt or equity, private colleges and universities maintain large financial reserves called endowments (Kaufman, & Woglom, 2005). In the 2003 National Association of College and University Business Officers (NACUBO) Endowment study (Cambridge Associates Inc., 2000-2004), 717 public and private participating institutions reported total endowment wealth of more than \$230 billion. The 39 most affluent institutions controlled 57.8% of the total reported endowment wealth, or more than \$133 billion. The wealthiest institutions tend to be large, but the disparities in size do not explain the disparity in endowment wealth. Among the 29 most affluent

private institutions, endowment wealth per full-time student was almost \$331,000, compared to the average of \$35,000 per student among all participants. At the wealthiest 10% of private colleges and universities, endowment per student is about \$450,000. But for all private colleges, the median endowment per student is only \$15,000. Institutions with higher endowments can add the interest income to their operating budget and disperse better salaries to their faculty (Farrell, 2008).

The exact purpose of endowments has not been explained by either academics or practitioners. Institutions may accumulate endowments as a financial buffer, a way to preserve traditions, or as a way to insulate the university from outside demands. Hansmann (1990) argued that endowments may reflect the perspectives of trustees. Trustees with a business background may find it difficult to measure the output and achievement of higher education institutions, and therefore may be tempted to measure the success of an institution in terms of the dollar value of the endowment. Therefore, a college trustee may perceive his or her job to be first and foremost as increasing the value of the endowment.

Colleges can use their endowment wealth in many ways. They can increase spending on instruction which usually includes faculty salaries, academic support, research, student services, and institutional support. Wealthier institutions could maintain spending but increase educational subsidies in two ways. They can reduce the comprehensive fee they charge to full-paying students, or offer more generous financial aid packages. Institutions can also use their wealth to construct new buildings or purchase new land, equipment, and collections. Otherwise, wealthier institutions can decide not to spend their endowment income and let their financial wealth accumulate.

This would eventually increase the differences in wealth between themselves and less affluent institutions. HBCUs do not have large endowments and may not be able to offer generous student financial aid packages. Institutions giving generous financial aid to students may get some of that money back from tuition that can be used to pay faculty salaries (Kaufman & Woglom, 2005b).

Large endowments are relatively rare within higher education. In 2005, approximately 25 schools had endowments above \$2 billion, 30 had endowments between \$1 and \$2 billion, and 50 had endowments between \$0.5 and \$1 billion. The large majority of schools have endowments below \$100 million. So within HBCUs or non-HBCUs, endowment per student may not explain a large portion of the variance in faculty salaries (Cheslock, 2006). Therefore, other explanations must be explored.

Most HBCUs have small endowments. At least 10 HBCUs have a total endowment of less than \$1 million and another 19 HBCUs have total endowments less than \$5 million. The combined endowments of all HBCUs is \$1.7 billion. Howard, Spelman, Hampton, and Morehouse together account for nearly half of this total (Endowment Wealth, 2004). Howard's endowment at \$317 million is the largest of any HBCU, followed by Spelman at \$219 million, Hampton at \$100 million, and Morehouse at \$95 million. As many HBCUs depend on the endowment yield to fund current operations, the endowment funds of HBCUs are usually invested in low risk securities that have low yields (In a Rising Stock Market, 2004). Endowment is not an absolute measure of a college's economic success and it must be considered along with other criteria, including the institution's debt load, financial management and enrollment. The financial variables are reviewed in a later section.

HBCUs have been forced to increase tuition to make ends meet. Most HBCUs struggle to balance their operating budgets and have little resources left for financial aid and other student scholarships (Endowment Wealth, 2004). Nearly 80% of students attending HBCUs require some form of financial aid. Inadequate finances result in many African American students dropping out of college, and small endowments restrict the amount of financial aid HBCUs can offer their students. Further, institutions with small endowments may not be able to pay competitive faculty salaries (Nealy, 2008).

The increasing disparity in faculty salaries across institutions is due to the growing dispersion of endowment wealth. Even if two institutions experience the same percent increase in endowment per student during a period of time, the institution with the highest initial level of endowment per student will have an advantage over the institution with the lower initial level of endowment per student. Hence the richer institution can increase its average faculty salary level by a greater percentage during that period. On the other hand, HBCUs have meager endowments with lower rates of return and may have a tough time increasing faculty salaries (Ehrenberg, 2003). In this study, endowment per student will be used as one of the independent variables to predict faculty salary. It appears this may be a more powerful predictor than the Instruction expenses, Research expenses, or Total expenses variables available in the NSOPF. All the variables cannot be used at the same time since they can be highly correlated and could lead to multicollinearity in regression analysis. This section reviewed the status of endowment assets at higher education institutions. The next section exposes the disparity in wealth between public and private higher institutions.

Public vs. Private Higher Education Institutions

The former Cambridge historian David Cannadine stated that “the capacity of Oxford and Cambridge to compete on equal terms with Harvard or Yale or Princeton dwindles and diminishes by the day” (Targett, 1999, p. 25). This statement reflects how the current academic market for high quality faculty is affecting Oxford and Cambridge. In today’s global economies, the recruitment of high quality academic scholars is not limited to state, region, or national borders. Many American faculty are now willing to work in UK, Canada, Australia, and the Middle East if they are not satisfied with conditions at their present institutions. Many public university leaders in the United States complain that the high faculty salaries at private universities are leading to an academic brain drain from public universities (Alexander, 2001). Recently, low faculty salaries or unfavorable tenure and promotion policies have resulted in 25 professors from American universities including Harvard, University of California at Los Angeles, and University of Wisconsin at Madison to move to the University of British Columbia, Canada (Gravois, Mangan, & McCormack, 2008). This migration of faculty from reputed institutions can result in faculty from smaller liberal arts institutions moving to public universities since there is a disparity in income, which translates to faculty salaries, between these types of institutions. This can lead to a scarcity of quality faculty at HBCUs and other smaller institutions.

Since 1980 average faculty salary disparities at all ranks between comparable public and private universities expanded substantially. In 1979-1980, full professors at private Research I universities earned \$1,300 (1998 dollars) more than full professors at public Research I universities. However, in 1997-1998, this gap soared to \$21,700.

Similar disparities existed in salaries of faculty at private and public Research II and Doctoral I and Doctoral II universities. The long-term impact of these differences over a twenty-year career cycle is significant. For example, if the average faculty salary disparity between public and private Research I full professors were to remain constant based on 1998 disparities over a twenty period, a full professor at a private research university would receive \$434,000 more in lifetime earnings than a full professor at a public research university. If the salary difference was compounded annually at 8% interest rate over a twenty-year career, a private research university faculty member would earn \$1,072,452 more than his or her public university counterpart (Alexander, 2001). After reading this, it is easy to explain the consequences of the disparity in wealth between HBCUs and other institutions. The next section details the realities and implications of various faculty pay theories.

Theoretical Constructs regarding Faculty Pay

Hansen (as cited in Fairweather, 1995) grouped theories of faculty pay into three categories – (1) factors outside the influence of higher education, (2) market competition, and (3) institutional forces. Factors outside the control of academe include changes in political decisions, like the state funding formulae, which can affect faculty salaries. The market competitiveness attributes macro-level changes in faculty salaries to supply and demand. Institutional forces view salaries as a means for administrators to reinforce behavioral norms. The third category seems relevant at HBCUs. It was explained in the Institutional Climate at HBCUs section, that administrators at HBCUs use salaries to reinforce behavioral norms. On the other hand, Twigg, Valentine, and Elias (2002) categorize pay as either a function of market competition or institutional forces.

According to the theory of compensating differentials proposed by Rosen (as cited in Zoghi, 2003), faculty may trade off certain services for some part of their salary. A faculty member sells personal labor and buys job characteristics, such as small class size, prestige, summer vacations, and or good students. At the same time, the institution buys the skills and labor from the faculty member and sells the job characteristics. A match is made when a faculty member finds the salary paid and the job characteristics acceptable and the university finds the skills and labor of that faculty member acceptable. The salary offered by the institution to the faculty member equals the pay deserved by the faculty for the skills less the amount the job characteristics are worth. Clark & Knapp (as cited in Zoghi, 2003) found that the local quality of life was fairly important in determining cross-sectional differences in faculty salaries across schools. Majority of HBCUs are at rural locations, and faculty who prefer such surroundings may be willing to give up higher salaries for the local quality of life.

Agency theory, which is related to institutional forces, also provides a theoretical framework for faculty salaries (Tosi & Gomez-Mejia, 1989). An agency relationship is in effect when one party, a principal, hires another party, an agent, who has certain special skills and knowledge (Jensen & Meckling, 1976). Agency theory advocates assume that each party acts in its own self-interest. This assumption leads to what is known as agency problem where the interests of the principal and agent may be inconsistent. In a university, administrators and faculty have to deal with the agency problem. Except for student contact time in the classroom, which rarely exceeds 12 hours a week, faculty members at most institutions do not have any constraints on their time. This freedom presents a major challenge for the administrators who want to

prevent faculty members, their agents, from taking advantage of their privileges. Some faculty members may put minimal effort into teaching and research and spend more time on self-serving activities, like consulting or leisure that are not in the best interests of the university. University administrators cannot control faculty behavior, and therefore they link faculty salaries to such behavioral outcomes as research productivity, to align the interests of faculty with those of the university (Gomez-Mejia & Balkin, 1992).

Market models attribute changes in faculty salaries to supply and demand (Bowen & Sosa, 1989). The national market perspective is that research and scholarly prestige are highly valued in the national faculty labor market (Winston, 1994). All institutions want to hire faculty with research potential or faculty who already have many publications. Therefore salary will depend on research productivity. The market segmentation perspective is that teaching-oriented institutions pay their most productive teachers more than they pay faculty with research credentials, and research universities pay faculty with research credentials more than excellent teachers (Fairweather, 2005). Frank & Cook (1995) attributed the growing inequality of faculty salaries to the “winner-take-all” phenomenon where individuals with outstanding characteristics reap a disproportionate share of the rewards. While superstar researchers have always been valued in higher education, technological advancements like computers, email, have reduced the need for all star researchers to work at the same institution. Even lower ranked institutions can easily lure faculty from top ranked institutions with high salaries (Monks, 2003). Even if a star faculty does not actually move, the offer itself is enough for the faculty’s current institution to make a counter-offer (Lazear, 1986). This section

reviewed the theoretical constructs regarding faculty pay. The next section discusses the human capital theory model which is the basis for most salary studies.

Human Capital Theory

Human capital is defined in economic terms as whatever characteristics an individual possesses that produces earned income (Darity, 1982). Human capital theory views income as a function of market factors. Individuals who invest in human capital can expect greater returns on their investment in the form of higher earnings. Investment in education and job training increase one's value to an employer because the elements of human capital yield higher productivity (Parcel & Mueller, 1983). Human capital investment decisions are made by each individual within a society. People may migrate, quit their current employment for a higher paying job, or even choose a low-paying job with a high learning potential. People make current investment decisions that will increase their expected future returns (Langelett, 2002).

The Mincer human capital equation is the wage equation used in most empirical studies of the labor market. Mincer (1974) developed a function where the logarithm of earnings is a linear function of years of schooling (S) and a quadratic function of a variable j defined as:

$$(1) \quad j = A - S - 5$$

where A is age.

Based on a set of assumptions, Mincer derived the following estimating equation:

$$(2) \quad \text{Log } Y_t = a_0 + a_1 S + a_2 j + a_3 j^2 + u$$

Where Y_t is earnings at age t, j is defined by (1), and u is the error term. This equation has been subsequently modified to include other variables.

Blinder (1973) explained that the independent variables can vary based on the individual researcher's model. Most of the earlier salary studies included independent variables that correlated with salary, in ordinary least squares regression. In his study Blinder used the following structural model:

$$\log w = f(\text{Ed}, \text{Occ}, \text{J}, \text{M}, \text{V}, \text{T}, \text{Z}) + u_1$$

$$\text{Ed} = g(\text{Occ}, \text{V}, \text{B}, \text{Z}) + u_2$$

$$\text{Occ} = h(\text{Ed}, \text{J}, \text{V}, \text{B}, \text{Z}) + u_3$$

$$\text{J} = k(\text{Occ}, \text{V}, \text{M}, \text{B}, \text{Z}) + u_4$$

$$\text{M} = l(\text{Ed}, \text{Occ}, \text{V}, \text{B}, \text{Z}) + u_5$$

$$\text{V} = m(\text{Ed}, \text{Occ}, \text{J}, \text{B}, \text{Z}) + u_6$$

$$\text{T} = n(\text{Ed}, \text{Occ}, \text{J}, \text{M}, \text{V}, \text{Z}) + u_7$$

Where w is the hourly wage; Ed is a vector of educational dummy variables; Occ is a set of occupation dummy variables; M is a dummy variable for union membership; V is a dummy variable for veteran; T is a set of dummy variables for tenure on the present job; B is a set of family-background variables; Z is a set of other exogenous variables; and f , g , h , k , l , m , and n are all linear functions. In this model, w , Ed , Occ , J , M , V , and T are taken to be endogenous, while B and Z are exogenous. The elements of Z , which enter the wage equation with nonzero coefficients, are age, health, residence, and local labor market conditions. The salary equation used in faculty salaries and the present study is based on this model because all variables highly relevant to the academic job market. In this study, the faculty salary model can be expressed as a function of Education, Employment, Demographics, Productivity, and Institution variables:

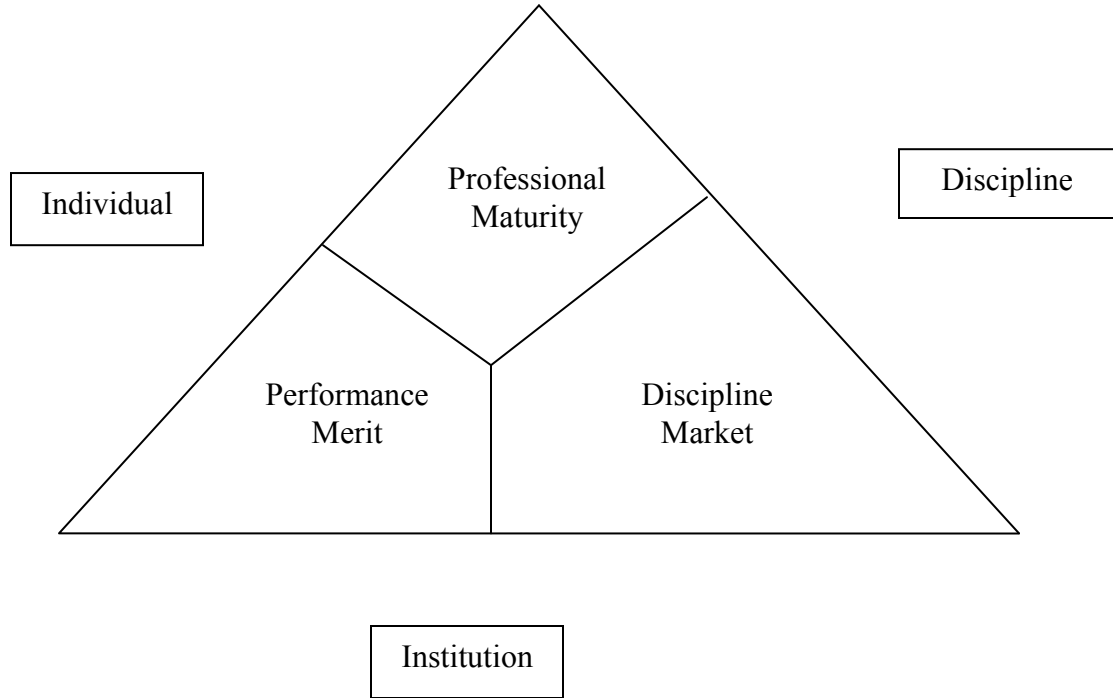
$$\log(\text{salary}) = F(\text{Education}, \text{Employment}, \text{Demographics}, \text{Productivity}, \text{Institution}).$$

Scholars have used educational attainment, experience, research productivity, teaching outputs, and rank as measures of human capital (Perna, 2003; Toutkoushian, 2002, 2003). According to some researchers, since the human capital theory focuses only on individual characteristics, this theory does not explain the effect of social structures and labor markets (Perna, 2003; Rosenbaum, 1986). Structural theory examines the influence of the characteristics of the colleges and universities where faculty were trained and work, financial resources, student enrollment, tenure process, and collective bargaining agreements (Perna, 2001). Youn (1992) noted the academic labor market is segmented by academic discipline, job task (principal activity - teaching, research, administration), and job status (full-time or part-time). Faculty salaries also vary by institutional type (two year or four year), and institutional control (public or private). This section explained the human capital theory. The next section details some of the early faculty salary studies and the predictor variables included in the models.

Faculty Salary Studies

The first step in most salary analyses is to develop a conceptual model of what variables or measures should explain faculty salaries. McLaughlin, Frost and Schultz (1995) proposed the model shown in Figure 2.

Figure 2
Factors Affecting Salary



Source: McLaughlin, Frost and Schultz (1995)

The three primary entities in the model are the individual, the institution, and the discipline. The individual has a set of personal characteristics, abilities, motivations, and experiences. The institution has a purpose and a set of resources to pursue that purpose. The discipline has standards for professional competence and a paradigm for examining the faculty role and level of competence. The entities interact with three primary attributes: merit, professional maturity, and market. Merit reflects the quality and quantity of work of the faculty. Professional maturity includes years of service to the institution and profession. Market is the supply of faculty and the demand for their services (McLaughlin, & Howard, 2003). It is possible that faculty at HBCUs are at a disadvantage in the institution entity, and market attribute given the Carnegie

classification of the vast majority of HBCUs, and their focus on teaching rather than research, as well as the supply and demand of African American faculty. The model used in the present study is in Figure 1. It includes education, employment, demographics, productivity, and institution variables.

Numerous faculty salary studies have been published in the professional literature which may be used as models for researchers as they select the predictor variables for new studies. Some of these studies are mentioned here to portray the various choices available to a researcher. Cohn (1973) used data on faculty salaries from AAUP reports of 204 institutions. The independent variables in this study were type of institution (university vs. other types); control (private independent and church-related vs. public); region (northeast vs. other regions); quality variables (including the number of National Merit scholars in 1968, percent of students pursuing graduate or professional studies following graduation, student/faculty ratio, AAUP classification, and the percent of full professors in the faculty); dynamic changes (percent change in student/faculty ratio from 1967-68 to 1970-71); size of the institution (enrollment in 1970-71); and the 1969 per capita income in the state where the school was located. His conclusions were:

- 1) Private and church-related schools paid lower salaries than public schools,
- 2) Quality of an institution measured by variables such as National Merit Scholars, percent of graduates pursuing additional studies following graduation, and student/faculty ratio was very important.
- 3) An inverted U-shaped specification characterized salary-size relationship.

Enrollments beyond 30,000 did not increase salary.

4) Per capita income in the state where an institution was located appeared to be directly related to salaries and compensation.

Many HBCUs are private, church related institutions and are located in the southeast and southwest where the per capita income in the states is low. All these factors contribute to lower faculty salaries at HBCUs.

Abundant literature exists on the difference in average earnings of men and women in academe (Bayer, 1973; Bayer & Astin, 1975; Bellas, 1993; Barbezat, 1987; Ashraf, 1996; and Megdal & Ransom, 1985). The average salary of female faculty is lower than the average salary of male faculty in all these studies, but the percentage difference varies in each study. Bayer (1973) estimated a 12% difference, Bayer and Astin (1975) found a 4% difference, and Bellas (1993) calculated a 25% difference in gender salary. Barbezat (1987) found that from 1968 to 1977, the total salary differential between male and female academics dropped from about 23% to 19%. The proportion of the observed salary differential due to discrimination declined appreciably during this period probably due to the positive effect of affirmative action policies, litigation, and the internal pressure from female faculty for salary studies within their institutions. Ashraf (1996), using the Oaxaca decomposition procedure, found a 28% difference in the 1969 salaries with the discrimination component measuring 14%. The discrimination component dropped to 8% in the 1984 salaries but rose to 15% in the 1989 salaries. Megdal & Ransom (1985) speculated that because the immediate pressure of anti-discrimination legislation had subsided, any progress toward salary equity may have eroded. Renzulli, Grant, and Kathuria (2006) reported a smaller gender gap in faculty

salary at HBCUs compared to faculty salary at predominantly white institutions. As will be noted in Chapter Five, the present study affirms this conclusion.

Another form of discrimination depresses women's wages: the devaluation of work performed predominantly by women. There is a negative relationship between the proportion of women in jobs and the average salaries in those jobs (Michael, Hartmann, & O'Farrell, 1989; Bellas, 1993; Umbach, 2006; Umbach, 2008). The negative relationship indicates that both women and men are punished for doing work that is usually done by women and are paid less than if the work were typically done by men. This phenomenon is termed comparable worth (Bellas, 1994). As in the non-academic labor force, there is considerable sex segregation within academia – across, and in many instances within, disciplines (Jacobs, 1985). Academic fields employing high proportions of women pay less than those where women employees are scarce (Staub, 1987). Academic disciplines in which there is a high percentage of women, such as English, foreign languages, and psychology, pay less than disciplines in which women are scarce – for example, engineering, computer science, and economics (Hamermesh, 1993). Since HBCUs are traditionally liberal arts institutions and few have engineering or computer science departments, even male faculty in the English or foreign language departments are likely to earn lower salaries.

Relatively few studies at the institutional or the national level focus on academic salary differentials by race or ethnicity. African American faculty members constitute a much higher proportion of faculty at HBCUs than non-HBCUs. It is well known that the average faculty salary at HBCUs is lower than the average faculty salary at non-HBCUs. However no study has explained the factors for the faculty salary gap between HBCUs

and non-HBCUs. This study will use the Blinder-Oaxaca model to analyze the salary gap.

Ashraf and Shabbir (2006), using the NSOPF:93 data, found that white faculty at the Associate Professor and Full Professor level earned more than African American faculty at the same rank. However, at the Assistant Professor level, African American faculty earned more than white faculty. The authors argued that increased pressures for diversification of the racial composition of faculty may have led to the hiring of junior African American faculty at a premium considering the large demand for and the limited supply of African American academics. As will be noted in Chapter Five, the present study also found that African American faculty earned more than white faculty at non-HBCUs.

Race also plays a role in faculty salary levels as evident in the academic disciplines where non-whites are predominantly employed. Asians are more likely to be in engineering, math, computer science or natural science; black faculty in education, and Hispanics in modern languages (Callie, 2006). Using the NSOPF 1993 data set, Monks & Robinson (2000) found that citizenship status also affects faculty salary, with naturalized citizens and noncitizens receiving significantly lower salaries compared to U.S. citizens. An explanation for this could be that there is a correlation between race and citizenship, because 89% of all Asian males are either naturalized or noncitizens compared to only 6% to 10% of whites. It is possible that Asian faculty who are not US citizens may earn lower salaries compared to white and African American faculty who are US citizens.

Studies find that unionized faculty earn slightly higher salaries than non-unionized faculty. Barbezat (1989) reported a 2% union premium, whereas Ashraf (1992) estimated a 4% overall union effect that varied substantially by faculty sub-group. Monks (2000) calculated a 7% to 14% premium for unionized faculty. Barbezat (1989) and Ashraf (1992) used data from the 1977 Survey of the American Professoriate, while Monks (2000) used the NSOPF 1993 data set. This explains the different percentages in different studies.

Salary compression refers to small salary differential between faculty with different levels of experience. Salary compression occurs when the demand for faculty members changes in external labor markets and institutions adjust their offers to attract new, junior faculty and fail to compensate the salaries of existing senior faculty. Prior studies have concluded that age and experience have a nonlinear effect on income (Perna, 2001; Barbezat & Hughes, 2005; Toutkoushian & Conley, 2005; Toutkoushian, Bellas, & Moore, 2007). The squared term for each of these variables captured these nonlinearities in all of these studies. Salary compression is a form of discrimination since institutions pay junior and senior faculty differently for the same characteristics (Toutkoushian, 1998). Some institutions award market adjustments to compensate for salary compression in certain fields. Departments monitor market trends to attract and retain qualified faculty. A common proxy for market is college or department. College is an imprecise proxy because a college may be a collection of departments, while department is a closer approximation of disciplinary markets (Moore, 1993) because departments are usually discipline specific. Faculty salaries vary across disciplines. Therefore, department or academic discipline should be included as one of the factors to determine

faculty salaries (Hoffman, 1976). In this study academic disciplines are grouped into ten different categories including Agriculture & home economics, Business, Education, Engineering, Fine arts, Health Sciences, Humanities, Social Sciences, Natural Sciences, and other programs to minimize the number of variables in the regression.

One possible explanation of salary compression is that individuals with long seniority are simply less productive. The best professors can find jobs anywhere, but the less able have to stay where they are (Ransom, 1993). According to Harris and Holmstrom (1982), a worker with unknown ability is initially offered a guaranteed lifetime salary. In due course of time, all the firms are aware of the worker's productivity. If a worker is very productive, the salary will be increased to match outside offers. But if the worker has a low productivity, no outside offer can be higher than the initial guaranteed salary. Workers who receive outside offers are more likely to change firms, so high-seniority workers tend to have low productivity and low salaries. This reinforces the market competition model explained in the theoretical constructs regarding faculty pay section.

“Publish or perish!” has long been an accepted imperative for faculty at major universities. In recent years, the norm of “publish or perish” has gained currency in other quarters of the academic world, including the smaller liberal arts colleges. This has caused the rise of the “university college”, a high-quality undergraduate school serving as a prep school for graduate school. Such institutions sought to build faculties of not just “instructors,” but “scholars”. Many small colleges have come to rely more on research productivity in decisions about which faculty to hire and fire, which to promote, and about how much faculty should be paid (Michalak & Friedrich, 1981). Majority of

HBCUs are small teaching oriented institutions. However HBCUs also may use research productivity measures to compensate faculty.

Using the National Study of Postsecondary Faculty 1993 data, Fairweather (2002) compared the percentage of faculty productive in teaching or/and research across research, doctoral, comprehensive, and liberal arts institutions. Publishing productivity ranged from about six refereed publications during the previous two years for faculty at research institutions to less than two at liberal arts institutions during the same time period. Faculty at liberal arts colleges produced the least number of total student contact hours in Fall 1992 semester, signifying smaller class sizes, while faculty at other four-year institutions produced significantly larger number of contact hours. There were very few cases of the complete faculty member with high levels of productivity in teaching and research. For most faculty, high number of student contact hours diminished publication rates, and vice versa. Untenured faculty were the least likely to attain high levels of both research and teaching productivity during a given two-year period. It is possible that HBCUs may have many untenured faculty with low research output.

Teaching is a common function in institutions with different missions – liberal arts colleges teaching undergraduates, comprehensive colleges offering masters-level professional education, doctoral-granting schools training PhDs, and research universities investing in knowledge generation. The difference between the missions of research and doctoral-granting universities, on the one hand, and comprehensive institutions and liberal arts institutions, on the other, is the emphasis on research at the former and teaching at the latter. Faculty at HBCUs may have less publications compared to faculty

at non-HBCUs (Fairweather, 1995) given their differential mission and primary focus on undergraduate teaching.

Tuckman and Tuckman (1976) were the first to integrate productivity factors into a salary estimation model. Institutional researchers use variables available on institutional databases. If institutions award salaries and pay raises based on merit and productivity, these variables should be part of the institutional database. Moore (1993) reported on the fact that these variables are still not available in institutional databases undermines the credibility of the institutions in this area. This study had to get faculty productivity data from the NSOPF 2004 data set where individual faculty members report the details to NCES.

Sociologists have argued that faculty seek prestige through research and publishing to meet internal academic standards, and institutions seeking to enhance prestige will mimic those with the highest status (Fulton & Trow, 1974). Over time there is a blurring of missions across types of institutions with faculty and administrators imitating the behavior of those institutions with higher prestige (Fairweather, 1995). Melguizo & Strober (2007) acknowledged that faculty are rewarded financially for enhancing the prestige of their institutions. Even liberal arts colleges rewarded faculty publications. Time spent on teaching was not rewarded in any type of institution.

Many academic departments seek faculty skilled in teaching, research, public service, and administration. Faculty with such credentials benefit their department with increased student enrollments, outside grant funding, and recognition by the university, local community, and discipline at large. The stock of each faculty skill available in the marketplace is relatively fixed in the short run. If the demand for a skill increases, the

price paid to faculty for this skill increases, creating salary differentials among faculty. In the long run, the number of faculty with the desired skill also increases, and narrows the differential among skills. Therefore, higher faculty salaries benefit the institutions with increased enrollment, external funding, and the overall quality of faculty in the academic market (Tuckman, Gapinski, & Hagemann, 1977).

One of the predictors of the quality of faculty may be the quality of the institution where they earned their doctoral degree (Johnson & Stafford, 1975). Further faculty from Carnegie classification of Research I institutions may command a higher value. Moore (1993) categorized the faculty degree earning institutions into Research I, Research II, and other degree granting institutions. This study used the same categories for the faculty's highest degree earned from institution to account for the quality of faculty. Faculty who graduated from Research I universities may earn higher salaries than faculty who graduated from Research II institutions.

This section looked at some of the variables used in faculty salary studies in the past to select the predictor variables for this study. All the variables in this study have been used in earlier studies and are good predictors of faculty salary. The next section looks at some of the financial variables.

Financial variables

Large endowments are relatively rare within higher education. In 2005, approximately twenty-five schools had endowments above \$2 billion, thirty had endowments between \$1 and \$2 billion, and fifty had endowments between \$0.5 and \$1 billion. The large majority of schools have endowments below \$100 million (Cheslock, 2006). Most HBCUs have small endowments. At least 10 HBCUs have a total

endowment of less than \$1 million and another 19 HBCUs have total endowments less than \$5 million. The combined endowments of all HBCUs is \$1.7 billion. At the wealthiest 10% of private colleges and universities, endowment per student is about \$450,000. But for all private colleges, the median endowment per student is only \$15,000 (Farrell, 2008). It appears endowment per student may not explain a big portion of the variance of faculty salary within HBCUs or non-HBCUs.

The major component of assets at most institutions is the endowment. It also includes the value of life funds and the book value of the physical plant, equipment, and collections. The major liability at most institutions is the value of the outstanding debt from bond issues (Kaufman & Woglom, 2005). Schultz (2000) found a considerable increase in the long-term debt of colleges and universities even as their tuition and endowments grew. Johnstone (1993) argued that many institutions with endowments that exceed \$1 billion choose to borrow rather than use their assets because the interest payments are lower than the returns on their investments; thus it is cheaper to borrow than use their assets for expenses. Institutions with smaller endowments are forced to borrow to compete with their better-funded competitors. Blumenstyk (2008) reported that Quinnipiac University, an institution with about 7,400 students and operating budget of \$236 million derived mainly from tuition and fees, quadrupled its debt load in 2007 to \$488 million, the maximum it could borrow without damaging its credit rating. In this study, debt ratio is calculated as the ratio of total liabilities to total assets. Perhaps institutions with a high debt ratio may pay their faculty lower salaries as they lack the fiscal flexibility.

Nearly 80% of students attending HBCUs require some form of financial aid. Inadequate finances result in many African American students dropping out of college, and small endowments restrict the amount of financial aid HBCUs can offer their students (Nealy, 2008). During 2000-2001, 73% of all undergraduate students enrolled in public 4-year HBCUs received some type of financial aid. 18% of the students received institutional grants, and the average institutional grant was \$3,118. In the same period, 87% of students enrolled in private not-for-profit HBCUs received some type of financial aid, 37% of the students received institutional grants, and the average institutional grant was \$4,458. In all public 4-year degree –granting institutions, 71% of the undergraduate students received some type of financial aid, 37% of the students received institutional grants, and the average institutional grant was \$2,068. In all private not-for-profit 4-year degree granting institutions, 83% of students received some type of financial aid, 32% of the students received institutional grants, and the average institutional grant was \$3,001 (NCES, 2004). There is not a significant difference in the percentage of students receiving any form of financial aid in HBCUs and non-HBCUs. Hence, this variable may not explain a big portion of the difference in HBCU and non-HBCU faculty salary.

Twenty five years ago, at American private undergraduate colleges, Lugt (1983) found a strong positive correlation between faculty salaries and tuition. The correlation increased with rank and was highest for full professors. Among private liberal arts colleges, 52% of the variation in faculty salaries was explained by differences in student tuition and fee charges. The other variables that explained the rest of the variation were student/faculty ratio, faculty distribution by rank, endowment and gift income, student aid cost, and academic support costs. Although liberal arts colleges spend about 40% of their

general and educational budget on faculty salaries, the model predicted that only 12% of the increase in college income was spent on increasing faculty salaries. The increase had probably returned as higher amount of student aid and was not available for raises in salary. Institutions with higher revenues may increase the size of their financial aid package and not divert it to faculty salaries. There is no current evidence that Lugt's conclusions have changed. This section looked at the financial variables. The next section looks at faculty work satisfaction and turnover and if low salary is one of the reasons

Faculty Salary, Satisfaction with Work and Faculty Turnover

High salaries have been used to recruit and retain top quality academic faculty. According to most literature prior to 1990, faculty accepted academic employment for reasons other than money. Caplow and McGee (1958) were among the first to discuss the role of salaries in faculty satisfaction and academic mobility. Based on their interviews of faculties, they reported that salaries were not a major reason for faculty dissatisfaction with the university. However, academic mobility increasingly relied on salary and other differences in compensation.

Academic positions, like other jobs, have both extrinsic and intrinsic rewards. For many faculty, the intrinsic satisfaction of academic work is greater than in most other jobs. Faculty members with superior reputations can earn higher salaries without sacrificing the intrinsic advantages of jobs in good colleges or universities, while faculty with lower achievements are not widely recognized are doubly penalized by having to work in less desirable places and for lower salaries. Salaries are important for faculty

recruitment because they usually are the deciding factor between equally attractive academic positions (Blau,1974).

In a replication of Caplow and McGee's study, Burke (1988) found that the reasons given then for leaving – prestige, security, and authority- shifted in 1988 to quality of life and personal fulfillment. Weiler (1985) reported that salary was a significant factor in leaving, but two-thirds of those who leave cite personal factors like relationships with colleagues or a career change. Salary is one tangible factor, among several intangible factors that Matier (1990) cited in faculty members' decisions to leave when they have firm offers in hand.

Although some degree of turnover is inevitable and perhaps desirable, high rates of faculty turnover can be costly to the reputation of an institution and to the quality of instruction. As Johnsrud and Rosser (2002) noted, "Too often the faculty who leave are those the institution would prefer to retain" (p. 518). Other negative consequences of faculty turnover include costs for recruiting replacements, reduced integration within the academic department, disruption of course offerings, and diminished morale among those employees who remain in the organization (Mobley, 1982; Price, 1997). No current studies on HBCU faculty specifically confirm or refute these conclusions.

Public universities have begun gathering data on the migratory patterns of their faculty only recently. Higher education researchers and administrators who study the academic labor market know faculty mobility depends on many factors. It would be a mistake to underestimate the value of money in market –based economies, especially when high pay differentials exist between public and private institutions. This is relevant to the higher education environment where institutional status and prestige are evaluated

by the reputation and quality of the academic labor force (Alexander, 2001). As will be noted in Chapter Five, HBCUs do value faculty with research credentials and have incentives to attract faculty with research skills to maximize prestige of their institutions. The next section looks at the wage decomposition theory used in this study.

Wage decomposition theory

One popular technique used in salary equity studies is the multiple regression method. The methods for analyzing wage discrimination include the traditional multiple regression approach with dummy variables, such as gender and ethnicity, and the Blinder-Oaxaca method (Rhee, 1997). Until 1973 the study of wage gaps and discrimination was based on the total wage differential, and did not separate out the part of the wage differential that can be explained by factors such as education. Blinder (1973) and Oaxaca (1973) developed their widely used econometric framework for measuring the effects of wage discrimination. It assumes that if there is no discrimination, the estimated effects of worker's endowments on earnings are the same for each group. Differences in the estimated coefficients reveal discrimination (Rhee, 1997). The Blinder-Oaxaca decomposition method is used to statistically separate the wage gaps due to actual differences between two populations and differences due to employer preferences. While this model has been widely used to study gender and racial discrimination, it can also be used to look at different preferences between two groups of employers (Harris, 2003). This method has been used in studies other than salaries also. Riggs & Dwyer (1995) used this procedure to study the salary differences between black male faculty and other race-sex groups at a southern historically black public institution. Sav (2000) employed this procedure to assess the fiscal discrimination in the allocation of

state funding of public historically black and predominantly white colleges and universities. In this study, the Blinder-Oaxaca decomposition method is used to separate wage effects due to different characteristics of faculty at HBCUs and non-HBCUs, and wage effects due to different reward structures used at HBCUs and non-HBCUs, thus adding to the existing body of literature on applications of this model.

This chapter reviewed the literature on HBCU's histories, curricula, institutional climate, faculty, funding issues, fund raising, as well as demand and supply of African American Faculty. The review also included sections on endowment assets, public vs. private higher education institutions, faculty pay theories, human capital theory, faculty salary studies, financial variables, faculty salary, satisfaction with work and faculty turnover, and wage decomposition in order to identify the determinants of faculty salaries at HBCUs and explain the salary gap between faculty at HBCUs and non-HBCUs. It is apparent that there are structural differences between HBCUs and non-HBCUs. However, it is not clear to what extent each variable affects differences in faculty salary. The next section addresses the research questions for this study, the datasets used in the study, and the methodology.

CHAPTER THREE

Research Methods

Overview of Study

This study used the NSOPF: 2004 data set to evaluate the faculty salary structure at HBCUs and non-HBCUs. The difference in the average salary of faculty at non-HBCUs and the average salary of faculty at HBCUs was analyzed using the Blinder-Oaxaca wage decomposition model. This section covers the research questions, sample design, treatment & processing of data, variables in regression, dummy variables, multicollinearity, and data analysis strategies used in the study.

Research Questions

The research questions for this study are:

- 1) To what extent do characteristics of faculty at HBCUs differ from characteristics of faculty at non-HBCUs (in terms of education, employment, demographics, productivity, and institution variables)?
 - a) What are the characteristics of faculty at HBCUs?
 - b) What are the characteristics of faculty at non-HBCUs?
- 2) To what extent do the salaries of faculty at HBCUs and non-HBCUs differ with respect to the education, employment, demographics, productivity, and institution variables?
 - a) What are the determinants of faculty salary at HBCUs?
 - b) What are the determinants of faculty salary at non-HBCUs?

3) To what extent does the Blinder-Oaxaca wage decomposition model explain the salary differential between faculty at HBCUs and non-HBCUs?

Sample Design

The National Study of Postsecondary Faculty (NSOPF): 2004 employed a two-stage sampling methodology for selection of eligible faculty and instructional staff to determine their education, employment, demographics, productivity and also institutional characteristics. At the first stage, the institution frame included 3,380 Title IV participating post-secondary institutions that were two year and four year, public and private not-for-profit, and located in the 50 states and District of Columbia. At the second stage the faculty frame included all faculty and instructional staff in those institutions totaling approximately 1.1 million individuals (NCES, 2006). The NSOPF: 2004 consisted of a sample of about 34,330 faculty and instructional staff across a sample of 1,070 post-secondary institutions. Equal probability stratified systematic sampling was used to select faculty and instructional staff from the list. The faculty sample was chosen from each institution, within each faculty stratum defined by race/ethnicity, gender, and employment status with academic field serving as an implicit sort variable. A total of 26,110 faculty completed the survey with a 76% response rate (NCES, 2006).

Next analysis weights were determined for responding faculty to reflect the selection probabilities of institutions that provided faculty lists and selection of faculty members within sampling institutions. Survey weights were determined to remove any bias that might result due to differential nonresponse and undercoverage. The faculty analysis weights (WTA00) were calculated as the product of the following nine weight components and adjustment factors:

- (1) institution sampling weight
- (2) institution multiplicity adjustment factor
- (3) institution nonresponse adjustment
- (4) institution poststratification adjustment factor
- (5) faculty sampling weight
- (6) faculty multiplicity adjustment factor
- (7) faculty nonresponse adjustment factor
- (8) faculty poststratification adjustment factor.

The NSOF employed a multistage cluster sampling design. It is possible that homogeneity within the respective clusters (colleges) could lead to underestimated standard error values if the analysis was done with Statistical Package for Social Sciences (SPSS) which assumes random sampling of data. Therefore it was necessary to correct the standard error of the mean and the regression coefficients obtained from SPSS for the design effects of the NSOPF. This was important to avoid Type I error in inferences. Type I error occurs when a researcher incorrectly rejects the null hypothesis, claiming incorrectly that there is a significant group difference or a significant correlation. In this study, a regression coefficient which is not significant can be treated as significant without a correction for the design effect. The corrected standard error of the mean is calculated by multiplying the standard error from SPSS by a term called the root design effect (DEFT). The standard error of the regression coefficients are calculated similarly by multiplying the standard error of the coefficients from SPSS by the root design effect (DEFT). The DEFT values are usually provided by NCES in the methodology report of the survey (NCES, 2006). The revised t-values and the 95%

confidence intervals for the regression coefficients are calculated with the revised standard errors for the coefficients (Thomas & Heck, 2001).

Treatment & processing of data

The National Study of Postsecondary Faculty (NSOPF) data set had not been used to analyze faculty salaries at HBCUs. The NSOPF: 2004 restricted data set was used in this study. Institutions are coded by Carnegie type in the NSOPF survey. Since there was no code for HBCUs in the NSOPF survey, the HBCU identifier in Integrated Postsecondary Education Data System (IPEDS) was used to identify the HBCU institutions in the NSOPF dataset for this study. Since the NSOPF was not designed to be institution specific, the researcher also selected the HBCU institutions by setting the variable Black non-Hispanic student enrollment at 50% or higher in the NSOPF dataset. The institutions selected as HBCUs were the same in both procedures. Faculty information from the HBCU group was compared with faculty information from the non-HBCU group of institutions. The percentage of students receiving any financial aid, percentage receiving institutional grant aid, average amount of institutional grant aid received, total liabilities, total assets, and endowment assets of all the institutions in this study was merged into the NSOPF: 2004 dataset from the IPEDS dataset. The debt ratio and endowment per student were calculated as the ratio of total liabilities and total assets, and endowment assets and total enrollment.

The data analysis for the research questions were as follows:

- 1) The mean characteristics of faculty at HBCUs and at non-HBCUs were calculated.
- 2) The regression coefficients for the faculty salary structure at HBCUs and non-HBCUs were calculated.

3) The mean and regression coefficients for all the variables for the HBCU and non-HBCU institutions were used in the Blinder-Oaxaca decomposition procedure to separate out the explained and unexplained portions of the difference between the mean salary of faculty at HBCUs and the mean salary of faculty at non-HBCUs.

Variables in regression

The first task in any regression method is to select the variables to be included in the model. The dependent variable in this study was the natural log of the NSOPF salary variable - Amount of income from basic salary from institution. The natural logarithm of the salary was used as the dependent variable since the transformed variable is more normally distributed. When the natural log of the salary is used as the dependent variable, the regression coefficients are explained in percentages instead of dollar amount. The independent variables for this study were selected based on the guidelines from the literature review in Chapter II. The complete list of independent variables is in Appendix II and the multiple regression coding for the variables is in Appendix III .

In this study, years of experience was measured by

- 1) age, age squared.
- 2) the NSOPF variable - years since receiving highest degree and the quadratic term which is the square of years since receiving highest degree, and
- 3) the NSOPF variable - years since began first faculty or instructional job and the quadratic term which is the square of the years since began first faculty or instructional job.

The squared terms were added since the relationship between age or experience and salary is not linear.

Salary compression was accounted for by

- 1) the NSOPF variable - years held current job and the quadratic term which is the square of the years held current job, and
- 2) the NSOPF variable - years since rank achieved and the quadratic term which is the square of the years since rank achieved.

Since there is abundant literature on the salary difference between men and women, gender was included as one of the variables. Ethnicity categories included white, black/African American, Asian/Pacific Islander, American Indian/Alaskan native and Hispanic. Education was measured by the highest degree earned –doctorate, first professional and masters. Categories for tenure status were tenured, on tenure track, not on tenure track, and not tenured/no tenure system. Citizenship status was categorized as US citizen and not US citizen. Union status was categorized as union member and not a union member. As in most faculty salary studies, only full-time faculty in four year institutions in the ranks of Professor, Associate Professor, and Assistant Professor were included. Two year institutions were not included in this study since the mission of these institutions is different from four year institutions. Lecturers and instructors were not included since they may not have significant research contributions and may be working predominantly in community colleges or on a part-time basis.

To measure quality of faculty, the institution where the faculty earned the highest degree was identified and classified as Carnegie Research I, Carnegie Research II, and all other institutions. The productivity measures included in this study are the following NSOPF variables:

Percent time spent on undergraduate instruction, Percent time spent on graduate/first professional instruction, Percentage time spent on research activities, Scholarly activity if funded, Career articles- refereed journals, Career articles-non refereed journals, Career book reviews/chapters/creative works, Career books/textbooks/reports, Career presentations, Career exhibitions/performances, Career patents/computer software, Recent articles refereed journals, Recent articles non refereed journals, Recent book reviews/chapters/creative works, Recent books/textbooks/reports, Recent presentations, Recent exhibitions/performances, and Recent patents/computer software.

Financial variables were imported from the Integrated Postsecondary Education Data System (IPEDS). Institutional variables selected for this study were Carnegie classification, location, level of control, percentage of students receiving any financial aid, percentage of students receiving institutional grant aid, average amount of institutional grant aid, endowment per student and debt ratio. Endowment per student was calculated as the ratio of total endowments to total enrollment. Debt ratio was calculated as the ratio of total liabilities to total assets. The complete list of variables in the study is included in Appendix II.

Dummy Variables

The coding of categorical data requires the development of mutually exclusive and exhaustive categories. The same rules apply to the creation of dummy variables. A categorical variable with j categories requires a set of $j-1$ dummy variables. Using binary (0,1) coding, dummy variables are always dichotomous variables. All respondents who are members of a particular category are assigned a code of 1; respondents not in that particular category are assigned a code of 0.

The rationale for $j-1$ dummy variables for a qualitative variable of j categories follows directly from the requirements of the classical linear regression model. In particular, the presumption of no perfect collinearity among independent variables requires that none of the predictor variables can be a linear combination of the remaining predictor variables in the model. If in addition to a dummy variable (Male) coded 1 for a respondent who is male, a second dummy variable (Female) coded 1 is included for a respondent who is female, then the specified model has a linear relationship between two independent variables, because $\text{Male} = 1 - \text{Female}$. A single dummy variable is adequate for variables that have two categories. The category not named as a dummy variable serves as the reference group (Hardy, 1993). The complete dummy coding is included as Appendix III.

Multicollinearity

An issue in multiple regression is multicollinearity. Multicollinearity is a problem when there is a moderate to high intercorrelations among predictor variables in a regression analysis. Stevens (1992) explained three reasons why multicollinearity can be problematic for researchers:

- (1) Multicollinearity severely limits the size of R , the multiple correlation. Multiple correlation is the Pearson correlation between the actual and predicted values of the dependent variable. Under multicollinearity conditions, the independent variables are “going after” much of the same variability on the dependent variable.
- (2) The importance of individual independent variables are confounded due to the overlapping information.

(3) Multicollinearity tends to increase the variance of the regression coefficients, which leads to an unstable prediction equation.

Given these problems, multicollinearity should be addressed by the researcher prior to the execution of the regression analysis. The easiest method for diagnosing multicollinearity is to examine the correlation matrix for the predictor variables, looking for moderate to high intercorrelations. However, it is preferable to use one of two statistical methods to assess multicollinearity (Mertler & Vannatta, 2005). First, tolerance statistics can be obtained for each independent variable. Tolerance is a measure of collinearity among independent variables, where possible values range from 0 to 1. A value for tolerance close to zero is an indication of multicollinearity. A value of 0.1 typically serves as the cutoff point (Norusis, 1988). A second method is to examine values for the variance inflation factor for each predictor. The variance inflation factor (VIF) for a given predictor indicates whether there is a strong linear association between it and all remaining predictors. Although there is no steadfast rule of thumb, values of VIF that are greater than ten are generally cause for concern (Stevens, 1992).

Several methods are available for combating multicollinearity in regression analysis. The simplest method is to delete the problematic variable from the analysis (Sprinthall, 2000). If the information in one variable is being captured by another, deleting one of them does not affect the analysis. A second option is to combine the variables involved to create a single measure that addresses a single construct, thus deleting the repetition (Stevens, 1992). One might consider this method for variables with intercorrelations of 0.80 or higher. Predictor variables with VIF values higher than 10 were dropped from the analysis because they proved redundant.

Data analysis strategies

The Blinder-Oaxaca wage decomposition method was used to explain the salary gap between faculty at HBCUS and non-HBCUs.

For each type of institution, the equation is the standard multiple regression model:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_j X_j + \varepsilon \quad (1)$$

Using the standard multiple regression assumption of $E(\varepsilon) = 0$, the expected value of y is given by:

$$E(y) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_j X_j \quad (2)$$

In the Blinder-Oaxaca decomposition, the faculty at HBCU and non-HBCUs equation 2 is defined as:

$$(\hat{W}) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_j X_j \quad (3)$$

where (\hat{W}) is wages, β_0 is the intercept, β_j is the coefficient of the j^{th} variable, and X_j is the mean of the j^{th} variable. The means are calculated from the dataset under analysis in the normal way, so that a mean is also produced for any indicator variable.

The salary gap is represented by:

$$\begin{aligned} (\hat{W}^{\text{non-HBCU}}) - (\hat{W}^{\text{HBCU}}) &= (\beta_0^{\text{non-HBCU}} - \beta_0^{\text{HBCU}}) + (\beta_1^{\text{non-HBCU}} X_1^{\text{non-HBCU}} - \beta_1^{\text{HBCU}} X_1^{\text{HBCU}}) \\ &+ (\beta_2^{\text{non-HBCU}} X_2^{\text{non-HBCU}} - \beta_2^{\text{HBCU}} X_2^{\text{HBCU}}) \dots + \\ &(\beta_j^{\text{non-HBCU}} X_j^{\text{non-HBCU}} - \beta_j^{\text{HBCU}} X_j^{\text{HBCU}}) \end{aligned} \quad (4)$$

The model can be summarized as:

$$\begin{aligned} (\hat{W}^{\text{non-HBCU}}) - (\hat{W}^{\text{HBCU}}) &= [(X_{ij}^{\text{non-HBCU}} - X_{ij}^{\text{HBCU}}) \beta_{ij}^{\text{non-HBCU}}] + \\ &[(\beta_0^{\text{non-HBCU}} - \beta_0^{\text{HBCU}}) + (\beta_{ij}^{\text{non-HBCU}} - \beta_{ij}^{\text{HBCU}}) X_{ij}^{\text{HBCU}}] \end{aligned} \quad (5)$$

where X is a vector of measured characteristics of the workers such as highest degree earned, and experience as well as control variables like race, ethnicity, and location. The

vector of regression coefficients β , is the return that the market yields to a unit change in endowments such as education and experience. The first term is called the explained portion of the salary gap. It measures the salary gap due to differences in characteristics of faculty at HBCUs and non-HBCUs. The explained portion of the salary gap is the salary difference attributed to differences in the characteristics like job rank, gender, ethnicity, and education between faculty at non-HBCUs and HBCUs ($X_{ij}^{\text{non-HBCU}} - X_{ij}^{\text{HBCU}}$) evaluated at the rate of return on investment for faculty at non-HBCUs ($\beta_{ij}^{\text{non-HBCU}}$). The second term is called the unexplained portion. It can also be interpreted as the differences in characteristics of faculty at HBCUs and non-HBCUs that might not have been included in the model. The unexplained portion is the difference between the rates of return on investment ($\beta_{ij}^{\text{non-HBCU}} - \beta_{ij}^{\text{HBCU}}$) for faculty at non-HBCUs and HBCUs weighted by characteristics of faculty at HBCUs (X_{ij}^{HBCU}). In equation (5), faculty at HBCUs and non-HBCUs are paid according to the non-HBCU faculty salary structure. The model explains the degree of under payment of HBCU faculty with respect to non-HBCU faculty.

A large unexplained value is undesirable for two main reasons, both of which are concerned with model misspecification:

- a) A large unexplained value could mean that important variables have been omitted from the model under consideration.
- b) One or more variables in the model may not be a valid proxy. The greater the number of proxy variables used, and the more error associated with each proxy, the larger the unexplained value. A high unexplained value implies other variables that can explain

faculty salary have been ignored in the regression and the model cannot explain the salary difference.

Equation (5) can also be written as

$$(\hat{W}^{\text{non-HBCU}}) - (\hat{W}^{\text{HBCU}}) = [(X_{ij}^{\text{non-HBCU}} - X_{ij}^{\text{HBCU}}) \beta_{ij}^{\text{HBCU}}] + [(\beta_0^{\text{non-HBCU}} - \beta_0^{\text{HBCU}}) + (\beta_{ij}^{\text{non-HBCU}} - \beta_{ij}^{\text{HBCU}}) X_{ij}^{\text{non-HBCU}}] \quad (6)$$

In equation (6), faculty at HBCUs and non-HBCUs are paid according to the HBCU faculty salary structure. The model explains the degree of over payment of non-HBCU faculty with respect to HBCU faculty. Either method can be used to decompose the salary, although the explained and unexplained components will be different in both the methods. This creates an index number problem since the decomposition varies based on the reference group. In this study, decomposition was done based on both equation (5) and equation (6). Doing this provides a lower and upper bound on the contribution of each characteristic (Baras & Rodgers, 2003).

In the NSOPF: 2004 dataset, weighted faculty information at all institutions totaled 1,211,850 faculty. The data were filtered to select variables meeting the following criteria:

- 1) Institution was a four year institution
- 2) Faculty with instructional duties
- 3) Faculty had faculty status
- 4) Faculty were employed full time
- 5) Principal activity was teaching, research, or administration
- 6) Contract length was 9/10 month contract or 11/12 month
- 7) Rank was Professor, Associate Professor, or Assistant Professor

- 8) Highest degree earned was doctorate, first professional, or masters
- 9) Minimum salary was \$10,000 to eliminate outliers.

The final weighted sample size was 12,050 faculty at HBCUs, and 351,250 faculty at non-HBCUs.

This section covered the research questions, sample design, treatment and processing of data, variables in regression, dummy variables, multicollinearity, and data analysis strategies to be used in the study. The results are discussed in Chapter Four, and Summary and Conclusions in Chapter Five.

CHAPTER FOUR

Results of the study

Overview

This study examined the differences in characteristics of faculty at HBCUs and non-HBCUs, as well as the faculty salary structure at these institutions. The Blinder-Oaxaca decomposition model was then used to explain the difference in the average salary of faculty at HBCUs and non-HBCUs.

The research questions for the study are:

- 1) To what extent do characteristics of faculty at HBCUs differ from characteristics of faculty at non-HBCUs (in terms of education, employment, demographic, productivity, and institution variables)?
 - a) What are the characteristics of faculty at HBCUs?
 - b) What are the characteristics of faculty at non-HBCUs?
- 2) To what extent do the salaries of faculty at HBCUs and non-HBCUs differ with respect to the education, employment, demographic, productivity, and institution variables?
 - a) What are the determinants of faculty salary at HBCUs?
 - b) What are the determinants of faculty salary at non-HBCUs?
- 3) To what extent does the Blinder-Oaxaca wage decomposition model explain the salary differential between faculty at HBCUs and non-HBCUs?

In the NSOPF: 2004 dataset, weighted faculty information at all institutions totaled 1,211,850 faculty. The data were filtered to select variables meeting the following criteria:

- 1) Institution is a four year institution
- 2) Faculty had instructional duties
- 3) Faculty had faculty status
- 4) Faculty was employed full time
- 5) Principal activity was teaching, research, or administration
- 6) Contract length was 9/10 month or 11/12 month
- 7) Rank was Professor, Associate Professor, or Assistant Professor
- 8) Highest degree earned was doctorate, first professional or masters
- 9) The minimum salary was set at \$10,000 to remove all outliers

The final weighted sample size was 12,050 faculty at HBCUs, and 351,250 faculty at non-HBCUs (due to secrecy agreement with NCES, the number is rounded to the nearest tenth). Data on endowment, assets, liabilities, percentage of students with any financial aid, percentage of students with institutional grant aid, and average amount of institutional grant aid were merged from the Integrated Postsecondary Data System (IPEDS) based on the institution ID in NSOPF. The variable endowment per student was calculated as the ratio of endowment and total enrollment. The variable debt ratio was computed as the ratio of liabilities and assets. Data were then analyzed to answer the following questions.

Research Question 1

1) To what extent do characteristics of faculty at HBCUs differ from characteristics of faculty at non-HBCUs (in terms of education, employment, demographic, productivity, and institution variables)?

a) What are the characteristics of faculty at HBCUs?

b) What are the characteristics of faculty at non-HBCUs?

Descriptive statistics for faculty at HBCUs and at non-HBCUs were run using Statistical Package for the Social Sciences (SPSS 12). The mean and standard error of the mean for all the variables for faculty at HBCUs are in Appendix IV and for faculty at non-HBCUs in Appendix V. As mentioned in Chapter 3, the standard errors of the means were adjusted for the stratified sample design of the NSOPF survey. The average salary of faculty at HBCUs was \$62,982 and the average salary of faculty at non-HBCUs was \$73,705. The average faculty salary at HBCUs was about 17% lower than the average faculty salary at non-HBCUs. The natural logarithm of the salary, which is the dependent variable in this study, was 10.992 for HBCUs and 11.114 for non-HBCUs. The difference in the natural logarithm of the salary was 0.122. The characteristics of faculty at HBCUs and non-HBCUs are listed in Table 1 through Table 14.

Education variables

Table 1: Highest degree earned

Highest degree earned	percent HBCU	percent non-HBCU
Doctorate	85.6	84.6
First professional	2.0	5.5
Masters	12.4	9.9

About 86% of faculty at HBCUs had a doctorate degree, 2% first-professional degree, and 12% masters degree. About 85% of faculty at non-HBCUs had a doctorate degree, 5% first-professional degree, and 10% masters degree. The percentage of faculty with a doctoral degree was about the same at HBCUs and non-HBCUs. About 4% more non-HBCU faculty had a first professional degree, and 2% more HBCU faculty had only a masters degree. As faculty with a first professional degree are usually paid higher salaries than faculty with only a masters degree, the differences in highest degree earned can contribute to the salary gap.

Table 2: Highest degree earned institution

Highest degree earned institution	percent HBCU	percent non-HBCU
Research I institution	51.9	65.1
Research II institution	10.7	10.1
Other institution	29.4	17.7

About 52% of faculty at HBCUs had earned their highest degree from a Carnegie Research I institution, 11% from a Carnegie Research II institution, and 29% from other

institutions. About 65% of non-HBCU faculty earned their highest degree from a Carnegie Research I institution, 10% from a Carnegie Research II institution, and 18% from other institutions. About 13% more non-HBCU faculty earned their highest degree at a Carnegie Research I institution. Faculty who graduate from a Research I university are valued as productive scholars in the academic market and paid higher salaries. Therefore, differences in the characteristics of the institution from which faculty earned their highest degree can lead to salary discrepancies. Non-HBCU faculty earned their highest degree about 18 years back, and the average number of years since receiving the highest degree for HBCU faculty was 17 years. An additional year of work experience can raise faculty salaries and lead to salary differences.

Employment variables

Table 3: Principal activity

Principal activity	percent HBCU	percent non-HBCU
Teaching	82.7	67.9
Research	3.1	21.0
Administration	14.2	11.1

The principal activity of HBCU faculty was teaching for 83%, research for 3%, and administration for 14%. The principal activity of non-HBCU faculty was teaching for 68%, research for 21%, and administration for 11%. Teaching was the principal activity of a majority of faculty at HBCUs and non-HBCUs. About 13% more HBCU faculty were involved in teaching, and 18% more non-HBCU faculty were involved in research. In the academic world, faculty with research capabilities are valued more than

faculty with teaching credentials, and these differences can contribute to the salary gap. About 43% of non-HBCU faculty and 37% of HBCU faculty reported that the current position was their first job at a postsecondary institution. The starting salary may be higher for faculty at non-HBCUs compared to HBCUs and subsequent pay raises may be based on the starting salary leading to increasing salary gap.

Table 4: Rank status

Rank	percent HBCU	percent non-HBCU
Professor	25.5	39.2
Associate Professor	43.3	29.0
Assistant Professor	31.2	31.8

The rank distribution of HBCU faculty was Professor 26%, Associate Professor 43%, and Assistant Professor 31%. The rank distribution of non-HBCU faculty was Professor 39%, Associate Professor 29%, and Assistant Professor 32%. The percentage of Assistant Professor was about the same at HBCUs and non-HBCUs. However, about 14% more of HBCU faculty were at the Associate Professor rank and 13% less at the Professor rank. Professors usually earn more than Associate Professors and differences in academic rank can contribute to the salary gap. Seniority as measured by the number of years in current job was about 13 years for faculty at HBCUs and non-HBCUs. Total academic experience as measured by the number of years since first faculty or instructional staff job was 17 years for non-HBCU faculty and 19 years for HBCU faculty. HBCU faculty had more academic experience than non-HBCU faculty. About

18% of non-HBCU faculty and 25% of HBCU faculty were union members. It is possible that unionized faculty earn higher salaries than non unionized faculty.

Table 5: Tenure status

Tenure status	percent HBCU	percent non-HBCU
Tenured	56.0	60.8
On tenure track	33.4	27.2
Not on tenure track	7.6	9.5
Not tenured/No tenure system	3.0	2.5

About 56% of HBCU faculty were tenured, 33% were on tenure track, 8% were not on tenure track, and 3% were not tenured or had no tenure system. Approximately 61% of non-HBCU faculty were tenured, 27% were on tenure track, 9.5% were not on tenure track, and 2.5% were not tenured or had no tenure system. About 5% more non-HBCU faculty were tenured, and 6% more HBCU faculty were on tenure track. About 67% of non-HBCU faculty and 77% of HBCU faculty were on a 9/10 month contract. There are more non-HBCU faculty on a 11/12 month contract compared to HBCU faculty. The difference in contract length can also affect the salary gap.

Table 6: Teaching or research field

Teaching or research field	percent HBCU	percent non-HBCU
Agriculture & Home economics	2.3	2.3
Business	8.2	7.3
Education	6.5	7.0
Engineering	9.2	6.1
Fine arts	4.8	6.4
Health sciences	5.4	9.9
Humanities	11.8	13.9
Natural sciences	25.8	25.1
Social sciences	11.1	13.0
Other programs	14.9	9.0

The major field of instruction/research of faculty at HBCUs was Agriculture & Home economics for 2%, Business for 8%, Education for 7%, Engineering for 9%, Fine arts for 5%, Health sciences for 5%, Humanities for 12%, Natural Sciences for 26%, Social sciences for 11%, and other programs for 15%. The major field of instruction/research of non-HBCU faculty was Agriculture & Home economics for 2%, Business for 7%, Education for 7%, Engineering for 6%, Fine arts for 6%, Health sciences for 10%, Humanities for 14%, Natural Sciences for 25%, Social sciences for 13%, and other programs for 9%. About 3% more HBCU faculty were in Engineering, and about 6% more in other programs. However, about 5% more non-HBCU faculty

were in the Health sciences. Otherwise faculty discipline characteristics were about the same at HBCUs and non-HBCUs.

Demographics variables

Table 7: Gender

Gender	percent HBCU	percent non-HBCU
Male	64.5	68.3
Female	35.5	31.7

About 65% of HBCU faculty were male and 35% female. Approximately 68% of non-HBCU faculty were male and 32% female. About 3% more female faculty worked at HBCUs.

Table 8: Race/Ethnicity

Race/Ethnicity	percent HBCU	percent non-HBCU
Black/African American	60.0	3.7
White	23.2	82.4
Asian/Pacific Islander	15.3	10.1
American Indian/Alaskan	1.2	0.9
Hispanic	0.3	2.9

Approximately 60% of HBCU faculty were Black/African American, 23.2% White, 15.3% Asian/Pacific Islander, 1.2% American Indian/Alaskan native, and 0.3% Hispanic. About 4% of non-HBCU faculty were Black/African American, 82% White, 10% Asian/Pacific Islander, 0.9% American Indian/Alaskan native, and 2.9% Hispanic.

About 5% more Asian/Pacific Islander worked at HBCUs. Approximately 90% of non-HBCU faculty and 86% of HBCU faculty were US citizens. The average age in 2004 of non-HBCU faculty was 50, and HBCU faculty was 53. HBCU faculty were slightly older than non-HBCU faculty.

Productivity variables

Table 9: Percentage of time spent on instruction and research

Activity	HBCU		non-HBCU	
	Mean	Median	Mean	Median
Percent time spent on undergraduate instruction	48	50	38	35
Percent time spent on graduate/first-professional instruction	15	5	18	10
Percent time spent on research activities	19	15	26	20

HBCU faculty on average spent 48% of their time on undergraduate instruction, 15% on graduate/first-professional instruction, and 19% on research activities. Faculty at non-HBCUs on average spent 38% of their time on undergraduate instruction, 18% on graduate/first-professional instruction, and 26% on research activities. HBCU faculty spend about 10% more of their time on undergraduate instruction, about 3% less on graduate/first-professional instruction, and about 7% less on research activities. HBCU faculty spend more time on undergraduate instruction because a majority of HBCUs are baccalaureate institutions. Therefore, HBCU faculty also spend less time on graduate/first professional instruction and research activities. The median of the percentage of time spent on these activities was calculated to check if the distributions are skewed. The median and mode of the percentage of time spent on graduate/professional

instruction by HBCU faculty imply that the distribution is skewed to the right. As mentioned earlier, because there are fewer masters and doctoral HBCUs, a few qualified HBCU faculty may be spending more time on graduate/professional instruction than other HBCU faculty. It is not clear why there is a similar right skewed distribution of the percentage of time spent on graduate/professional instruction at non-HBCUs where there are adequate number of faculty to teach graduate courses. Again the percentage of time spent on research activities is skewed to the right at HBCUs and non-HBCUs indicating that some faculty are involved in research activities more than other faculty. It is possible that some faculty involved in research have a lower teaching load, and other faculty are taking the extra load.

Table 10: Scholarly activities -Career

Scholarly activities	HBCU		non-HBCU	
	Mean	Median	Mean	Median
Career articles in refereed journals	11	6	24	10
Career articles in non refereed journals	8	3	10	3
Career book reviews/chapters/ creative works	3	1	6	2
Career books/text books/reports	3	0	3	0
Career presentations	25	15	43	23
Career exhibitions/performances	8	0	10	0
Career patents/computer software	0.3	0	0.5	0

Over their career, HBCU faculty had on average 11 articles in refereed journals, eight articles in non refereed journals, three book reviews/chapters/creative works, three

books/text books/reports, 25 presentations, eight exhibitions/performances, and less than one patent/computer software. Over their career, faculty at non-HBCUs had on average 24 articles in refereed journals, 10 articles in non refereed journals, six book reviews/chapters/creative works, three books/text books/reports, 43 presentations, 10 exhibitions/performances, and less than one patent/computer software. Non-HBCU faculty had about 13 more career articles in refereed journals and 18 more career presentations. The median of the scholarly activities was calculated. It is clear from the mean and median that at HBCUs and non-HBCUs scholarly activities vary by individual faculty and faculty discipline.

Table 11: Scholarly activities of faculty: 2001 -2003

Scholarly activities	HBCU		non-HBCU	
	Mean	Median	Mean	Median
Recent articles in refereed journals	2	1	3	2
Recent articles in non refereed journals	1	0	1	0
Recent book reviews/chapters/ creative works	0.6	0	1	0
Recent books/text books/reports	0.7	0	0.5	0
Recent presentations	4	3	5	3
Recent exhibitions/performances	0.7	0	0.9	0
Recent patents/computer software	0.1	0	0.1	0

During 2001 - 2003, HBCU faculty had on average two articles in refereed journals, one article in non refereed journals, less than one book review/chapter/creative work, less than one book/text book/report, four presentations, less than one

exhibition/performance, and less than one patent/computer software. During the same time frame, faculty at non-HBCUs had on average three articles in refereed journals, one article in non refereed journals, one book review/chapter/creative work, less than one book/text book/report, five presentations, less than one exhibition/performance, and less than one patent/computer software. The scholarly activities of HBCU faculty were about the same as non-HBCU faculty. The median of the scholarly activities was also calculated, and the trend was similar at HBCUs and non-HBCUs. About 44% non-HBCU faculty and 42% of HBCU faculty had their scholarly activity funded.

Institution variables

Table 12: Carnegie classification

Carnegie classification	percent HBCU	percent non-HBCU
Doctoral institution	22.7	61.2
Masters institution	50.8	28.3
Baccalaureate institution	26.5	10.5

About 23% of HBCU faculty worked at Carnegie doctoral institutions, 50% at Carnegie masters institutions, and 27% at Carnegie bachelors institutions. About 61% of non-HBCU faculty worked at Carnegie doctoral institutions, 28% at Carnegie masters institutions, and 11% at Carnegie bachelors institutions. Higher concentrations of HBCU faculty work at masters and baccalaureate institutions because there are not many HBCU doctoral institutions. This could create a significant difference in salary because, faculty at doctoral institutions are usually paid higher than faculty at masters or baccalaureate institutions. Approximately 65% of non-HBCU faculty and 71% of HBCU faculty

worked in public institutions. It is possible that a higher percentage of part time faculty work at private HBCUs, but all part time faculty are excluded from this study.

Table 13: Regional location

Region	percent HBCU	percent non-HBCU
Mid East	50.8	16.7
Southeast	36.9	24.0
Great Lakes	6.3	18.2
Southwest	6.0	8.5
New England	0.0	7.7
Plains	0.0	8.6
Rocky Mountains	0.0	3.8
Far West	0.0	12.5

About 51% of HBCU faculty worked at institutions in the Mid East region, 37% in the Southeast region, 6% in the Great Lakes region, and 6% in the Southwest region. About 17% of non-HBCU faculty worked at institutions in the Mid East region, 24% in the Southeast region, 18% in the Great Lakes region, 8.5% in the Southwest region, 8% in the New England region, 8% in the Plains region, 4% in the Rocky Mountains region, and 12.5% in the Far West region. HBCUs are concentrated in the mideast and southeast and do not exist in the New England, plains, Rocky mountains and far west regions of the country. Salaries are usually lower in the south, and the differences in the regional location of institutions can also contribute to the salary gap.

Table 14: Finance data

Variable	HBCU	non-HBCU
Debt ratio	0.35	0.34
Endowment/student (\$)	7,174	46,259
Pct. with financial aid (%)	84	77
Avg. amount of institutional grant (\$)	3,877	6,104

HBCUs on average had a debt ratio (Liabilities/Assets) of 0.35, and endowment per student of \$7, 174. On average, 84% of students at HBCUs received some financial aid, and the average amount of institutional grant was \$3,877. The debt ratio (Liabilities/Assets) was 0.34 at non-HBCUs and 0.35 at HBCUs. The average endowment per student was \$46,259 at non-HBCUs and \$7, 174 at HBCUs. The percentage of students receiving any financial aid was 77% at non-HBCUs and 84% at HBCUs. The average amount of institutional grant was \$6,104 at non-HBCUs and \$3,877 at HBCUs. The average endowment per student at non-HBCUs was more than six times that of HBCUs. This could affect salaries and the salary gap. The impact of the differences in characteristics of faculty at HBCUs and non-HBCUs on the salary gap are explained later in this section.

Research Question 2

2) To what extent do the salaries of faculty at HBCUs and non-HBCUs differ with respect to the education, employment, demographics, productivity, and institution variables?

- a) What are the determinants of faculty salary at HBCUs?
- b) What are the determinants of faculty salary at non-HBCUs?

A regression analysis was done using SPSS 12 for faculty at HBCUs and faculty at non-HBCUs separately. The results of the regressions for HBCU faculty and non-HBCU faculty are in Appendix VI and Appendix VII.

Results of the regressions

The intercorrelation among the independent variables were explored first. The variables years since highest degree received, years since highest degree received squared, years since first faculty or instructional staff job, years since faculty job squared, years since rank achieved, years in rank squared, age, and age squared were highly correlated with correlations ranging from 0.696 to 0.962. These variables had high Variance Inflation Factor (VIF) values due to multicollinearity. All the squared terms were subsequently dropped from the regression to avoid multicollinearity.

Regression for faculty salaries at HBCUs was conducted first. Education and Employment variables (highest degree earned, highest degree earned institution type, years since receiving highest degree, first postsecondary job, principal activity, years held current job, job rank, union status, tenure status, length of contract, years since began first faculty or instructional staff job, and teaching or research field) were entered in the regression.

Demographics variables (gender, ethnicity, citizenship status, and age) were then added to the regression. Productivity variables (percent time spent on undergraduate instruction, percent time spent on graduate/first professional instruction, percent time spent on research activities, scholarly activity if funded, career articles- refereed journals, career articles-non refereed journals, career book reviews/chapters/creative works, career books/textbooks/reports, career presentations, career exhibitions/performances, career

patents/computer software, recent articles- refereed journals, recent articles-non refereed journals, recent book reviews/chapters/creative works, recent books/textbooks/reports, recent presentations, recent exhibitions/performances, and recent patents/computer software) were added in the next step. Finally the Institution variables (Carnegie classification, region where located, institution control, endowment/student, percentage of students receiving any financial aid, percentage of students receiving institutional grant, average amount of institutional grant aid, and debt ratio) were added to the regression. There was multicollinearity due to percentage of students receiving any financial aid, and percentage of students receiving institutional grant variables in the regression. The variable percentage of students receiving institutional grant aid with the higher Variance Inflation Factor (VIF) was therefore dropped from both HBCU and non-HBCU regressions. The same process was repeated for regression of faculty salaries at non-HBCU institutions. The R^2 and F statistics from the regression are given in Table 25. The addition of variables increased the R^2 and thus the ability of the variables to explain the variance in salary.

The final model with R^2 of 0.610 for HBCU indicates that all the selected variables in the study explained 61% of the variation in faculty salary at HBCUs. On a similar note, the final model with R^2 of 0.497 for non-HBCU indicates that the selected variables in the study explained 49.7% of the variation in faculty salary in non-HBCUs.

Table 15: Regression R² and F statistics

Variables	HBCU		Non-HBCU	
	R ²	F	R ²	F
Education and Employment	0.413	324.837	0.419	9736.631
Education, Employment, and Demographic	0.425	269.066	0.423	7813.732
Education, Employment, Demographic, and Productivity	0.514	246.839	0.471	6139.112
Education, Employment, Demographic, Productivity, and Institution	0.610	272.949	0.497	4696.124

Regression coefficients

As mentioned in Chapter 3, the standard errors of the regression coefficients were adjusted for the stratified sample design of the NSOPF survey. The corresponding adjusted t values have been calculated and reported in Appendix VI and Appendix VII. The unstandardized regression coefficients and the 95% confidence interval of the regression coefficients are also reported in Appendix VI and Appendix VII. Coefficients that have zero value in the confidence intervals are clearly not significant. To increase the power of the study, only regression coefficients that are significant at the p<.001 level are reported.

Education variables

Table 16: Regression coefficients - Highest degree earned and Highest degree earned from institution

Variable	Regression coefficient	
	HBCU	non-HBCU
<i>Highest degree earned</i>		
Highest degree – First professional	0.424	0.173
Highest degree – Masters	-0.083	-0.034
Highest degree – Doctorate is the reference category		
<i>Highest degree earned from institution</i>		
Highest degree institution – Research II	0.115	-0.019
Highest degree institution – Other	0.018	-0.013
Highest degree institution – Research I is the reference category		

Highest degree earned

All things being equal, at HBCUs, faculty with a first-professional degree were paid 42% more than faculty with a doctorate degree, and faculty with a masters degree were paid 8% less than faculty with a doctorate degree. On the other hand, at non-HBCUs, faculty with a first-professional degree earned 17% more than faculty with a doctorate degree, and faculty with a masters degree were paid 3% less than faculty with a doctorate degree. It is evident that faculty with a first-professional degree were more valued at HBCUs than at non-HBCUs considering only 2% of HBCU faculty hold a first-professional degree compared to 5.5% at non-HBCUs. Further faculty with only a masters degree were valued lower at HBCUs than at non-HBCUs.

Highest degree earned from institution

HBCU Faculty who earned their highest degree from a Carnegie Research II institution and faculty with degrees from other institutions were paid 12% and 2% more

than faculty who earned their highest degree from a Carnegie Research I institution. However, the difference between Carnegie Research I institution and other institutions was not statistically significant. Non-HBCU faculty who earned their highest degree from a Carnegie Research II institution and faculty who earned their highest degree from other institutions were paid 2% and 1% less than faculty who earned their highest degree from a Carnegie Research I institution. Faculty who earned their highest degree from a Carnegie Research II institution were more valued at HBCUs than at non-HBCUs. About 10% of faculty at HBCUs and non-HBCUs earned their highest degree from a Carnegie Research II institution. But there were fewer faculty who had earned their highest degree from a Carnegie Research I institution at HBCUs. This indicates that HBCUs are willing to compensate faculty who graduated from a Carnegie Research II institution to meet their demand for faculty who graduated from a Carnegie Research I institution. Although a majority of HBCUs are teaching institutions, faculty with research credentials are valued at HBCUs.

Employment variables

Table 17: Regression coefficients - First postsecondary job, Principal activity and Experience

Variable	Regression coefficients	
	HBCU	non-HBCU
<i>First postsecondary job</i>		
First postsecondary job Not first postsecondary job is the reference category	0.109	0.0022
<i>Principal activity</i>		
Principal activity – Research	0.111	0.034
Principal activity – Administration	0.064	0.059
Principal activity – Teaching is the reference category		
<i>Experience</i>		
Years since receiving highest degree	0.008	0.004
Years since began first faculty or instructional job	0.005	0.003
Years held current job	-0.002	-0.001

First postsecondary job

Faculty who started their first postsecondary job at HBCUs were paid about 11% more than faculty who had worked at other institutions prior to joining an HBCU. It may be personal reasons that compelled the mobile faculty to accept a lower paying position at HBCUs. There was no significant difference in salary between faculty who started their first postsecondary job at non-HBCUs and faculty who moved after working at other institutions.

Principal activity

Faculty at HBCUs and non-HBCUs, whose principal activity was administration were paid about 6% more than faculty whose principal activity was teaching. HBCU faculty whose principal activity was research earned 11% more than faculty whose principal activity was teaching. On the other hand, non-HBCU faculty whose principal activity was research earned only about 4% more than faculty whose principal activity was teaching. This again shows that HBCUs do value faculty with research credentials and compensate them suitably to retain them at their institutions.

Experience

At HBCUs, faculty received an increase in salary of about 0.8% for every year since they completed their highest degree, while at non-HBCUs, faculty received an increase in salary of about 0.4% for every year since they completed their highest degree. HBCU faculty received about 0.5% increase for every year since they started their first faculty or instructional job, whereas non-HBCU faculty received about 0.3% increase for every year since they started their first faculty or instructional job. Salary compression was about 0.2% at HBCUs and 0.1% at non-HBCUs for every year in the institution.

Table 18: Regression coefficients – Rank, Union status

Variable	Regression coefficients	
	HBCU	non-HBCU
<i>Rank</i>		
Professor	0.193	0.148
Assistant Professor	-0.102	-0.087
Associate Professor is the reference category		
<i>Union status</i>		
Union member	-0.058	0.013
Not an union member is the reference category		

Rank

Professors at HBCUs were paid about 19% more than Associate professors and Assistant Professors were paid about 10% less than Associate Professors. Professors at non-HBCUs were paid about 15% more than Associate professors and Assistant Professors were paid about 9% less than Associate Professors. HBCU professors received a slight premium over non-HBCU faculty. There were fewer professors at HBCUs compared to non-HBCUs, and that may be the reason they command a premium.

Union status

HBCU faculty who were union members were paid about 6% less than faculty who were not union members, whereas non-HBCU faculty who were union members were paid about 1% more than faculty who were not union members. It is not clear why unionized faculty were paid lower than non unionized faculty at HBCUs.

Table 19: Regression coefficients - Tenure status and Contract length

Variable	Regression coefficients	
	HBCU	non-HBCU
<i>Tenure status</i>		
On tenure track	0.082	-0.027
Not on tenure track	-0.109	-0.133
Not tenured/No tenure system	-0.195	-0.115
Tenured is the reference category		
<i>Contract length</i>		
11- or 12- month contract	0.087	0.078
9- or 10- month contract is the reference category		

Tenure status

HBCU faculty who were on tenure track were paid about 8% more than tenured faculty. Faculty who were not on tenure track and faculty who were not tenured/had no tenure system were paid about 11% and 20% less than tenured faculty. On the other hand, non-HBCU faculty who were on tenure track were paid about 3% less than tenured faculty. Faculty who were not on tenure track and faculty who were not tenured/had no tenure system were paid about 13% and 12% less than tenured faculty. HBCUs may be willing to pay a premium for faculty on tenure track to attract new faculty to their institutions. Faculty who were not on tenure track or not tenured and had no tenure system were not valued at HBCUs and non-HBCUs.

Contract length

At HBCUs, faculty on a 11/12 month contract earned about 9% more than faculty who were on a 9/10 month contract, whereas at non-HBCUs, faculty on a 11/12 month contract earned about 8% more than faculty who were on a 9/10 month contract.

However, about 11% more non-HBCU faculty were on 11/12 month contract compared to HBCU faculty.

Table 20: Regression coefficients - Teaching or research field

Variable	Regression coefficients	
	HBCU	non-HBCU
<i>Teaching or research field</i>		
Agriculture & Home Economics	-0.129	-0.008
Business	0.229	0.219
Education	-0.037	-0.060
Engineering	0.071	0.097
Fine arts	0.055	-0.113
Health sciences	0.024	0.061
Humanities	-0.014	-0.097
Social sciences	0.069	-0.028
Other programs	0.066	-0.039
Natural Sciences is the reference category		

Teaching or research field

HBCU faculty teaching Agriculture & Home Economics were paid about 13% less than faculty in the Natural Sciences department. However, this difference was not statistically significant. Faculty in the Business, Engineering, Social sciences, and other programs were paid about 23%, 7%, 7%, and 7% more than faculty in the Natural Sciences department. Non-HBCU faculty in the Business, Engineering, and Health sciences were paid about 22%, 10%, and 6% more than faculty in the Natural sciences department. Faculty in Education, Fine arts, Humanities, Social sciences, and other programs were paid about 6%, 11%, 10%, 3%, and 4% less than faculty in the Natural Sciences department. Faculty in Business and engineering received higher premiums than faculty in other disciplines at HBCUs and non-HBCUs.

Demographic variables

Table 21: Regression coefficients – Gender, Race/Ethnicity, Citizenship status and Age

Variable	Regression coefficients	
	HBCU	non-HBCU
<i>Gender</i>		
Female	-0.029	-0.044
Male is the reference category		
<i>Race/Ethnicity</i>		
American Indian/Alaskan native	0.037	-0.053
Asian/Pacific Islander	0.090	-0.015
Hispanic	0.027	-0.029
White	-0.048	-0.019
Black/African American is the reference category		
<i>Citizenship status</i>		
Not US citizen	-0.026	-0.007
US citizen is the reference category		
Age (in 2004)	-0.003	-0.0006

Gender

At HBCUs, female faculty received about 3% less than male faculty, whereas at non-HBCUs, female faculty were paid about 4% less than their male colleagues. Female faculty were not paid the same as male faculty at HBCUs and non-HBCUs.

Race/Ethnicity

At HBCUs, Asian/Pacific Islander faculty earned about 9% more than Black/African American faculty, and White faculty earned about 5% less than Black/African American faculty. American Indian/Alaskan native and Hispanic faculty received about 4% and 3% more than Black/African American faculty. However, the differences were not statistically significant. On the other hand, at non-HBCUs,

American Indian/Alaskan native, Hispanic, and white faculty earned about 5%, 3%, and 2% less than Black/African American faculty. Black/African American faculty were paid a premium at non-HBCUs considering they comprise less than 4% of non-HBCU faculty. Asian/Pacific Islander faculty earned about 2% less than Black/African American faculty. However, the differences were not statistically significant.

Citizenship status

Foreign born faculty were paid about 3% less than faculty who were US citizens at HBCUs and about 1% less at non-HBCUs. However, the differences were not statistically significant.

Age

At HBCUs, there was about 0.3% decrease in salary for every year faculty got older, whereas there was about 0.1% decrease in salary for every year non-HBCU faculty got older.

Productivity variables

Table 22: Regression coefficients - Teaching load and Scholarly activity

Variable	Regression coefficients	
	HBCU	non-HBCU
<i>Teaching load</i>		
Percent time spent on undergraduate instruction	-0.0020	-0.0028
Percent time spent on graduate/first-professional instruction	-0.0019	-0.0009
<i>Scholarly activity</i>		
Percent time spent on research activities	-0.0060	-0.0008
Funded scholarly activity	0.059	0.041
Scholarly activity not funded is the reference category		

Teaching load

At HBCUs, there was a 2% decrease on faculty salary for every 10% increase in the time spent on undergraduate instruction or graduate/first-professional instruction, whereas at non-HBCUs, there was a 3% decrease on salary for every 10% increase in the time spent on undergraduate instruction and 0.9% decrease on salary for every 10% increase in the time spent on graduate/first professional instruction research activities. It is clear that teaching at undergraduate or graduate level is not valued at HBCUs and non-HBCUs. The penalty for time spent on undergraduate instruction at non-HBCUs is three times the penalty for time spent on graduate instruction. Further HBCU faculty spend about 11% more of their time on undergraduate instruction. The difference in characteristics and difference in reward structure at HBCUs and non-HBCUs can have a profound effect on explaining the salary gap later on in this section.

Scholarly activity

At HBCUs, there was a 6% decrease on faculty salary for every 10% increase in the time spent on research activities, while at non-HBCUs, there was a 0.8% decrease on faculty salary for every 10% increase in the time spent on research activities. The penalty for time spent on research activities at HBCUs is more than seven times the penalty for time spent on research activities at non-HBCUs. HBCU faculty with funded scholarly activity were rewarded with a 6% increase in salary compared to faculty without any funded scholarly activity, whereas non-HBCU faculty with funded scholarly activity were rewarded with a 4% increase in salary compared to faculty without any funded scholarly activity. It is evident that only funded scholarly activity is valued at HBCUs and non-HBCUs.

Table 23: Regression coefficients – Career scholarly activities

Variable	Regression coefficients	
	HBCU	non-HBCU
Career articles – refereed journals	-0.0013	0.0009
Career articles – non refereed journals	0.0008	-0.0004
Career book reviews, chapters, creative works	0.0058	0.003
Career books, text books, reports	0.0006	-0.001
Career presentations	0.0013	8.2E-05
Career exhibitions, performances	-0.0015	4.9E-05
Career patents, computer software	0.005	0.007

Career scholarly activities

An additional career article in refereed journals reduced HBCU faculty salary by 0.13% and increased non-HBCU faculty salary by 0.09%. An additional career article in non refereed journals was not as valuable at non-HBCUs with a 0.04% reduction in faculty salary, and the difference was not statistically significant at HBCUs. An increase in each career book review/chapter/creative work contributed to 0.6% increase in HBCU faculty salary and 0.3% increase in non-HBCU faculty salary. An additional career book/text book/report was not valuable at non-HBCUs with a 0.1% reduction in faculty salary, and the difference was not statistically significant at HBCUs. Each additional career presentation increased HBCU faculty salary by 0.13% and non-HBCU faculty salary by 0.01%. An additional career exhibition/ performance resulted in 0.2% decrease in HBCU faculty salary at and 0.01% increase in non-HBCU faculty salary. An additional career patent/computer software increased non-HBCU faculty salary by 0.7% and the difference was not statistically significant for HBCU faculty.

Table 24: Regression coefficients – Recent scholarly activities

Variable	Regression coefficients	
	HBCU	non-HBCU
Recent articles – refereed journals	0.016	0.0001
Recent articles – non refereed journals	0.011	0.003
Recent book reviews, chapters, creative works	-0.054	-0.009
Recent books, text books, reports	0.014	0.009
Recent presentations	2.2E-05	0.002
Recent exhibitions, performances	-0.0007	-0.0008
Recent patents, computer software	-0.047	-0.015

Recent scholarly activities

An additional recent article in refereed journals, increased HBCU faculty salary by about 2%, and increased non-HBCU faculty salary by 0.01%. Each additional recent article in non refereed journals, increased HBCU faculty salary by about 1%, and increased non-HBCU faculty salary by 0.3%. An increase in each recent book review/chapter/creative work resulted in a 5% decrease in HBCU faculty salary and 0.09% decrease in non-HBCU faculty salary. An additional recent book/text book/report increased HBCU faculty salary by 1.4% and non-HBCU faculty salary by 0.9%. Each additional presentation increased non-HBCU faculty salary by 0.2% and the difference was not significant at HBCUs. An additional recent exhibition/ performance decreased non-HBCU faculty salary by 0.08% and the difference was not significant at HBCUs. An additional recent patent/computer software decreased HBCU faculty salary by about 5% and non-HBCU faculty salary by about 2%.

Table 25: Regression coefficients - Carnegie classification

Variable	Regression coefficients	
	HBCU	non-HBCU
<i>Carnegie classification</i>		
Carnegie doctoral institution	-0.139	0.046
Carnegie baccalaureate institution	-0.121	-0.053
Carnegie masters institution is the reference category		

Carnegie classification

HBCU faculty at Carnegie doctoral and Carnegie baccalaureate institutions earned on average about 14% and 12% less than faculty at Carnegie masters institutions. Non-HBCU faculty at Carnegie doctoral institutions earned about 5% more than faculty at Carnegie masters institutions and faculty at Carnegie baccalaureate institutions earned about 5% less than faculty at Carnegie masters institutions.

Table 26: Regression coefficients – Region and Institution control

Variable	Regression coefficients	
	HBCU	non-HBCU
<i>Region</i>		
Southeast	-0.174	-0.076
Great Lakes	-0.205	-0.048
Southwest	-0.125	-0.091
New England	0.00	-0.043
Plains	0.00	-0.087
Rocky Mountains	0.00	-0.092
Far West	0.00	-0.012
Mid East is the reference category		
<i>Institution control</i>		
Private not-for-profit	-0.122	-0.042
Public is the reference category		

Region

HBCU faculty who were employed at institutions in the Southeast, Great Lakes, and Southwest regions of the country earned about 18%, 20% and 13% less compared to faculty who worked at HBCUs in the Mid East region of the country. Non-HBCU faculty who were employed at institutions in the Southeast, Great Lakes, Southwest, New England, Plains, Rocky Mountains, and Far West regions of the country earned about 8%, 5%, 9%, 4%, 9%, 9%, and 1% less compared to faculty who worked at institutions in the Mid East region of the country. Regional effects on faculty salaries were more severe at HBCUs than non-HBCUs. The reductions at HBCUs in the Southeast and Great Lakes regions were two and four times the reductions at non-HBCUs.

Institution control

Faculty at private not-for-profit HBCUs earned about 12% less than faculty at public HBCUs. Non-HBCU faculty at private not-for-profit institutions earned about 4% less than faculty at public institutions. The effect of institutional control was more pronounced at HBCUs than non-HBCUs. This may also be due to low endowments at private HBCUs.

Table 27: Regression coefficients - Finance variables

Variable	Regression coefficients	
	HBCU	non-HBCU
<i>Finance variables</i>		
Endowment per student	2.0E-06	1.0E-07
Percent with any financial aid	0.0020	-0.0008
Average amount of institutional aid	2.1E-05	1.0E-05
Debt ratio	-0.065	-0.059

Finance variables

An increase in the endowment per student of \$10,000 would increase HBCU faculty salary by 2%, and an increase in the endowment per student of \$100,000 would increase the non-HBCU faculty salary by 1%. A 10% increase in the percentage of students receiving any financial aid would increase HBCU faculty salary by 2%, and a 10% increase in the percentage of students receiving any financial aid would decrease non-HBCU faculty salary by 0.8%. An increase of \$1,000 in institutional grant aid would increase HBCU faculty salary by 2%, and an increase of \$1,000 in institutional grant aid would increase non-HBCU faculty salary by 1%. A 10% increase in the debt ratio of HBCUs would decrease the faculty salary by 6.5%. However this was not statistically significant. A 10% increase in the debt ratio non-HBCUs would reduce the faculty salary by about 6%.

Research Question 3

3) To what extent does the Blinder-Oaxaca wage decomposition model explain the salary differential between faculty at HBCUs and non-HBCUs?

In this study, the Blinder-Oaxaca decomposition model explains 82% of the salary difference between HBCU and non-HBCU faculty. The complete decomposition results are included as Appendix VIII. The log salary for faculty at non-HBCUs was 11.1139 and log salary for faculty at HBCUs was 10.9917. The difference was 0.1222. The Blinder-Oaxaca decomposition procedure was used to explain this difference in the log salary of faculty at HBCUs and non-HBCUs.

Non-HBCU coefficients as standard

The model can be summarized as:

$$(\hat{W}^{\text{non-HBCU}}) - (\hat{W}^{\text{HBCU}}) = [(X_{ij}^{\text{non-HBCU}} - X_{ij}^{\text{HBCU}}) \beta_{ij}^{\text{non-HBCU}}] +$$

$$[(\beta_0^{\text{non-HBCU}} - \beta_0^{\text{HBCU}}) + (\beta_{ij}^{\text{non-HBCU}} - \beta_{ij}^{\text{HBCU}}) X_{ij}^{\text{HBCU}}]$$

The first term is the portion of the salary gap explained by differences in the characteristics of the faculty at HBCUs and non-HBCUs. In this procedure faculty at HBCUs and non-HBCUs are paid according to the non-HBCU faculty salary structure. The model explains the degree of under payment of HBCU faculty with respect to non-HBCU faculty. The second term has many interpretations. It is the portion of the salary gap that cannot be explained by the differences in the characteristics of the faculty at HBCUs and non-HBCUs. It may be due to variables not included in the model. It is also referred as the portion of the salary gap due to the different reward structures at HBCUs and non-HBCUs for similar faculty characteristics.

Differences in the characteristics of faculty at HBCUs and non-HBCUs explained 0.0998 of the 0.1222 gap or 82% of the salary difference, and differences in the reward structure of faculty at HBCUs and non-HBCUs explained 18% of the salary gap. This implies that as long as the differences in the characteristics of faculty at HBCUs and non-HBCUs remain the same, and all faculty are paid according to the non-HBCU faculty salary structure, the salary gap can only be reduced by 18%.

During the initial decomposition analysis, the regional variables New England, Plains, Rocky Mountains and Far West were not included because they were dropped by the HBCU regression. HBCUs are not located in these regions and the regression did not find value in adding these variables. This resulted in the decomposition explaining 95% of the salary gap. After rechecking, these variables were added to the decomposition with zero values for the mean. However the non-HBCU regression coefficients were

negative and the effect of adding these variables to the decomposition was to reduce the explained portion to 82%.

Table 28: Contribution to salary gap based on non-HBCU faculty salary structure

Variables	Percent explained
Education	8.40
Employment	15.19
Demographic	-5.96
Productivity	29.44
Institution	34.77
Total	81.84

The education variables explained 8%, employment variables 15%, productivity variables 29%, and institution variables 35% of the difference in log salary. The demographics variables worked to lower the salary gap by 6% (as indicated by the negative sign in the table). In other words, differences in the demographic variables did not help to explain the gap in non-HBCU faculty salary and HBCU faculty salary, but rather worked in the opposite direction.

Education variables

Highest degree earned

Differences in highest degree (doctorate, first professional, masters) earned explained 6% of the salary gap between faculty at HBCUs and non-HBCUs. In this study, doctorate degree was the reference category. There was 3.5% more non-HBCU faculty with first professional degree and non-HBCUs paid them a premium of 17%, and

thus this category explained 5% of the salary gap. Additionally, there was 2.5% fewer non-HBCU faculty with masters degree and non-HBCUs charged them a penalty of 3%, and thus this category explained about 1% of the salary gap. Therefore, these two highest degree earned categories together explained about 6% of the salary gap. However, if first professional degree was used as the reference category, the regression coefficients would be different for doctorate degree and masters degree, the other two dummy variables for highest degree earned. In this case, masters degree would explain 4% of the salary gap and doctorate degree would explain 2% of the salary gap. Again, these two categories together explain about 6% of the salary gap. Hence it usual practice to report the explained portion due to the highest degree earned variable without trying to explain the difference due to doctorate, first professional or masters categories. This is commonly referred to as identification problem (Oaxaca & Ransom, 1999) Henceforth, only the total portion explained by the variable will be reported and not the effect due to each dummy variable.

Employment variables

Principal activity

Differences in principal activity (teaching, research, and administration) explained 4% of the salary gap. In this study, teaching was the reference category. There was 18% more non-HBCU faculty whose principal activity was research and they earned a premium of 3% at their institutions. All categories combined accounted for 4% of the salary gap.

Rank

Differences in rank (Professor, Associate Professor, Assistant Professor) explained 16% of the salary gap. In this study, Associate Professor was the reference category. There was 14% more Professors at non-HBCU and they were paid a premium of 15% at their institutions. All categories combined to explain 16% of the salary gap.

Contract length

Differences in contract length (9/10 month, 11/12 month) explained 7% of the salary gap. In this study, 9/10 month contract was the reference category. There was about 11% more non-HBCU faculty with 11/12 month contract who were paid about 8% extra and this difference accounted for 7% of the salary gap.

Productivity variables

Time spent on undergraduate instruction

Differences in the percentage of time spent on undergraduate instruction explained 22% of the salary gap. This was the variable that explained a significant portion of the salary gap between faculty at HBCUs and non-HBCUs. Time spent on undergraduate instruction is not highly valued at non-HBCUs, and faculty at HBCUs spend more time on undergraduate instruction than faculty at non-HBCUs. HBCU faculty spend about 10% more time on undergraduate instruction and non-HBCUs charged them a penalty of 3% for that which accounted for 22% of the salary gap.

Career articles in refereed journals

Differences in career articles in refereed journals explained 8% of the salary gap. Non-HBCU faculty had on average about 13 more career articles in refereed journals and

non-HBCUs paid faculty a premium of 0.09% and that accounted for 8% of the salary gap.

Career book reviews/chapters/creative works

Differences in career book reviews/chapters/creative works explained about 6% of the salary gap. Faculty at non-HBCUs had about three more career book reviews/chapters/creative works and received a premium of 0.3% which explained 6% of the salary gap.

Institution variables

Carnegie classification

Differences in Carnegie classification explained 21% of the salary gap. In this study, masters institution was the reference category. There was about 38% more non-HBCU faculty working in doctoral institutions and about 16% fewer working in baccalaureate institutions. Non-HBCUs paid faculty at doctoral institutions a premium of 5% and charged faculty at baccalaureate institutions a penalty of 5%. Together they accounted for 21% of the salary gap.

Finance variables

Differences in the average amount of institutional grant aid explained 18% of the salary gap. Differences in endowment per student and debt ratio explained about 3%, and 0.3% of the salary gap.

HBCU coefficients as standard

Although not frequently used in explaining the differences between two groups, the wage decomposition model can also be written as

$$(\hat{W}^{\text{non-HBCU}}) - (\hat{W}^{\text{HBCU}}) = [(X_{ij}^{\text{non-HBCU}} - X_{ij}^{\text{HBCU}}) \beta_{ij}^{\text{HBCU}}] + [(\beta_0^{\text{non-HBCU}} - \beta_0^{\text{HBCU}}) + (\beta_{ij}^{\text{non-HBCU}} - \beta_{ij}^{\text{HBCU}}) X_{ij}^{\text{non-HBCU}}]$$

In this equation faculty at HBCUs and non-HBCUs are paid according to the HBCU faculty salary structure. The model explains the degree of over payment of non-HBCU faculty with respect to HBCU faculty. Differences in the characteristics of faculty at HBCUs and non-HBCUs explained 0.09325 of the 0.1222 gap or 76% of the salary difference, and differences in the reward structure of faculty at HBCUs and non-HBCUs explained 24% of the salary gap. This implies that as long as the differences in the characteristics of faculty at HBCUs and non-HBCUs remain the same and all faculty are paid according to the HBCU faculty salary structure, the salary gap can be reduced by 24%.

Table 29: Contribution to salary gap based on HBCU faculty salary structure

Variables	Percent explained
Education	14.37
Employment	31.89
Demographic	-17.66
Productivity	-6.50
Institution	54.34
Total	76.44

The education variables explained 14%, employment variables 31%, and institution variables 54% of the difference in log salary. The demographic and productivity variables worked to lower the salary gap by 18% and 7% (as indicated by the negative sign in the table). In other words, differences in the demographic and productivity variables did not help to explain the gap in non-HBCU faculty salary and HBCU faculty salary, but rather worked in the opposite direction.

Education variables

Highest degree

Differences in highest degree (doctorate, first professional, masters) earned explained 14% of the salary gap between faculty at HBCUs and non-HBCUs. In this study, doctorate degree was the reference category. There was about 3.5% more non-HBCU faculty with a first professional degree and HBCUs paid them a premium of 42%. All categories of the highest degree earned together accounted for 14% of the salary gap.

Employment variables

Principal activity

Differences in principal activity (teaching, research, and administration) explained 15% of the salary gap. In this study, teaching was the reference category. There was about 18% more non-HBCU faculty whose principal activity was research and HBCUs paid them a premium of 11%. All categories combined to explain 15% of the salary gap.

Rank

Differences in rank (Professor, Associate Professor, Assistant Professor) explained 21% of the salary gap. In this study, Associate Professor was the reference category. About 14% more non-HBCU faculty were at the Professor rank, and HBCUs

paid them a premium of 19%. All categories together accounted for 21% of the salary gap.

Contract length

Differences in contract length (9/10 month, 11/12 month) explained 8% of the salary gap. About 11% more non-HBCU faculty were on 11/12 month contract and HBCUs paid them a 9% premium, thereby accounting for 8% of the salary gap.

First postsecondary job

Differences in first postsecondary job explained 5% of the salary gap. About 6% more non-HBCU faculty who started their first postsecondary job and HBCUs paid new faculty a premium of 11% accounting for 5% of the salary gap.

Productivity variables

Time spent on undergraduate instruction

Differences in the percentage of time spent on undergraduate instruction explained 16% of the salary gap. HBCU faculty spent about 10% more of their time on undergraduate instruction and HBCUs charged a 2% penalty which accounted for 16% of the salary gap.

Career book reviews/chapters/creative works

Differences in career book reviews/chapters/creative works explained about 14% of the salary gap. Non-HBCU faculty had about three more career book reviews/chapters/creative works and HBCUs paid a premium of 0.6% which accounted for 14% of the salary gap.

Career presentations

Differences in career presentations explained 20% of the salary gap. Non-HBCU faculty had about 19 more career presentations and HBCUs paid a premium of 0.13% which explained 20% of the salary gap.

Recent articles in refereed journals

Differences in recent articles in refereed journals explained 19% of the salary gap. Non-HBCU faculty had one more recent article in refereed journals and HBCUs paid a premium of 1.6% which accounted for 19% of the salary gap.

Institution variables

Finance variables

Differences in endowment per student explained 64% of the salary gap. The average endowment per student at non-HBCUs was \$39,085 more and HBCUs paid their faculty about 2% more for every \$10,000 increase in endowment per student. This accounted for 64% of the salary gap. Differences in the average amount of institutional grant aid explained 39% of the salary gap. Differences in debt ratio explained about 0.38% of the salary gap.

Validation

Based on the NSOPF dataset, the average salary of faculty at HBCUs was \$62,982, and the average salary of faculty at non-HBCUs was \$73,705. The average faculty salary at HBCUs was about 17% lower than the average faculty salary at non-HBCUs. The average salaries from NSOPF 2004 were validated against information in IPEDS. The average salary of faculty at HBCUs was \$61,569 and at non-HBCUs \$72,531. The difference in salaries was 18%. In the NSOPF dataset, the percentage of

male and female faculty at HBCUs was 64.5% and 35.5% respectively, and at non-HBCUs 68.3% and 31.7%. In the IPEDS dataset, the percentage of male and female faculty at HBCUs was 62.3% and 37.7% and at non-HBCUs 66.7% and 33.3%.

As a further analysis all doctoral institutions were excluded from the NSOPF data, and the average faculty salary at HBCUs and non-HBCUs was calculated. With only masters and baccalaureate institutions, the average faculty salary of \$62, 187 at HBCUs was about 5% higher than the average faculty salary of \$59,428 at non-HBCUs.

This section reported the results of the data analyses and validated of the NSOPF dataset with the IPEDS data. The next section addresses the recommendations and conclusions.

CHAPTER FIVE

Summary, conclusions, and recommendations

The purpose of this study was to determine the faculty characteristics and faculty salary structure at Historically Black Colleges and Universities (HBCUs) and non-HBCUs, and use the Blinder-Oaxaca decomposition model to explain the reasons for the difference in average faculty salary at HBCUs and non-HBCUs. This chapter presents a summary of the study and discusses the results presented in Chapter 4. It also provides implications and limitations and recommendations for future research.

Summary of the study

According to National Center of Education Statistics (NCES, 2004), the average salaries of full-time instructional faculty on 9-month contracts at Historically Black Colleges and Universities (HBCUs) were only 81% of what they were in all institutions. The observed difference in average salaries can be due to many factors such as Carnegie classification, type of institutional control, geographical location of the institution, the faculty members' academic discipline or experience. Even a small gap in salaries may be due to differences in training, experience, academic discipline, research productivity, and teaching load. The purpose of this research was to study the determinants of faculty salary at HBCUs and explore the utility of the Blinder-Oaxaca econometric wage decomposition model to explain the difference in the average salary of faculty at HBCUs and the average salary of faculty at non-HBCUs.

The research questions for the study were:

- 1) To what extent do characteristics of faculty at HBCUs differ from characteristics of faculty at non-HBCUs (in terms of education, employment, demographics, productivity, and institution variables)?
 - a) What are the characteristics of faculty at HBCUs?
 - b) What are the characteristics of faculty at non-HBCUs?
- 2) To what extent do the salaries of faculty at HBCUs and non-HBCUs differ with respect to the education, employment, demographics, productivity, and institution variables?
 - a) What are the determinants of faculty salary at HBCUs?
 - b) What are the determinants of faculty salary at non-HBCUs?
- 3) To what extent does the Blinder-Oaxaca wage decomposition model explain the salary differential between faculty at HBCUs and non-HBCUs?

The National Study of Postsecondary Faculty (NSOPF): 2004 employed a two-stage sampling methodology for selection of eligible faculty and instructional staff to determine their education, employment, demographics, and productivity characteristics. Institutional characteristics were also compiled and analyzed. At the first stage, the institutional frame included 3,380 Title IV participating post-secondary institutions that were two year and four year, public and private not-for-profit, and located in the 50 states and District of Columbia. At the second stage, the faculty frame included all faculty and instructional staff in those institutions totaling approximately 1.1 million individuals (NCES, 2006). The NSOPF: 2004 consisted of a sample of about 34,330 faculty and instructional staff across a sample of 1,070 post-secondary institutions. A total of 26,110

faculty completed the survey with a 76% response rate. Next analysis weights were determined for responding faculty to reflect the selection probabilities of institutions that provided faculty lists and selection of faculty members within sampling institutions. Survey weights were determined to remove any bias that might result due to differential nonresponse and undercoverage (NCES, 2006). The faculty analysis weights (WTA00) were used to determine the final weighted sample size as 12,050 faculty at HBCUs, and 351,250 faculty at non-HBCUs.

The NSOPF data set had not been used to analyze faculty salaries at HBCUs. The NSOPF: 2004 restricted-use data set was used in this study. The Institute of Education Sciences (IES) uses the term restricted-use data for research data that has individually identifiable information, which is confidential and protected by law. Institutions are coded by Carnegie type in the NSOPF survey. There is no code for HBCUs in the NSOPF survey, so the HBCU identifier in Integrated Postsecondary Education Data System (IPEDS) was used to identify the HBCU institutions in the NSOPF dataset for this study. Since the NSOPF was not designed to be institution specific, the researcher also selected the HBCU institutions by setting the variable Black non-Hispanic student enrollment at 50% or higher in the NSOPF dataset. The institutions selected as HBCUs were the same in both procedures, resulting in a total of 30 HBCUs (due to secrecy agreement with NCES, the number is rounded to the nearest tenth). Faculty information from the HBCU group was compared with faculty information from the non-HBCU group of institutions which totaled 580 institutions (due to secrecy agreement with NCES, the number is rounded to the nearest tenth). Only four year Carnegie doctoral, masters, and baccalaureate liberal arts and general institutions were included in the study.

Associates colleges, and specialized institutions including theological seminaries, medical schools and medical centers, separate health profession schools, schools of business and management, schools of art, music, and design, schools of engineering and technology, schools of law, teachers colleges, and tribal colleges and universities were excluded from the study.

Financial variables that were not available in the NSOPF dataset were merged from the IPEDS dataset. The percentage of students receiving any financial aid, percentage receiving institutional grant aid, average amount of institutional grant aid received, total liabilities, total assets, and endowment assets of all the institutions in this study were merged into the NSOPF: 2004 dataset from the IPEDS dataset. The debt ratio and endowment per student were calculated as the ratio of total liabilities and total assets, and endowment assets and total enrollment.

The mean of the education, employment, productivity, demographics, and institution variables was calculated. A multiple regression was conducted with the natural logarithm of annual salary (9/10 month contract or 11/12 month contract) as the dependent variable and the various demographic, employment, education, productivity, and institution variables as the independent variables. The Blinder-Oaxaca wage decomposition model was used to explain the gap in the log salary of faculty at HBCUs and non-HBCUs. The decomposition was done using both the non-HBCU regression coefficients and the HBCU regression coefficients as standard.

Using non-HBCU regression coefficients as standard, differences in the characteristics of faculty at HBCUs and non-HBCUs explained 0.0998 of the 0.1222 gap or 82% of the salary difference, and differences in the reward structure of faculty at

HBCUs and non-HBCUs explained 18% of the salary gap. This implies that as long as the differences in the characteristics of faculty at HBCUs and non-HBCUs remain the same, and all faculty are paid according to the non-HBCU faculty salary structure, the salary gap can only be reduced by 18%. Using HBCU regression coefficients as standard, differences in the characteristics of faculty at HBCUs and non-HBCUs explained 0.09325 of the 0.1222 gap or 76% of the salary difference, and differences in the reward structure of faculty at HBCUs and non-HBCUs explained 24% of the salary gap. This implies that as long as the differences in the characteristics of faculty at HBCUs and non-HBCUs remain the same and all faculty are paid according to the HBCU faculty salary structure, the salary gap can be reduced by 24%.

This study found differences in the characteristics of faculty, and faculty salary structure at HBCUs and non-HBCUs. The differences are summarized below.

Education variables

Faculty at non-HBCUs were more likely to have a first professional degree (5.5% vs. 2%) and less likely to have just a masters degree compared to faculty at HBCUs. This may be because HBCUs do not offer programs that require faculty to have a first professional degree. However, HBCUs were willing to pay a higher premium for faculty with a first professional degree (M.D., J. D., LL.B.) than non-HBCUs. Faculty who had earned their highest degree from a Carnegie Research I institution were more likely to work at non-HBCUs than HBCUs. This may be because HBCUs are traditionally teaching oriented institutions and faculty interested in research may not expect HBCUs to support their research agenda, and prefer not to work at HBCUs. (Research I institutions give high priority to research, award 50 or more doctoral degrees each year, and receive \$40 million or more in federal support every year). However, HBCUs were willing to pay a

higher premium for faculty who had earned their highest degree from a Carnegie Research II institution, probably to maximize their prestige. (Research II institutions give high priority to research, award 50 or more doctoral degrees each year, and receive \$15.5-million to \$40-million in federal support every year). Thus about 8% of the salary gap may be attributed to the differences in education variables.

Employment variables

Faculty members starting their academic careers were less likely to work at HBCUs compared to non-HBCUs. However, HBCUs were willing to pay a higher premium for faculty starting their academic career at their institutions. This may be to attract new graduates who may bring in their own research agenda to the institution. Faculty at HBCUs were more likely to have teaching as their principal activity and less likely to have research as their principal activity. However, faculty whose principal activity was research were more valued at HBCUs. Faculty at HBCUs were less likely to hold the rank of Professor and more likely to hold the rank of Associate Professor. This shortage of Professors at HBCUs may be the reason Professors received a higher premium at HBCUs than non-HBCUs.

Faculty at HBCUs were more likely to be union members than faculty at non-HBCUs. Unionized HBCU faculty earned 6% less than non unionized HBCU faculty. This is not consistent with prior findings that in all institutions, unionized faculty earned more than non-unionized faculty (Barbezat , 1989; Ashraf, 1992; and Monks, 2000). It is not clear why salaries of unionized HBCU faculty were lower than non unionized faculty. It is possible that unionized faculty may have negotiated for higher benefits rather than higher salaries. Faculty at HBCUs were less likely to be tenured and more likely to be on tenure track. HBCU faculty on tenure track were paid a premium over tenured faculty. It may be

HBCU faculty on tenure track are new hires being paid at the current market value and this is evidence of salary compression. Faculty at HBCUs were more likely to be on 9/10 month contract, and HBCU faculty on 11/12 month contract received a higher premium than non-HBCU faculty. HBCU faculty had longer academic experience than faculty at non-HBCUs and experience was more valued at HBCUs than at non-HBCUs. Faculty in business and engineering were paid more at HBCUs and at non-HBCUs, compared to faculty in other academic disciplines. Faculty in social sciences and other programs were more valued at HBCUs than at non-HBCUs. This may be because a majority of HBCUs are teaching oriented baccalaureate liberal arts institutions. It may also be that there are more female faculty in the social sciences discipline, and the effect of comparable worth is lower at HBCUs than at non-HBCUs, and this may also explain the lower gender pay gap at HBCUs compared to non-HBCUs.

Demographic variables

HBCUs had a higher proportion of female faculty than non-HBCUs. HBCU faculty as a whole tend to be more ethnically diverse than non-HBCU faculty. There was a higher proportion of foreign born faculty at HBCUs than non-HBCUs. It is possible that foreign born faculty work in the STEM (Science, Technology, Engineering, and Math) areas at HBCUs where there is a shortage of African American faculty. Asian/Pacific Islander faculty were more valued at HBCUs than at non-HBCUs as evidenced by their higher salaries. It is possible that a majority of foreign born faculty working at HBCUs are Asian/Pacific Islanders. Finally, as a whole, HBCU faculty were slightly older than non-HBCU faculty. Although there is no clear reason, this may be because of loyalty to institution and ties to African American community. Further, older HBCU faculty may be less mobile than their non-HBCU counterparts because for many

African American faculty working at a HBCU is a way of giving back to the communities and institutions that nurtured them (Fields, 2000).

Productivity variables

Faculty at HBCUs spent more time on undergraduate instruction than graduate instruction. This is not surprising because many HBCUs do not offer graduate programs. HBCU faculty also spent less time on research activities. Time spent on instruction or research activities were not valued at either HBCUs or non-HBCUs. There was a penalty on salary for time spent on instruction or research activities at HBCUs and non-HBCUs. It was surprising that the percentage of faculty with funded scholarly activity was about the same at HBCUs and non-HBCUs. Faculty with funded scholarly activity received a higher premium at HBCUs than at non-HBCUs. This may be because HBCUs are competing with non-HBCUs for federal and corporate research monies and faculty who can secure external grants are rewarded suitably for their efforts. Non-HBCU faculty had more career articles in referred journals and non referred journals, book reviews/chapters/creative works, presentations, recent articles in referred journals and presentations. Faculty with career book reviews/chapters/creative works and career presentations received a higher premium at HBCUs. However, faculty with recent articles in refereed journals were more valued than faculty with recent book reviews/chapters/creative works. This may be a reflection of the shift in the trend to support more research at HBCUs.

Institution variables

Non-HBCU faculty were more likely to work in Carnegie doctoral institutions and HBCU faculty were more likely to work in Carnegie masters and baccalaureate

institutions. This is not surprising because there are not many HBCU doctoral institutions. Non-HBCU faculty working in Carnegie doctoral institutions were paid a premium over faculty working in other types of institutions. However, HBCU faculty at corresponding Carnegie doctoral institutions did not receive similar premiums. HBCU faculty were more likely to work in public institutions. Faculty working in public institutions earned more than faculty working in private institutions. HBCU faculty were more likely to work in the Mid East and Southeast regions of the country, because majority of HBCUs are in the south. Faculty working at HBCUs and non-HBCUs in the Mid East region earned more than faculty working at institutions in other regions of the country. This may be because the cost of living index is higher in the Mid East region when compared to other regions. Further, HBCUs are predominantly in the Southeast, Mid East, and Southwest regions. Blau (as cited in Jackson & Clark, 1987) attributed the lower salaries in the South to the lower cost of living. The other explanation for lower salaries is the particularistic culture of the South that does not value education as much as the universalist culture in the other regions of the country (Jackson & Clark, 1987).

HBCUs had a higher percentage of students receiving any financial aid. The positive regression coefficient for this variable in the HBCU faculty salary structure indicates that an increase in the percentage of students with any financial aid contributed to a slight increase in faculty salary. It is possible that the financial aid freed up some monies for faculty salaries. The effect was the opposite at non-HBCUs because the regression coefficient in the non-HBCU faculty salary structure was negative. Non-HBCUs had higher percentages of students receiving institutional grants, higher average amounts of institutional grant aid per student, and a larger endowment per student. The

larger endowments may have allowed the institutions to give better financial aid packages to students. It appears non-HBCUs share their wealth with faculty and students. Higher faculty salaries at non-HBCUs may attract top quality faculty and this may in turn attract students to seek admissions at these institutions. Thus, higher paid quality faculty can be a successful recruiting tool for enrollment management personnel.

Results of the salary decomposition

The difference in the average salary of faculty at HBCUs and non-HBCUs was about 17%. Using non-HBCU faculty salary structure as the benchmark, differences in characteristics of faculty at HBCUs and non-HBCUs explained 82% of the salary gap, and differences in the reward structures at HBCUs and non-HBCUs explained 18% of the salary gap. On the other hand, using HBCU faculty salary structure as the benchmark, differences in characteristics of faculty at HBCUs and non-HBCUs explained 76% of the salary gap, and differences in the reward structures at HBCUs and non-HBCUs explained 24% of the salary gap. The characteristics of faculty valued at non-HBCU and HBCU are different and thus the different values for the percentage of salary gap explained using the two salary structures.

Percentage of time spent on undergraduate instruction explained 23% of the salary gap with non-HBCU salary structure as standard. Time spent on undergraduate instruction is not valued at non-HBCUs, and HBCU faculty spent a higher percentage of time on undergraduate instruction than their non-HBCU counterparts. Human capital variables accounted for 36% of the salary gap using non-HBCU coefficients as standard, and 24% of the salary gap using HBCU coefficients as standard. Human capital variables included all education and productivity variables, age, years since began first faculty or

instructional staff job, first postsecondary job, principal activity, and years held in current job. Education and employment variables accounted for 8% and 15% respectively of the salary gap with non-HBCU coefficients as standard, and 14% and 32% of the salary gap with HBCU coefficients as the standard. Thus, it appears that human capital variables were more valued at non-HBCUs than HBCUs. Productivity variables accounted for 29% of the salary gap with non-HBCU coefficients as standard, and had no effect with HBCU coefficients as standard, indicating that productivity variables were more valued at non-HBCUs than HBCUs.

Carnegie classification and percentage of students with any financial aid did not explain the salary gap with non-HBCU coefficients as standard because the effect of the differences was negative for these variables and thus worked to lower the salary gap. Institutional characteristics accounted for 35% of the salary gap with non-HBCU coefficients as standard, and 54% of the salary gap with HBCU coefficients as the standard. Carnegie classification, average amount of institutional grant, and percentage of students with any financial aid accounted for 21%, 18%, and 5% of the salary gap with non-HBCU faculty salary structure as standard. Average amount of institutional grant accounted for 39% of the salary gap with HBCU coefficients as the standard. Endowment per student accounted for about 3% of the salary gap with non-HBCU coefficients as standard, and 64% of the salary gap with HBCU coefficients as standard. Thus, endowment per student was more valued at HBCUs than at non-HBCUs. This is not surprising since the average endowment per student at non-HBCUs was more than six times the average endowment per student at HBCUs.

Findings related to the literature

Demographics variables

Some of the characteristics of faculty at HBCUs in this study are very similar to those reported by Betsey (2007) using the NSOPF 1999 dataset. In 1999, Black non-Hispanic faculty were 61% of full-time instructional faculty at HBCUs and 3.8% of non-HBCU faculty. Women were about 35.5% of HBCU faculty and 36.2% of non-HBCU faculty. The average age of faculty at HBCUs and non-HBCUs was 51 and 49 respectively. In this study using the NSOPF 2004 dataset, Black/African-American faculty were 60% of full-time instructional faculty at HBCUs and 3.7% of non-HBCU faculty. Women were about 35.5% of HBCU faculty and 31.7% of non-HBCU faculty. The average age of faculty at HBCUs and non-HBCUs was 53 and 50 respectively. The data are consistent from the earlier study and no abnormal information was observed.

This study found the gender pay gap to be 1% lower at HBCUs compared to non-HBCUs. This reiterates the conclusions of Renzulli et al. (2006) that the gender pay gap was smaller at HBCUs compared to non-HBCUs. Renzulli et al. (2006) worked with IPEDS data and were unable to link individual salaries to faculty credentials, productivity, teaching load, and other variables. This study was able to link faculty salaries with other variables such as faculty credentials, productivity using the NSOPF dataset and thus adds value to Renzulli et al.'s conclusions. This study's findings are not consistent with the findings of Ngwainmbi (2006) and Monks & Robinson (2000) who reported that foreign born faculty are under- paid at HBCUs and all institutions. There was no statistically significant difference in the salary of foreign born and US born faculty at HBCUs and non-HBCUs. Asian/Pacific Islander faculty were paid on average

9% more than Black/African American faculty at HBCUs. As explained earlier, this may be because Asian/Pacific Islander faculty are in the STEM areas, where the salaries are usually higher in the academic market.

Although this study did not calculate salaries of faculty by rank and ethnicity, as did Ashraf and Shabbir (2006), Blacks/African American faculty were paid higher than American Indian/Alaskan native, Asian/Pacific Islander, Hispanic, and white faculty at non-HBCUs. Black/African American faculty comprise only about 3.7% of the faculty at non-HBCUs. As Ashraf and Shabbir (2006) suggested, African American faculty are still at a premium at non-HBCUs considering the large demand and the limited supply of African American academics. African American faculty earned 2% more than white faculty at non-HBCUs and 5% more at HBCUs. It is possible that white faculty accept positions at HBCUs at lower salaries for various personal or family reasons.

Employment variables

Betsey (2007) reported that in 1999 HBCU faculty were about 47% more likely to hold a doctoral degree than non-HBCU faculty members (58.7% vs. 40%). This study found the percentage of faculty at HBCUs and non-HBCUs in 2004 who hold a doctoral degree to be about the same at 85.6% and 84.6% respectively, so there has been a significant increase in faculty with doctoral degrees at HBCUs and at non-HBCUs from 1999 to 2004. Betsey (2007) also reported that in 1999 non-HBCU faculty were more than four times as likely to hold a first professional degree than HBCU faculty. This study found the difference to be smaller in 2004.

Although there was a higher percentage of HBCU faculty who were union members, it is surprising that unionized faculty earned about 6% less than non-unionized

faculty at HBCUs. At non-HBCUs, unionized faculty earned about 1% more than non-unionized faculty. This is in contrast to the higher premiums reported for unionized faculty in earlier studies (Ashraf, 1992; Monks, 2000). As mentioned earlier, the majority of HBCUs are in the South. Goodman (as cited in Jackson & Clark, 1987) explained the lower salaries to the historical pattern of paying lower wages and the South's traditional hostility to unionization. The negative wage premium may also be because unions usually find it difficult to bargain for higher salaries with Southern legislators who have never supported adequate funding for HBCUs. Consequently, unions may have negotiated for better fringe benefits and work environments which are not visible to taxpayers. Some unions have got lower teaching loads, more generous sabbatical leaves, higher summer salary, higher travel budget for attending conferences, and better retirement benefits (Ashraf & Williams, 2008; Ashraf, 1999). Therefore a further study is necessary to see how unionized HBCU faculty are compensated for this salary difference.

The percentage of Assistant Professors at both HBCUs and non-HBCUs was about 31%. The percentage of Associate Professor and Professor at HBCUs was 43% and 26% respectively, while at non-HBCUs the percentage of faculty members at the rank of Associate Professor was 29% and of Professor 39%. It appears that not many faculty are being promoted from Associate Professor rank to Professor at HBCUs. This confirms the report of Guy-Sheftall (2006) that fewer junior faculty get promoted to the full professor rank because of the institutional climate at HBCUs. This raises questions on the promotion and recruitment policies for faculty at HBCUs. Academic rank explained 17% to 21% of the difference in faculty salary at HBCUs and non-HBCUs in

the two decomposition models. This discrepancy should be explored to determine if the difference is due to a high turnover at the Professor level and if replacements are hired at the Associate Professor level with lower salaries. This could also explain the lower percentage of tenured faculty and higher percentage of faculty on tenure track at HBCUs compared to non-HBCUs. The tenure rate at HBCUs calculated in this study is different from the rates found by the Journal of Black Higher Education Foundation (Are the black colleges, 2004). In this study, about 56% of non-HBCU faculty were tenured. The JBHE Foundation found that the tenure rate was above the national average of 42.9% at seven institutions and below the national average at six institutions. No definite conclusions could be drawn from that study because of the low response rate for the survey.

Productivity variables

The negative regression coefficients for time spent on teaching undergraduate or graduate classes in HBCUs and non-HBCUs indicate that teaching is still undervalued regardless of the type of four year institution. This supports the conclusions of Fairweather (2005) and Melguizo & Strober (2007) that spending more time in classroom instruction means lower pay. Among all the productivity variables, the regression coefficients for funded scholarly activity was the highest at HBCUs and non-HBCUs indicating that this was the most valued scholarly activity in all institutions. The percentage of faculty with funded scholarly activity was about the same at both HBCUs and non-HBCUs (43% vs. 42%). HBCU faculty with funded scholarly activity received a slightly higher reward in salary than non-HBCU faculty with funded scholarly activity. As mentioned earlier, HBCUs may be trying to maximize their prestige by recruiting and rewarding faculty who can get federal, foundation, or corporate grants. Institutions

facing budget cuts are actively seeking external funding, and it is not surprising that faculty who can secure external funds are rewarded suitably.

Only about 3% of HBCU faculty reported their principal activity as research, compared to 21% of non-HBCU faculty. Although faculty at HBCUs had lower career presentations than non-HBCU faculty, career presentations were valued more at HBCUs. HBCU faculty had lower career articles in refereed journals; presentations may have been their method of communication of their scholarly findings. Career presentations explained about 20% of the salary difference using HBCU regression coefficient as standard. Recent articles in referred journals were valued higher at HBCUs and explained about 19% of the salary difference using HBCU regression coefficient as standard. This may even be a shift in the trend at HBCUs to value research more than teaching. The value for research in HBCUs is consistent with the findings of Massy (2003) and Fairweather (2005) that research remains highly valued in teaching-oriented institutions despite their declared missions. The results of this study also supports the conclusions of Melguizo & Strober (2007) that all types of institutions reward faculty publications. Betsy (2007), using the NSOPF 1999 dataset, found no significant differences in the short- or long-run research output between HBCU and non-HBCU faculty. However, this study found the differences in short and long run research output contributing to 13% to 17% of the salary difference.

Institution variables

Endowment per student explained only about 3% of the salary difference with non-HBCU regression coefficient as standard and 64% of the salary difference with HBCU regression coefficient as standard. The average value of endowment per student

at non-HBCUs was about six times the size of the average value of endowment per student at HBCUs and it is not surprising that endowment per student was highly valued at HBCUs. If the decomposition was done only with non-HBCU salary structure as standard, the effect of endowment per student would have gone undetected. Average amount of institutional grant explained 18% to 38% of the salary difference in the two decomposition models. The average amount of institutional grant at non-HBCUs was about one and half times the size of the average amount of institutional grant at HBCUs and thus it is not surprising that the average amount of institutional grant was highly valued at HBCUs.

The Blinder-Oaxaca decomposition model explained 82% and 76% of the salary difference between faculty at HBCUs and non-HBCUs using non-HBCU and HBCU faculty salary structure. The portion of the salary gap explained by differences in characteristics of faculty at HBCUs and non-HBCUs is substantial whether the non-HBCU or HBCU faculty salary structure is used.

Discussion

The difference in the average salary of faculty at HBCUs and non-HBCUs was about 17%. As explained earlier, 82% of the salary gap was due to differences in characteristics of faculty at HBCUs and non-HBCUs. The differences due to reward structures was 18%. Considering the limited resources HBCUs have, it is fair to say that HBCUs do pay their faculty reasonably well. It seems like HBCU faculty tend to compare their salaries with faculty salaries at doctoral institutions and feel they are not adequately compensated. There are only 103 HBCUs, but there are more than 3,000 non-HBCUs. Thus on average, the difference in faculty salaries due to different reward

structures of HBCUs and non-HBCUs is only 18% of the salary gap. When all doctoral institutions were excluded from the analysis, the average faculty salary at HBCUs was about 5% higher than the average faculty salary at non-HBCUs. Thus when faculty salaries at HBCU and non-HBCU masters and baccalaureate institutions were compared, HBCU faculty had on average slightly higher salaries. As explained earlier, there are more non-HBCU masters and baccalaureate institutions than HBCU masters and baccalaureate institutions and therefore, the average HBCU faculty salary is 5% higher than the average non-HBCU faculty salary. However, this salary gap could be due to reasons beyond the scope of this study.

Endowment

The obvious assumption for the difference in faculty salaries at HBCUs and non-HBCUs is the difference in endowment wealth. However, endowment per student did not explain a significant portion of faculty salaries at HBCUs and non-HBCUs and even in the decomposition with non-HBCU faculty salary structure as standard. This is because there are so few institutions with very high endowments and there are many institutions with low or no endowment wealth. As reported earlier, the median endowment per student at all private institutions is \$15,000 (Farrell, 2008). However, with HBCU faculty salary structure as standard in the decomposition, endowment per student explained a significant portion of the difference in faculty salaries at HBCUs and non-HBCUs. This may be because the average endowment per student at non-HBCUs is about seven times the average endowment per student at HBCUs. It appears that HBCUs manage to pay their faculty with whatever resources they have, and may not have

adequate resources for other expenditures such as student aid or new programs' implementation costs.

Theoretical constructs of faculty pay

This study used the NSOPF: 2004 dataset where faculty reported their salary for the academic year 2003-2004. As mentioned earlier, this study is not a longitudinal study and cannot determine the effects of outside influence such as state funding formula, economic recession, and other external factors on faculty salaries. However, the other two theoretical constructs of faculty pay, institutional forces and market models, seem to be relevant at HBCUs (Fairweather, 1995). Institutional forces view salaries as a means for administrators to reinforce behavioral norms. The fact that there are not enough faculty at the Professor rank at HBCUs implies administrators are controlling promotion and salary decisions to leverage faculty behavior. Two schools of thought drive the market model. The first model's assumption that institutions of all types value prospective and current faculty who show research promise or who produce high levels of scholarship holds true at HBCUs. HBCUs do pay a premium for faculty with strong research credentials. The second model's assumption that teaching-oriented institutions pay their most productive and highest quality teachers more than faculty members who publish and obtain external funding may not be true at HBCUs. It is not clear from this study whether the highest quality teacher is suitably compensated. However, there is no value for teaching at HBCUs that are teaching-oriented institutions, and faculty with research potential are compensated higher than faculty with less research credentials. The maximum faculty salary was \$250,000 at HBCUs and non-HBCUs which is

evidence of the winner-take-all approach where individuals with outstanding characteristics reap a disproportionate share of the rewards.

Teaching and Research

Contrary to the general belief that HBCUs are teaching institutions, the HBCU salary structure clearly indicates that faculty are not paid for teaching and research is valued more at these institutions. A future study can verify if there is any diminishing returns to time spent on research activities. As Kassiola (2007) reported, research activities in American higher education are a component of teaching excellence and the two should reinforce each other. They must not be assigned exclusively to separate institutions with different missions that deny goals that are synergistically related. Thus, research would improve grant funding and faculty excellence at HBCUs. As an example, Morehouse College, a Carnegie Baccalaureate – Liberal Arts HBCU, provides faculty with release time to do research, and also supports them to seek external funds and fellowships (Wilson-Mbajekwe, 2006). Alternatively, the definition of scholarship can be revised from research and teaching to discovery, integration, application, and teaching as Boyer (1990) proposed. It is likely that faculty at HBCUs will be more comfortable with such a broader definition of scholarship to show their skills rather than choose between research and teaching.

Faculty turnover

Faculty may decide to leave an institution for many reasons including lower salaries and/or unfavorable work conditions. In this study, faculty at public HBCUs earned 12% more than faculty at private HBCUs. According to Frederick Patterson Research Institute (2006), 428 of the 3,103 faculty at UNCF institutions left their

institutions in Fall 2003. The 14% turnover rate is cause for serious concern compared to the 2001-2002 average Associate Professor turnover rate of 4% at private Masters institutions, and 8% at private Baccalaureate institutions (Nagowski, 2006). Further, the UNCF report added that the average tenure rate at the UNCF institutions was 28%, which is half the tenure rate found in this study for all HBCUs. Although it is generally suggested that African American faculty stay at HBCUs because of a commitment to the African American community generally, and to HBCUs in particular, a future study is needed to determine the reasons for high turnover rate at private HBCUs. It is possible that younger faculty may not be happy with the salaries, lack of promotion opportunities, absence of peers with similar research agendas, teaching load or lack of support for research. Such issues remain a fertile area for future research.

Inequities in salary

HBCU faculty on tenure track earned 8% more than tenured faculty. This seems to be evidence of salary compression which is regarded as a form of discrimination. Therefore, tenured faculty at HBCUs have to address this issue with administrators to solve this problem. Despite more than three decades of research highlighting inequities in salary by gender, the trend still continues. Female faculty earn about 3% less than their male colleagues at HBCUs and 4% at non-HBCUs. This study did not conduct any multi level analysis and could not verify if the lower salaries of female faculty was because they were concentrated in lower academic ranks and denied promotion and tenure and/or if they had a higher teaching load and did not have time for research activities. A future study can analyze these differences.

Mission

HBCUs appear to be moving away from their principal mission; the education of African Americans. HBCUs now enroll more Hispanics, Asians and other foreign students. In Fall 2005, the undergraduate student population at National Association For Equal Opportunity in Higher Education (NAFEO, 2008) member institutions was Black, non-Hispanic 70.8%; White, non-Hispanic 14.6%; Latino/Hispanic 8.5%; Asian or Pacific Islander 2.2%; and Non-resident alien 2.1%. Many baccalaureate institutions offer masters programs and also have collaboration with educational institutions abroad to offer their degrees. In the past, HBCUs were limited to offering only undergraduate programs. HBCUs should translate their success at the undergraduate level to the graduate level. HBCUs have to start offering more graduate programs and doctoral degrees. There has to be a transformation from baccalaureate institutions to masters or doctoral institutions. Norfolk State University, a Masters I institution currently has two doctoral programs (Wilson-Mbajekwe, 2006). The shortage in supply of African American scholars can be mitigated if HBCUs offer doctoral degrees and African Americans can graduate with doctoral degrees from HBCUs. Faculty at HBCUs are good mentors for African American students, and faculty can guide the students through this process right from their first year of college. But the Board of Trustees of these institutions have to commit to this vision and goal of graduating more African Americans with terminal degrees (Jackson, 2002).

Research across many studies indicate that attendance at HBCUs is significantly associated with students' cognitive development, knowledge acquisition, persistence and degree attainment, graduating with honors and expectations for graduate school

enrollment; occupational status and personal development of African American women; and positive academic and social self-concepts, and self-esteem among African American students (Pascarella & Terenzini, 2005). African American educators have debated on the type of education appropriate for African Americans for many years. As long as research studies support the positive influence of HBCUs on the development and education of African Americans, HBCUs will continue to educate African Americans. Therefore, the African American community may not support Frederick Douglass's proposal not to have separate institutions for African Americans. On the other hand, Du Bois believed that separate educational institutions are required for African Americans. However, the African American community will also not support Du Bois's vision of only 33 financially solvent black colleges instead of nearly 100 weaker institutions with imminent threat of closure (Anderson, 1988; Coaxum, 2001; and Moses, 2004). This is because as Dr. Lowe, President of Bowie State University said, nobody would like to see a repeat of the disintegration of black high schools after the end of segregation (Wilson-Mbajekwe, 2006).

The Carnegie classifications are based on institutional resources and this puts HBCUs and other small institutions at a disadvantage. Astin (1993) proposed that the classifications should be based on value added by the institutions or the educational impact on students. Coaxum (2001) recommended a classification system based on student entry characteristics, institutional characteristics, and student outcome characteristics. HBCUs admit many students who would otherwise be denied any education and transform them to compete with their counterparts at predominantly white institutions in four years. Thus, the value added by HBCUs can be higher than the value

added by non-HBCUs. Dr. Norman Francis, president of Xavier University of Louisiana, mentioned that the challenge in fund raising was to convince many corporations and some foundations about the value of HBCUs to the country (Wilson-Mbajekwe, 2006). Until researchers come up with an agreed upon methodology to measure value added by an institution, and it can be recognized that HBCUs do add a higher value to the student, HBCUs will have a tough time trying to get corporate sponsors to view their contributions to HBCUs as an investment. Therefore, it will be in the best interest of HBCUs to work on a universally acceptable value added model.

Implications

The implications of this study are most profound for HBCU faculty. HBCU faculty can use the study to compare their research output levels and teaching load with non-HBCU faculty. HBCU faculty engaged in research activities can use this information when they plan future career moves. Unionized faculty who earn less than non-unionized faculty can work with bargaining groups to get a better salary. Tenured faculty and female faculty can use the salary structure to negotiate better salaries and administrators can use the salary structure to revise the faculty pay scale. As mentioned earlier, administrators can only close 18% of the salary gap with a revised salary structure. All other adjustments have to be done to change the characteristics of faculty at the institutions. Administrators have to allow faculty to have more time for research activities. This will increase faculty publications, faculty satisfaction, and prestige of the institutions. Further, this will improve the chances of faculty to be tenured, to be promoted to the rank of Professor, as well as aiding the institution in reducing faculty turnover.

The salary difference due to institutional characteristics ranged from 34% to 54%. Endowment per student accounted for 64% of the difference in faculty salary when HBCU faculty salary was used as standard. Thus, if HBCUs have adequate endowment, interest income can be dedicated toward faculty salaries. Administrators at HBCUs can use the results of this study to lobby for more equitable government funding and in fund raising. Other agencies, such as the UNCF, that are involved in fund raising on behalf of HBCUs can also use this study in their fundraising efforts. UNCF recently provided grants to six HBCUs to increase their fund raising capabilities (Supiano, 2008). UNCF has to provide similar grants to other struggling institutions. As mentioned earlier, HBCUs have been slow to use the internet for fundraising. Many institutional advancement offices at HBCUs do not have the staff or finances to keep in touch with their alumni. The successful fundraising through the internet by the 2008 US presidential candidates is an eye opener, and HBCUs have to adapt similar methods to stay in contact with their alumni and other benefactors to increase contributions.

In 1995, African Americans contributed \$39 million to educational organizations and \$3.33 billion to religious organizations (Vital Signs, 1996). In 2006, African Americans donated \$10.905 billion including \$786 million to charities, \$127 million to educational organizations, and \$9.942 billion to churches and religious organizations (The 2007 Buying power, 2007). The ability of African Americans to donate has increased tremendously between 1995 and 2006. As mentioned earlier, African American contributions to educational organizations is just a fraction of the contributions to religious organizations. Institutional advancement staff at HBCUs have to increase

their efforts to get a bigger share of the African American donations to strengthen the endowment wealth of their institutions.

Despite improved institutional efforts, African American contributions to educational institutions is not significant. Therefore, until African American contributions to educational institutions increases significantly, HBCUs have to depend on all other sources for contributions. John Maguire, founder and chairman of Maguire Associates, an education policy and marketing firm (Dervarics, 2008) suggested, to level the playing field in endowments, the top 50 wealthiest private colleges could give one-third of their annual endowment income to institutions serving lower-income students, or Congress can give larger tax breaks for individuals contributing to institutions serving low income students. This recommendation, if pursued further, can help resource poor HBCUs. Tom Mortenson, senior scholar at the Pell Institute for the Study of Opportunity in Higher Education, also suggested that Congress can end the tax-exempt status of colleges not serving the public interest. He added, “It’s not clear to me that Harvard would put \$1 billion to better use than an HBCU” (Dervarics, 2008, p. 8). Financial stability is important for institutions to maintain accreditation, and HBCUs have been particularly vulnerable. Florida A&M University and Texas Southern University were recently placed on accreditation probation by the Southern Association of Colleges and Schools (Walker, 2008). Clearly, American higher education endowment dollars are not distributed equally or equitably, but instead are disproportionately concentrated in few institutions.

Administrators at HBCUs may have to conduct faculty satisfaction and turnover studies and review their promotion policies to analyze the lower percentage of Professors

compared to non-HBCUs. Administrators can use the salary structure in any peer analysis of faculty salaries, and also evaluate what faculty characteristics are valued by the institution and the reward for the characteristics, and recommend a faculty salary structure for their institution. However, administrators have to consider the heavier teaching load and the lack of many grant opportunities in the humanities compared to the sciences in promotion and tenure decisions while deciding on a salary structure for their institutions (Umbach, 2008).

If teaching does not raise salaries and research output is rewarded to enhance the prestige of the institution, then the reward system is not consistent with emphasis on teaching and research. Research and teaching may be complementary for some faculty. If only research is rewarded then faculty have no incentive to teach more than the minimum number of classes required by the institution (Melguizo & Strober, 2007).

Limitations and Recommendations for further research

This study used the National Study of Postsecondary Faculty 2004 data set to explore the reasons for differences in faculty salaries at HBCUs and non-HBCUs. Institutions are coded by the Carnegie classification in the survey and there is no code for HBCUs. In this study, HBCU institutions were identified by selecting institutions with Black, non-Hispanic student enrollment higher than 50%, and also by matching institution ID in the restricted dataset with HBCUs in the Integrated Postsecondary Education Data System. The process of selecting HBCUs can be simplified if future administrations of the NSOPF survey can include HBCUs as one of the categories in the classification of institutions.

This study did not conduct any multi-level analysis. Therefore, a future study can do a multi-level analysis to identify differences by gender and rank, or ethnicity and rank. Think tanks involved with issues on African American education like the Frederick Patterson Research Institute and Thurgood Marshall College Fund can be involved in such future studies. A similar analysis as done in this study is recommended with the NSOPF 1999 dataset or the next version of the NSOPF dataset for a longitudinal analysis to explore the differences in faculty characteristics, as well as the evolving faculty salary structure at HBCUs and non-HBCUs.

Faculty at HBCUs and many small non-HBCUs may teach extra classes as overloads for additional pay. This creates two problems. Even if overload courses are classes faculty members teach regularly and they may not need extra time for class preparation, faculty may still require extra time for other associated instruction activities like grading. Thus, the percentage of time allocated for instruction and research may actually exceed 100% and may not be 100% as required by the NSOPF survey. To eliminate this situation, instead of using the percentage of time spent on undergraduate and graduate instruction, the actual student credit hours taught can be used as a proxy for teaching load. This will reflect the teaching workload better by including the number of students in a class. Further, the extra pay may not be added to the basic salary from the institution, and it will appear as if the faculty are underpaid even when they are being compensated for the extra work. The 9 month equated salary can be used to remove the effect of the contract length (9/10 month, 11/12 month). The CPI index can be used to correct for the regional effects on salary. Student evaluations are used extensively at all

institutions in promotion and tenure decisions. Therefore, the NSOPF can include a proxy for student evaluation to study how or if student evaluations affect faculty salaries.

Part time faculty have been left out of this study. A further study can include part time faculty to see the value of teaching by part time faculty and how their salaries are affected by institutional policies. Faculty at private HBCUs have lower salaries, lower tenure rates, and higher turnover rates than their counterparts at public HBCUs. A future study can explore the reasons for these differences related to institutional control. In this study, unionized HBCU faculty earned less than non unionized HBCU faculty. It was speculated earlier that unionized faculty may have bargained for higher benefits rather than higher salaries. However, a future study can verify this claim. This study explained the variance in individual faculty salary at HBCUs and non-HBCUs after controlling for personal and institutional characteristics. A future study can partition the variance to within institutions and between institutions. Just as HBCU faculty earn lower salaries than non-HBCU faculty, staff at HBCUs also earn lower salaries than staff at non-HBCUs. It may be interesting to explore the reasons for this difference.

Faculty salaries depend on many variables. This study and other salary studies can include only factors that can be measured. Some other factors can be important but cannot be measured. All faculty salary studies do not consider the negotiating skills that are important to start an academic career at a higher salary. This raises interesting questions regarding gender differences. HBCUs have to conduct faculty salary, satisfaction and retention studies on an annual basis to revise their faculty salary schedule. There are many misconceptions about HBCUs and low faculty salaries is one of them. This is because only negative news about HBCUs get the attention of the media,

and many positive developments at HBCUs are neglected by the media. The results of this study show that HBCUs do not necessarily underpay their faculty, and the differences are mainly due to market forces. Charitable contributions directed toward HBCU endowments could address some of these issues that only money can buy. If HBCUs have better endowment wealth, they can offer a variety of programs and help educate many first generation college students.

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Historically Black Colleges & Universities

<u>University/Date founded</u>	<u>City</u>	<u>Control/Affiliation</u>	<u>Carnegie classification</u>
<u>ALABAMA</u>			
1. Alabama A&M University (1875)	Normal	Public	Doctoral - Intensive
2. Alabama State University (1867)	Montgomery	Public	Masters I
3. Bishop State Community College (1927)	Mobile	Public	Associates
4. Concordia College (1922)	Selma	Private	Baccalaureate/Associates
		Lutheran Church – Missouri Synod	
5. Gadsden State Community College (1925)	Gadsden	Public	Associates
6. J.F. Drake Technical College (1961)	Huntsville	Public	Associates
7. Lawson State Community College (1965)	Birmingham	Public	Associates
8. Miles College (1905)	Birmingham	Private	Baccalaureate – General
		Christian Methodist Episcopal	
9. Oakwood University (1896)	Huntsville	Private	Baccalaureate – General
		Seventh Day Adventist	

<u>University/Date founded</u>	<u>City</u>	<u>Control/Affiliation</u>	<u>Carnegie classification</u>
10. Selma University (1878)	Selma	Private, Baptist	
11. Shelton State Community College (1965)	Tuscaloosa	Public	Associates
12. Stillman College (1876)	Tuscaloosa	Private	Baccalaureate – General
		Presbyterian Church (USA)	
13. Talladega College (1867)	Talladega	Private	Baccalaureate – Liberal Arts
		United Church of Christ	
14. Trenholm State Technical College (1963)	Montgomery	Public	Associates
15. Tuskegee University (1881)	Tuskegee	Private	Masters I
<u>ARKANSAS</u>			
16. Arkansas Baptist College (1884)	Little Rock	Private, Baptist	Baccalaureate – Liberal Arts
17. Philander Smith College (1887)	Little Rock	Private	Baccalaureate – General
		United Methodist	
18. University of Arkansas at Pine Bluff (1873)	Pine Bluff	Public	Baccalaureate – General

<u>University/Date founded</u>	<u>City</u>	<u>Control/Affiliation</u>	<u>Carnegie classification</u>
<u>DELAWARE</u>			
19. Delaware State University (1891)	Dover	Public	Masters I
<u>DISTRICT OF COLUMBIA</u>			
20. Howard University (1867)	Washington, D.C.	Private	Doctoral - Extensive
21. University of the District of Columbia (1851)	Washington, D.C.	Public	Masters I
<u>FLORIDA</u>			
22. Bethune-Cookman College (1904)	Daytona Beach	Private United Methodist	Baccalaureate – General
23. Edward Walters College (1866)	Jacksonville	Private African Methodist Episcopal	Baccalaureate – General
24. Florida A& M University (1877)	Tallahassee	Public	Masters I
25. Florida Memorial University (1879)	Miami	Private, Baptist	Baccalaureate – General
<u>GEORGIA</u>			
26. Albany State University (1903)	Albany	Public	Masters I

<u>University/Date founded</u>	<u>City</u>	<u>Control/Affiliation</u>	<u>Carnegie classification</u>
27. Clark Atlanta University (1988)	Atlanta	Private	Doctoral - Intensive
28. Fort Valley State University (1895)	Fort Valley	Public	Masters I
29. Interdenominational Theological Center (1958)	Atlanta	Private	Theological seminaries
		Interdenominational	
30. Morehouse College (1867)	Atlanta	Private	Baccalaureate – Liberal Arts
31. Morehouse School of Medicine (1975)	Atlanta	Private	Medical schools
32. Morris Brown College (1881)	Atlanta	Private	
		African Methodist Episcopal	
33. Paine College (1882)	Augusta	Private	Baccalaureate – Liberal Arts
		United Methodist	
34. Savannah State University (1890)	Savannah	Public	Masters II
35. Spelman College (1881)	Atlanta	Private	Baccalaureate – Liberal Arts
<u>KENTUCKY</u>			
36. Kentucky State University (1886)	Frankfort	Public	Masters II

<u>University/Date founded</u>	<u>City</u>	<u>Control/Affiliation</u>	<u>Carnegie classification</u>
<u>LOUISIANA</u>			
37. Dillard University (1869)	New Orleans	Private United Methodist	Baccalaureate – General
38. Grambling State University (1901)	Grambling	Public	Masters I
39. Southern University A&M College (1880)	Baton Rouge	Public	Masters I
40. Southern University at New Orleans (1959)	New Orleans	Public	Masters II
41. Southern University at Shreveport (1964)	Shreveport	Public	Associates
42. Xavier University of Louisiana (1915)	New Orleans	Private Roman Catholic	Masters I
<u>MARYLAND</u>			
43. Bowie State University (1865)	Bowie	Public	Masters I
44. Coppin State College (1900)	Baltimore	Public	Masters I
45. Morgan State University (1867)	Baltimore	Public	Masters I

<u>University/Date founded</u>	<u>City</u>	<u>Control/Affiliation</u>	<u>Carnegie classification</u>
46. University of Maryland - Eastern Shore (1886)	Princess Anne	Public	Masters I
<u>MICHIGAN</u>			
47. Lewis College of Business (1874)	Detroit	Private	Associates
<u>MISSISSIPPI</u>			
48. Alcorn State University (1871)	Lorman	Public	Masters I
49. Coahoma Community College (1949)	Clarksdale	Private	Associates
50. Hinds Community College (1954)	Utica	Public	Associates
51. Jackson State University (1877)	Jackson	Public	Doctoral – Intensive
52. Mississippi Valley State University (1946)	Itta Bena	Public	Baccalaureate – General
53. Rust College (1866)	Holly Springs	Private	Baccalaureate – General
		United Methodist	
54. Tougaloo College (1869)	Tougaloo	Private	Baccalaureate – Liberal Arts
		United Church of Christ	

<u>University/Date founded</u>	<u>City</u>	<u>Control/Affiliation</u>	<u>Carnegie classification</u>
<u>MISSOURI</u>			
55. Harris-Stowe State University (1857)	St. Louis	Public	Teachers College
56. Lincoln University (1866)	Jefferson City	Public	Masters I
<u>NORTH CAROLINA</u>			
57. Bennett College (1873)	Greensboro	Private United Methodist	Baccalaureate – Liberal Arts
58. Elizabeth City State University (1891)	Elizabeth City	Public	Baccalaureate – General
59. Fayetteville State University (1877)	Fayetteville	Public	Masters I
60. Johnson C. Smith University (1867)	Charlotte	Private	Baccalaureate – General
61. Livingston College (1879)	Salisbury	Private African Methodist Episcopal Zion Church	Baccalaureate – General
62. North Carolina A&T State University (1891)	Greensboro	Public	Masters I
63. North Carolina Central University (1910)	Durham	Public	Masters I

<u>University/Date founded</u>	<u>City</u>	<u>Control/Affiliation</u>	<u>Carnegie classification</u>
64. Saint Augustine's College (1867)	Raleigh	Private Protestant Episcopal	Baccalaureate – Liberal Arts
65. Shaw University (1865)	Raleigh	Private, Baptist	Baccalaureate – General
66. Winston-Salem State University (1862)	Winston-Salem	Public	Baccalaureate – General
<u>OHIO</u>			
67. Central State University (1887)	Wilberforce	Public	Baccalaureate – General
68. Wilberforce University (1856)	Wilberforce	Private African Methodist Episcopal	Baccalaureate – General
<u>OKLAHOMA</u>			
69. Langston University (1897)	Langston	Public	Baccalaureate – General
<u>PENNSYLVANIA</u>			
70. Cheyney University of Pennsylvania (1837)	Cheyney	Public	Masters I
71. Lincoln University (1854)	Lincoln	Public	Masters I

<u>University/Date founded</u>	<u>City</u>	<u>Control/Affiliation</u>	<u>Carnegie classification</u>
<u>SOUTH CAROLINA</u>			
72. Allen University (1870)	Columbia	Private African Methodist Episcopal	Baccalaureate – General
73. Benedict College (1870)	Columbia	Private, Baptist	Baccalaureate – General
74. Claflin University (1869)	Orangeburg	Private United Methodist	Baccalaureate – General
75. Clinton Junior College (1894)	Rock Hill	Private African Methodist Episcopal Zion Church	
76. Denmark Technical College (1948)	Denmark	Public	Associates
77. Morris College (1908)	Sumter	Private	Baccalaureate – General
78. South Carolina State University (1896)	Orangeburg	Public	Doctoral – Intensive
79. Voorhees College (1897)	Denmark	Private Protestant Episcopal	Baccalaureate – General

<u>University/Date founded</u>	<u>City</u>	<u>Control/Affiliation</u>	<u>Carnegie classification</u>
<u>TENNESSEE</u>			
80. Fisk University (1867)	Nashville	Private	Baccalaureate – Liberal Arts
81. Knoxville College (1875)	Knoxvi	Private, Presbyterian	
82. Lane College (1882)	Jackson	Private	Baccalaureate – Liberal Arts
83. Lemoyne-Owen College (1862)	Memphis	Private	Baccalaureate – General Multiple Protestant Denomination
84. Meharry Medical College (1876)	Nashville	Private United Methodist	Medical schools
85. Tennessee State University (1912)	Nashville	Public	Doctoral – Intensive
<u>TEXAS</u>			
86. Huston-Tillotson University (1876)	Austin	Private	Baccalaureate – General Multiple Protestant Denomination
87. Jarvis Cristian College (1912)	Hawkins	Private	Baccalaureate – General Christian Church (Disciples of Christ)

<u>University/Date founded</u>	<u>City</u>	<u>Control/Affiliation</u>	<u>Carnegie classification</u>
88. Paul Quinn College (1872)	Dallas	Private	Baccalaureate – General African Methodist Episcopal
89. Prairie View A&M University (1896)	Prairie View	Public	Masters I
90. St. Phillip’s College (1927)	San Antonio	Public	Associates
91. Southwestern Christian College (1949)	Terrell	Private	Theological seminaries
92. Texas College (1894)	Tyler	Private	Baccalaureate – General Christian Methodist Episcopal
93. Texas Southern University (1947)	Houston	Public	Doctoral – Intensive
94. Wiley College (1873)	Marshall	Private	Baccalaureate – General United Methodist
<u>VIRGINIA</u>			
95. Hampton University (1868)	Hampton	Private	Masters I
96. Norfolk State University (1935)	Norfolk	Public	Masters I
97. Saint Paul’s College (1888)	Lawrenceville	Private	Baccalaureate – General Protestant Episcopal

<u>University/Date founded</u>	<u>City</u>	<u>Control/Affiliation</u>	<u>Carnegie classification</u>
98. Virginia State University (1882)	Petersburg	Public	Masters I
99. Virginia Union University (1865)	Richmond	Private, Baptist	Baccalaureate – Liberal Arts
100. Virginia University of Lynchburg (1886)	Lynchburg	Private, Baptist	
<u>WEST VIRGINIA</u>			
101. Bluefield State College (1895)	Bluefield	Public	Baccalaureate – General
102. West Virginia State University (1891)	Institute	Public	Baccalaureate – General
<u>U.S. VIRGIN ISLANDS</u>			
103. University of the Virgin Islands (1962)	Charlotte Amalie	Public	Masters

APPENDIX II

Variables in the study

Variable Label	Variable Name	Description
Dependent Variable		
Log Salary	Natural logarithm of Q66A	Logarithm of Amount of income from basic salary from institution
Independent Variables		
Demographic Variables		
Gender	Q71	Male, Female
Ethnicity	X03Q74	American Indian/Alaskan Native, Asian/Pacific Islander, Black/African American non-Hispanic, Hispanic White or Hispanic Black, White non Hispanic
Citizenship status	Q81	Not US citizen, US citizen
Age		Age in 2004
Education variables		
Highest degree	X01Q17	Doctorate, First-Professional, Master's, Bachelor's, Associates, Less than an associate's degree
Highest degree, years since receiving	X09Q17	
Highest degree, years since receiving, squared		Square of X09Q17
Highest degree granting institution, 1994 Carnegie I/II	X19Q17	Research I, Research II, Other institutions
Employment variables		
Faculty status	Q3	No faculty status, Had faculty status
Employment status	Q5	Full time, Part time

Principal activity	X01Q4	Teaching, Research, Administration, Other
Years held current job	X01Q9	Years held current job
Years held current job, squared		Square of X01Q9
Rank	Q10	Not applicable, Professor, Associate Professor, Assistant Professor, Instructor, Lecturer, Other title
Years since rank achieved	X03Q10	Years since rank achieved
Years since rank achieved, squared		Square of X03Q10
Union status	Q14	Not union member, union member
Tenure status	X01Q12	Tenured, Not tenured
Type of contract, length of unit	Q67	9- or 10- month contract, 11- or 12- month contract, Other
Years since began first faculty or instructional staff job	X02Q23	Years since began first faculty or instructional staff job
Years since began first faculty or instructional staff job, squared		Square of X02Q23
Teaching or research field	X06Q16	No teaching or research field, Agriculture and home economics, Business, Education, Engineering, Fine arts, Health sciences, Humanities, Natural sciences, Social sciences, All other programs
Productivity variables		
Percent time spent on instruction, undergraduate	Q32A	Percent time spent on instruction, undergraduate
Percent time spent on instruction, graduate/first-professional	Q32 B	Percent time spent on instruction, graduate/first-professional
Scholarly activity, any funded	Q55	Not funded, Funded
Percent time spent on research activities	Q32C	Percent time spent on research activities
Career articles, refereed	Q52AA	Career articles, refereed

journals		journals
Career articles, non refereed journals	Q52AB	Career articles, non refereed journals
Career book reviews, chapters, creative works	Q52AC	Career book reviews, chapters, creative works
Career books, textbooks, reports	Q52AD	Career books, textbooks, reports
Career presentations	Q52AE	Career presentations
Career exhibitions, performances	Q52AF	Career exhibitions, performances
Career patents, computer software	Q52AG	Career patents, computer software
Recent articles, refereed journals	Q52BA	Recent articles, refereed journals
Recent articles, non refereed journals	Q52BB	Recent articles, non refereed journals
Recent book reviews, chapters, creative works	Q52BC	Recent book reviews, chapters, creative works
Recent books, textbooks, reports	Q52BD	Recent books, textbooks, reports
Recent presentations	Q52BE	Recent presentations
Recent exhibitions, performances	Q52BF	Recent exhibitions, performances
Recent patents, computer software	Q52BG	Recent patents, computer software
Institution variables		
Region where institution located	X37Q0	New England, Mid East, Great Lakes, Plains, Southeast, Southwest, Rocky Mountains, Far West
Institution control	X101Q0	Public, Private not-for-profit
Total enrollment	X23Q0	Total enrollment
Endowment assets	Merged from IPEDS	Endowment assets
Endowment/student	Endowment assets/X23Q0	Endowment/student
Percentage of students receiving any financial aid	Merged from IPEDS	Percentage of students receiving any financial aid
Percentage of students receiving institutional grant aid	Merged from IPEDS	Percentage of students receiving institutional grant aid
Average amount of institutional grant aid	Merged from IPEDS	Average amount of institutional grant aid

Total assets	Merged from IPEDS	Total assets of the institution
Total liability	Merged from IPEDS	Total liability of the institution
Debt ratio	Total liability/Total assets	Total liability/Total assets

APPENDIX III

Dummy coding of variables

Variable	Description
Log Salary	Natural log of Amount of income from basic salary from institution
<u>Highest degree</u>	
First Professional degree	A dummy variable indicating First Professional degree (1=yes, 0= no)
Masters degree	A dummy variable indicating Masters degree (1=yes, 0= no)
Doctorate degree is the reference category	
<u>Highest degree granting institution</u>	
Research II institution	A dummy variable indicating Research II institution (1=yes, 0= no)
Other institutions	A dummy variable indicating other institutions (1=yes, 0= no)
Research I institution is the reference category	
Highest degree, years since receiving	A continuous variable measuring years since receiving highest degree
Quadratic term	A quadratic term of years since receiving highest degree
Years since began first faculty or instructional staff job	A continuous variable measuring Years since began first faculty or instructional staff job
Quadratic term	A quadratic term of years since began first faculty or instructional staff job
First postsecondary job	A dummy variable indicating first postsecondary job (1=yes, 0= no)

Variable	Description
<u>Principal activity</u>	
Research	A dummy variable indicating research as principal activity (1=yes, 0= no)
Administration	A dummy variable indicating administration as principal activity (1=yes, 0= no)
Teaching is the reference category	
Years held current job	A continuous variable measuring years held current job
Quadratic term	A quadratic term of Years held current job
<u>Rank</u>	
Professor	A dummy variable indicating Professor (1=yes, 0=no)
Assistant Professor	A dummy variable indicating Assistant Professor (1=yes, 0=no)
Associate Professor is the reference category	
Years since rank achieved	A continuous variable measuring years since rank achieved
Quadratic term	A quadratic term of Years since rank achieved
<u>Union status</u>	
Union member	A dummy variable indicating union member (1=yes, 0=no)
Not an union member is the reference category	
<u>Tenure status</u>	
On tenure track	A dummy variable indicating On tenure track (1=yes, 0=no)
Not on tenure track	A dummy variable indicating Not on tenure track (1=yes, 0=no)
Not tenured/No tenure system	A dummy variable indicating Not tenured/No tenure (1=yes, 0=no)
Tenured	Tenured is the reference category

Variable	Description
<u>Type of contract</u>	
11/12 month contract	A dummy variable indicating 11/12 month contract (1=yes; 0= no)
9 or 10 month contract is the reference category	
<u>Principal field of teaching</u>	
Agriculture & Home economics	A dummy variable indicating Agriculture & Home economics (1=yes; 0= no)
Business	A dummy variable indicating Business (1=yes; 0= no)
Education	A dummy variable indicating Education (1=yes; 0= no)
Engineering	A dummy variable indicating Engineering (1=yes; 0= no)
Fine Arts	A dummy variable indicating Fine Arts (1=yes; 0= no)
Health Science	A dummy variable indicating Health Science (1=yes; 0= no)
Humanities	A dummy variable indicating Humanities (1=yes; 0= no)
Social Sciences	A dummy variable indicating Social Sciences (1=yes; 0= no)
All other disciplines	A dummy variable indicating All other disciplines (1=yes; 0= no)
Natural Sciences is the reference category	
<u>Gender</u>	
Female	A dummy variable indicating Female (1=yes, 0=no)
Male is the reference category	
<u>Ethnicity</u>	
American Indian/Alaskan native	A dummy variable indicating American Indian/Alaskan native (1=yes, 0= no)
Asian/Pacific Islander	A dummy variable indicating Asian/Pacific Islander (1=yes, 0= no)
Hispanic	A dummy variable indicating Hispanic (1=yes, 0= no)
White	A dummy variable indicating White (1=yes, 0= no)
Black/African American is the reference category	

Variable	Description
<u>Citizenship status</u>	
Not US citizen	A dummy variable indicating Not US citizen (1=yes, 0=no)
US citizen is the reference category	
Age	A continuous variable measuring age as of 2004
Quadratic term	A quadratic term of Age
<u>Productivity</u>	
Percent time spent on undergraduate education	A continuous variable measuring percent time spent on undergraduate education
Percent time spent on graduate education	A continuous variable measuring percent time spent on graduate education
Percent time spent on research Activities	A continuous variable measuring percent time spent research activities
<u>Funded scholarly activity</u>	
Scholarly activity, any funded	A dummy variable indicating scholarly activity funded (1=yes; 0=no)
Scholarly activity not funded is the reference category	
Career articles- refereed journals	A discrete variable measuring career articles in refereed journals
Career articles-non refereed journals	A discrete variable measuring career articles in Non refereed journals
Career book reviews/chapters/ creative works	A discrete variable measuring career book reviews/chapters/ creative works
Career books/textbooks/reports	A discrete variable measuring career books/textbooks/reports
Career presentations	A discrete variable measuring career Presentations

Variable	Description
Career exhibitions/performances	A discrete variable measuring career exhibitions/performances
Career patents/computer software	A discrete variable measuring career patents/computer software
Recent articles refereed journals	A discrete variable measuring recent articles in refereed journals
Recent articles non refereed journals	A discrete variable measuring recent articles in non refereed journals
Recent book reviews/chapters/creative works	A discrete variable measuring recent book reviews/chapters/ creative works
Recent books/textbooks/reports	A discrete variable measuring recent books/textbooks/reports
Recent presentations	A discrete variable measuring recent presentations
Recent exhibitions/performances	A discrete variable measuring recent exhibitions/performances
Recent patents/computer software	A discrete variable measuring recent patents/computer software
<u>Carnegie classification</u>	
Doctoral institution	A dummy variable indicating doctoral institution (1=yes; 0= no)
Baccalaureate institution	A dummy variable indicating baccalaureate institution (1=yes; 0= no)
<u>Region</u>	
Southeast	A dummy variable indicating Southeast (1=yes; 0= no)
Great Lakes	A dummy variable indicating Great Lakes (1=yes; 0= no)
Southwest	A dummy variable indicating Southwest (1=yes; 0= no)
New England	A dummy variable indicating New England (1=yes; 0= no)

Variable	Description
Plains	A dummy variable indicating Plains (1=yes; 0= no)
Rocky Mountains	A dummy variable indicating Rocky Mountains (1=yes; 0= no)
Far West	A dummy variable indicating Far West (1=yes; 0= no)
Mid East is the reference category	
<u>Institution control</u>	
Public	A dummy variable indicating public institution (1=yes; 0= no)
Private not-for-profit is the reference category	
Endowment per student	Ratio of endowment to student enrollment
Percentage of students receiving any financial aid	A continuous variable measuring percentage of students receiving any financial aid
Percentage of students receiving institutional grant aid	A continuous variable measuring percentage of students receiving institutional grant aid
Average amount of institutional grant aid	A continuous variable measuring average amount of institutional grant aid
Debt ratio	Ratio of total assets to total liabilities

APPENDIX 1V

Descriptive Statistics – HBCU faculty

Variable	Mean	Adjusted Standard Error
Amount of income from basic salary from institution (\$)	62,981.980	282.763
Log salary	10.992	0.004
<u>Education variables</u>		
Highest degree – Doctorate	0.856	0.004
Highest degree – First professional	0.020	0.002
Highest degree – Masters	0.124	0.004
Highest degree – Research I institution	0.519	0.006
Highest degree – Research II institution	0.107	0.004
Highest degree – Other institutions	0.294	0.006
Years since receiving highest degree	17.381	0.119
<u>Employment variables</u>		
First postsecondary job	0.369	0.006
Not first postsecondary job	0.631	0.006
Principal activity – Teaching	0.827	0.005
Principal activity – Research	0.031	0.002
Principal activity – Administration	0.142	0.004
Years held current job	13.289	0.133
Professor	0.255	0.005
Associate Professor	0.433	0.006
Assistant Professor	0.312	0.006
Union member	0.254	0.005
Not Union member	0.746	0.005
Tenured	0.560	0.006
On tenure track	0.334	0.006
Not on tenure track	0.076	0.003
Not tenured/No tenure system	0.030	0.002
9- or 10- month contract	0.774	0.005
11- or 12- month contract	0.226	0.005
Years since began first faculty or instructional staff job	19.313	0.138
Agriculture & Home economics	0.023	0.002
Business	0.082	0.003
Education	0.065	0.003

Variable	Mean	Adjusted Standard Error
Engineering	0.092	0.004
Fine arts	0.048	0.003
Health sciences	0.054	0.003
Humanities	0.118	0.004
Natural sciences	0.258	0.005
Social sciences	0.111	0.004
Other programs	0.149	0.004
<u>Demographic variables</u>		
Male	0.645	0.006
Female	0.355	0.006
Black/African American	0.600	0.006
White	0.232	0.005
Asian/Pacific Islander	0.153	0.004
American Indian/Alaskan Native	0.012	0.001
Hispanic	0.003	0.0006
US citizen	0.863	0.004
Not US citizen	0.137	0.004
Age in 2004 (Years)	53.282	0.114
<u>Productivity variables</u>		
Percent time spent on undergraduate instruction	48.488	0.373
Percent time spent on graduate/first-professional instruction	14.576	0.246
Percent time spent on research activities	18.669	0.192
Scholarly activity funded	0.422	0.006
Scholarly activity not funded	0.578	0.006
Career articles – referred journals	10.739	0.197
Career articles – non referred journals	7.573	0.169
Career book reviews/chapters/creative works	2.731	0.094
Career books/text books/reports	3.064	0.086
Career presentations	24.574	0.395
Career exhibitions/performances	8.166	0.614
Career patents/computer software	0.257	0.015
Recent articles – referred journals	1.612	0.029
Recent articles – non referred journals	1.353	0.035
Recent book reviews/chapters/creative works	0.563	0.014
Recent books/text books/reports	0.732	0.020
Recent presentations	3.946	0.062
Recent exhibitions/performances	0.741	0.053

Variable	Mean	Adjusted Standard Error
Recent patents/computer software	0.085	0.006
<u>Institution variables</u>		
Carnegie – doctoral institution	0.227	0.005
Carnegie- masters institution	0.508	0.006
Carnegie- baccalaureate institution	0.265	0.005
Public institution	0.705	0.006
Private not-for-profit institution	0.295	0.006
Mid East	0.508	0.006
Southeast	0.369	0.006
Great Lakes	0.063	0.003
Southwest	0.060	0.003
New England	0.000	----
Plains	0.000	----
Rocky Mountains	0.000	----
Far West	0.000	----
Percent students receiving any financial aid	83.922	0.192
Average amount of institutional grant aid (\$)	3877.309	32.568
Endowment per student (\$)	7173.936	214.381
Debt ratio (Liabilities/Assets)	0.351	0.003

APPENDIX V

Descriptive Statistics – non-HBCU

Variable	Mean	Adjusted Standard Error
Amount of income from basic salary from institution (\$)	73,705.32	78.078
Log salary	11.114	0.0009
<u>Education variables</u>		
Highest degree – Doctorate	0.846	0.0008
Highest degree – First professional	0.055	0.0005
Highest degree – Masters	0.099	0.0007
Highest degree – Research I institution	0.651	0.001
Highest degree – Research II institution	0.101	0.0007
Highest degree – Other institutions	0.177	0.0009
Years since receiving highest degree	17.818	0.025
<u>Employment variables</u>		
First postsecondary job	0.425	0.001
Not first postsecondary job	0.575	0.001
Principal activity – Teaching	0.679	0.001
Principal activity – Research	0.210	0.0009
Principal activity – Administration	0.111	0.0007
Years held current job	12.859	0.023
Professor	0.392	0.001
Associate Professor	0.290	0.001
Assistant Professor	0.318	0.001
Union member	0.183	0.0009
Not Union member	0.817	0.009
Tenured	0.608	0.001
On tenure track	0.272	0.001
Not on tenure track	0.095	0.0007
Not tenured/No tenure system	0.025	0.0004
9- or 10- month contract	0.666	0.001
11- or 12- month contract	0.334	0.001
Years since began first faculty or instructional staff job	16.681	0.026
Agriculture & Home economics	0.023	0.0003
Business	0.073	0.0006

Variable	Mean	Adjusted Standard Error
Education	0.070	0.0006
Engineering	0.061	0.0005
Fine arts	0.064	0.0006
Health sciences	0.099	0.0007
Humanities	0.139	0.0008
Natural sciences	0.251	0.0009
Social sciences	0.130	0.0008
Other programs	0.090	0.0006
<u>Demographic variables</u>		
Male	0.683	0.001
Female	0.317	0.001
Black/African American	0.037	0.0004
White	0.824	0.0009
Asian/Pacific Islander	0.101	0.0007
American Indian/Alaskan Native	0.009	0.0002
Hispanic	0.029	0.0004
US citizen	0.898	0.0007
Not US citizen	0.102	0.0007
Age in 2004 (Years)	50.267	0.023
<u>Productivity variables</u>		
Percent time spent on undergraduate instruction	38.209	0.069
Percent time spent on graduate/first-professional instruction	18.205	0.046
Percent time spent on research activities	25.619	0.050
Scholarly activity funded	0.438	0.001
Scholarly activity not funded	0.562	0.001
Career articles – referred journals	23.632	0.082
Career articles – non referred journals	10.169	0.053
Career book reviews/chapters/creative works	5.616	0.025
Career books/text books/reports	3.056	0.018
Career presentations	43.129	0.142
Career exhibitions/performances	9.554	0.120
Career patents/computer software	0.463	0.004
Recent articles – referred journals	3.126	0.010
Recent articles – non referred journals	1.327	0.007
Recent book reviews/chapters/creative works	1.013	0.004
Recent books/text books/reports	0.535	0.003
Recent presentations	5.157	0.014

Variable	Mean	Adjusted Standard Error
Recent exhibitions/performances	0.938	0.012
Recent patents/computer software	0.122	0.001
<u>Institution variables</u>		
Carnegie – doctoral institution	0.612	0.001
Carnegie- masters institution	0.283	0.001
Carnegie- baccalaureate institution	0.105	0.001
Public institution	0.648	0.001
Private not-for-profit institution	0.352	0.001
Mid East	0.167	0.0008
Southeast	0.240	0.0009
Great Lakes	0.182	0.0009
Southwest	0.085	0.0006
New England	0.077	0.0006
Plains	0.086	0.0006
Rocky Mountains	0.038	0.0004
Far West	0.125	0.0007
Percent students receiving any financial aid	76.896	0.033
Average amount of institutional grant aid (\$)	6,104.061	12.543
Endowment per student (\$)	46,443.93	309.007
Debt ratio (Liabilities/Assets)	0.344	0.0004

Regression – HBCU

Variable	Coefficient	Adjusted Std. error	Adjusted t	95% Lower Confidence Interval	95% Upper Confidence Interval
Intercept	10.901	0.045	242.512*	10.813	10.989
<u>Education variables</u>					
<i>Highest degree earned</i>					
Highest degree – First professional	0.424	0.027	15.528*	0.371	0.478
Highest degree – Masters	-0.083	0.014	-5.840*	-0.111	-0.055
Highest degree – Doctorate is the reference category					
<i>Highest degree earned from institution</i>					
Highest degree institution – Research II	0.115	0.011	10.354*	0.093	0.137
Highest degree institution – Other	0.018	0.008	2.317	0.003	0.033
Highest degree institution – Research I is the reference category					
Years since receiving highest degree	0.008	0.0006	8.363*	0.004	0.006
<u>Employment variables</u>					
Years since began first faculty or Instructional job	0.005	0.0006	7.808*	0.004	0.006
<i>First postsecondary job</i>					
First postsecondary job	0.109	0.009	12.629*	0.092	0.126
Not first postsecondary job is the reference category					

Variable	Coefficient	Adjusted Std. error	Adjusted t	95% Lower Confidence Interval	95% Upper Confidence Interval
<i>Principal activity</i>					
Principal activity – Research	0.111	0.028	3.987*	0.056	0.165
Principal activity – Administration	0.064	0.014	4.695*	0.037	0.091
Principal activity – Teaching is the reference category					
Years held current job	-0.002	0.0006	-2.864	-0.003	-0.0006
<i>Rank</i>					
Professor	0.193	0.009	21.915*	0.176	0.211
Assistant Professor	-0.102	0.013	-8.145*	-0.127	-0.078
Associate Professor is the reference category					
<i>Union status</i>					
Union member	-0.058	0.011	-5.285*	-0.080	-0.037
Not an union member is the reference category					
<i>Tenure status</i>					
On tenure track	0.082	0.012	6.599*	0.058	0.107
Not on tenure track	-0.109	0.017	-6.627*	-0.143	-0.077
Not tenured/No tenure system	-0.195	0.022	-8.877*	-0.238	-0.152
Tenured is the reference category					

Variable	Coefficient	Adjusted Std. error	Adjusted t	95% Lower Confidence Interval	95% Upper Confidence Interval
<i>Contract length</i>					
11- or 12- month contract	0.087	0.010	8.578*	0.067	0.107
9- or 10- month contract is the reference category					
<i>Teaching or research field</i>					
Agriculture & Home Economics	-0.129	0.033	-3.895*	-0.194	-0.064
Business	0.229	0.012	18.664*	0.205	0.253
Education	-0.037	0.018	-2.115	-0.072	-0.003
Engineering	0.071	0.013	5.552*	0.046	0.095
Fine arts	0.055	0.023	2.444	0.011	0.099
Health sciences	0.024	0.018	1.361	-0.011	0.059
Humanities	-0.014	0.013	-1.053	-0.039	0.012
Social sciences	0.069	0.011	5.969*	0.046	0.091
Other programs	0.066	0.011	5.880*	0.044	0.088
Natural Sciences is the reference category					
<u>Demographic variables</u>					
<i>Gender</i>					
Female	-0.029	0.007	-3.990*	-0.044	0.015
Male is the reference category					

Variable	Coefficient	Adjusted Std. error	Adjusted t	95% Lower Confidence Interval	95% Upper Confidence Interval
<i>Race/Ethnicity</i>					
American Indian/Alaskan native	0.037	0.035	1.042	-0.033	0.106
Asian/Pacific Islander	0.090	0.011	7.844*	0.068	0.113
Hispanic	0.027	0.053	0.514	-0.077	0.132
White	-0.048	0.008	-5.993*	-0.063	-0.032
Black/African American is the reference category					
<i>Citizenship status</i>					
Not US citizen	-0.026	0.011	-2.442	-0.047	-0.005
US citizen is the reference category					
Age (in 2004)	-0.003	0.0006	-4.779*	-0.004	-0.002
<u>Productivity variables</u>					
Percent time spent on undergraduate instruction	-0.0020	0.0002	-10.281*	-0.0024	-0.0016
Percent time spent on graduate/first-professional instruction	-0.0019	0.0003	-7.413*	-0.0025	-0.0014
Percent time spent on research activities	-0.0060	0.0003	-18.447*	-0.0067	-0.0054
<i>Scholarly activity</i>					
Funded scholarly activity	0.059	0.007	8.059*	0.044	0.073
Scholarly activity not funded is the reference category					
Career articles – refereed journals	-0.0013	0.0003	-4.535*	-0.002	-0.0007

Variable	Coefficient	Adjusted Std. error	Adjusted t	95% Lower Confidence Interval	95% Upper Confidence Interval
Career articles – non refereed journals	0.0008	0.0004	2.375	0.0001	0.0015
Career book reviews, chapters, creative works	0.0058	0.0006	9.178*	0.0046	0.0071
Career books, text books, reports	0.0006	0.0007	0.855	-0.0008	0.002
Career presentations	0.0013	0.0002	8.461*	0.001	0.002
Career exhibitions, performances	-0.0015	0.0001	-14.579*	-0.002	-0.001
Career patents, computer software	0.005	0.005	1.016	-0.005	0.015
Recent articles – refereed journals	0.016	0.002	8.369*	0.012	0.019
Recent articles – non refereed journals	0.011	0.003	4.331*	0.006	0.016
Recent book reviews, chapters, creative works	-0.054	0.004	-12.854*	-0.062	-0.046
Recent books, text books, reports	0.014	0.003	4.172*	0.0075	0.021
Recent presentations	2.2E-05	0.001	0.023	-0.002	0.002
Recent exhibitions, performances	-0.0007	0.001	-0.642	-0.003	0.0014
Recent patents, computer software	-0.047	0.012	-4.034*	-0.071	-0.024
<u>Institution variables</u>					
<i>Carnegie classification</i>					
Carnegie doctoral institution	-0.139	0.014	-9.974*	-0.166	-0.111
Carnegie baccalaureate institution	-0.121	0.019	-6.268*	-0.159	-0.083
Carnegie masters institution is the reference category					

Variable	Coefficient	Adjusted Std. error	Adjusted t	95% Lower Confidence Interval	95% Upper Confidence Interval
<i>Region</i>					
Southeast	-0.174	0.013	-13.731*	-0.199	-0.149
Great Lakes	-0.205	0.016	-12.541*	-0.237	-0.173
Southwest	-0.125	0.015	-8.265*	-0.155	-0.096
Mid East is the reference category					
<i>Institution control</i>					
Private not-for-profit	-0.122	0.017	-7.337*	-0.155	-0.089
Public is the reference category					
<i>Financial variables</i>					
Endowment per student	2.0E-06	2.9E-07	6.839*	1.43E-06	2.58E-06
Percent with any financial aid	0.0020	0.0003	5.929*	0.0014	0.0027
Average amount of institutional aid	2.1E-05	1.8E-06	11.999*	1.8E-05	2.5E-05
Debt ratio	-0.065	0.0266	-2.435	-0.117	-0.013

* p<.001

Regression – non-HBCU

Variable	Coefficient	Adjusted Std. error	Adjusted t	95% Lower Confidence Interval	95% Upper Confidence Interval
Intercept	11.158	0.010	1081.76*	11.138	11.179
<u>Education variables</u>					
<i>Highest degree earned</i>					
Highest degree earned – First professional	0.173	0.004	41.441*	0.165	0.181
Highest degree earned – Masters	-0.034	0.003	-11.243*	-0.039	-0.028
Highest degree – Doctorate is the reference category					
<i>Highest degree earned from institution</i>					
Highest degree earned institution – Research II	-0.019	0.002	-8.130*	-0.025	-0.015
Highest degree earned institution – Other	-0.013	0.002	-6.239*	-0.017	-0.009
Highest degree institution – Research I is the reference category					
Years since receiving highest degree	0.004	0.0002	22.703*	0.0035	0.0042
<u>Employment variables</u>					
Years since began first faculty or Instructional job	0.003	0.0002	18.389*	0.0029	0.0036
<i>First postsecondary job</i>					
First postsecondary job	0.0022	0.002	1.205	-0.0014	0.0058
Not first postsecondary job is the reference category					

Variable	Coefficient	Adjusted Std. error	Adjusted t	95% Lower Confidence Interval	95% Upper Confidence Interval
<i>Principal activity</i>					
Principal activity – Research	0.034	0.003	13.215*	0.029	0.039
Principal activity – Administration	0.059	0.003	18.427*	0.052	0.065
Principal activity – Teaching is the reference category					
Years held current job	-0.001	0.0001	-9.019*	-0.0016	-0.0010
<i>Rank</i>					
Professor	0.148	0.002	70.383*	0.144	0.152
Assistant Professor	-0.087	0.003	-30.745*	-0.092	-0.081
Associate Professor is the reference category					
<i>Union status</i>					
Union member	0.013	0.002	5.943*	0.009	0.018
Not an union member is the reference category					
<i>Tenure status</i>					
On tenure track	-0.027	0.003	-9.188*	-0.033	-0.021
Not on tenure track	-0.133	0.003	-39.276*	-0.139	-0.126
Not tenured/No tenure system	-0.115	0.005	-21.227*	-0.125	-0.104
Tenured is the reference category					
<i>Contract length</i>					
11- or 12- month contract	0.078	0.002	43.915*	0.074	0.081
9- or 10- month contract is the referer					

Variable	Coefficient	Adjusted Std. error	Adjusted t	95% Lower Confidence Interval	95% Upper Confidence Interval
<i>Teaching or research field</i>					
Agriculture & Home Economics	-0.008	0.005	-1.541	-0.017	0.002
Business	0.219	0.003	70.452*	0.214	0.226
Education	-0.060	0.003	-17.776*	-0.069	-0.054
Engineering	0.097	0.003	28.884*	0.090	0.104
Fine arts	-0.113	0.004	-28.551*	-0.121	-0.106
Health sciences	0.061	0.003	17.861*	0.054	0.067
Humanities	-0.097	0.003	-36.714*	-0.103	-0.092
Social sciences	-0.028	0.003	-10.817*	-0.033	-0.023
Other programs	-0.039	0.003	-12.768*	-0.045	-0.033
Natural Sciences is the reference category					
<u>Demographic variables</u>					
<i>Gender</i>					
Female	-0.044	0.002	-25.922*	-0.047	-0.041
Male is the reference category					
<i>Race/Ethnicity</i>					
American Indian/Alaskan native	-0.053	0.008	-6.418*	-0.0698	-0.037
Asian/Pacific Islander	-0.015	0.005	-3.254	-0.024	-0.006
Hispanic	-0.029	0.006	-5.232*	-0.041	-0.019
White	-0.019	0.004	-4.804*	-0.026	-0.011
Black/African American is the reference category					

Variable	Coefficient	Adjusted Std. error	Adjusted t	95% Lower Confidence Interval	95% Upper Confidence Interval
<i>Citizenship status</i>					
Not US citizen	-0.007	0.003	-2.584	-0.012	-0.002
US citizen is the reference category					
Age (in 2004)	-0.0006	0.0001	-4.076*	-0.0009	-0.0003
<u>Productivity variables</u>					
Percent time spent on undergraduate instruction	-0.0028	5.5E-05	-50.367*	-0.0029	-0.0027
Percent time spent on graduate/first-professional instruction	-0.0009	6.2E-05	-13.672*	-0.0009	-0.0007
Percent time spent on research activities	-0.0008	6.4E-05	-11.767*	-0.0009	-0.0006
<i>Scholarly activity</i>					
Funded scholarly activity	0.041	0.002	25.032*	0.038	0.045
Scholarly activity not funded is the reference category					
Career articles – refereed journals	0.0009	3.7E-05	23.224*	0.0008	0.0009
Career articles – non refereed journals	-0.0004	4.4E-05	-9.541*	-0.0005	-0.0003
Career book reviews, chapters, creative works	0.003	9.7E-05	26.472*	0.0024	0.0028
Career books, text books, reports	-0.001	0.0001	-11.622*	-0.0016	-0.0012
Career presentations	8.2E-05	1.9E-05	4.333*	4.5E-05	0.0001
Career exhibitions, performances	4.9E-05	2.3E-05	2.106	3.4E-06	9.4E-05
Career patents, computer software	0.007	0.0006	11.496*	0.006	0.008
Recent articles – refereed journals	0.0001	0.0003	0.439	-0.0004	0.0007
Recent articles – non refereed journals	0.003	0.0003	7.382*	0.002	0.003

Variable	Coefficient	Adjusted Std. error	Adjusted t	95% Lower Confidence Interval	95% Upper Confidence Interval
Recent book reviews, chapters, creative works	-0.009	0.0005	-16.416*	-0.009	-0.007
Recent books, text books, reports	0.009	0.0007	14.241*	0.009	0.011
Recent presentations	0.002	0.0002	11.207*	0.0016	0.0022
Recent exhibitions, performances	-0.0008	0.0002	-3.560*	-0.001	-0.0004
Recent patents, computer software	0.015	0.002	-8.459*	-0.018	-0.011
<u>Institution variables</u>					
<i>Carnegie classification</i>					
Carnegie doctoral institution	0.046	0.002	22.097*	0.042	0.049
Carnegie baccalaureate institution	-0.053	0.003	-19.063*	-0.058	-0.048
Carnegie masters institution is the reference category					
<i>Region</i>					
Southeast	-0.076	0.003	-28.036*	-0.082	-0.071
Great Lakes	-0.048	0.003	-17.540*	-0.053	-0.042
Southwest	-0.091	0.004	-25.809*	-0.097	-0.084
New England	-0.043	0.003	-13.468*	-0.049	-0.037
Plains	-0.087	0.003	-26.474*	-0.094	-0.081
Rocky Mountains	-0.092	0.005	-19.678*	-0.101	-0.083
Far West	-0.012	0.003	-3.841 *	-0.018	-0.006
Mid East is the reference category					

Variable	Coefficient	Adjusted Std. error	Adjusted t	95% Lower Confidence Interval	95% Upper Confidence Interval
<i>Institution control</i>					
Private not-for-profit	-0.042	0.003	-13.365*	-0.048	-0.036
Public is the reference category					
<i>Financial variables</i>					
Endowment per student	1.0E-07	7.3E-09	13.863*	8.7E-08	1.2E-07
Percent with any financial aid	-0.0008	5.9E-05	-13.913*	0.0009	-0.0007
Average amount of institutional aid	1.0E-05	3.1E-07	32.544*	9.4E-06	1.06E-05
Debt ratio	-0.059	0.005	-11.143*	-0.070	-0.049

* p<.001

Blinder-Oaxaca wage decomposition of salary differential between faculty at HBCUs and non-HBCUs

Variable	<u>Portion (Percentage) Accounted for by Difference in Means</u>				
		Non-HBCU Coefficients As Standard		HBCU Coefficients As Standard	
<u>Education variables</u>		(8.40)		(14.37)	
<i>Highest degree earned</i>		(5.70)		(13.97)	
Highest degree earned – First professional	0.0061	(5.01)		0.0149	(12.27)
Highest degree earned – Masters	0.0008	(0.69)		0.0021	(1.69)
<i>Highest degree earned from institution</i>		(1.34)		(-2.32)	
Highest degree earned institution – Research II	0.0001	(0.10)		-0.0007	(-0.61)
Highest degree earned institution – Other	0.0015	(1.24)		-0.0021	(-1.71)
Years since receiving highest degree	0.0017	(1.36)		0.0033	(2.72)
<u>Employment variables</u>		(15.18)		(31.92)	
Years since began first faculty or instructional job	-0.0085	(-6.96)		-0.0136	(-11.13)
<i>First postsecondary job</i>		(0.10)		(4.96)	
First postsecondary job	0.0001	(0.10)		0.0060	(4.96)

Variable	<u>Portion (Percentage) Accounted for by Difference in Means</u>			
	Non-HBCU Coefficients As Standard		HBCU Coefficients As Standard	
<i>Principal activity</i>		(3.54)		(14.68)
Principal activity – Research	0.0061	(5.04)	0.0199	(16.31)
Principal activity – Administration	-0.0018	(-1.50)	-0.0019	(-1.63)
Years held current job	0.0006	(0.46)	0.0008	(0.64)
<i>Rank</i>		(16.18)		(21.24)
Professor	0.0203	(16.60)	0.0265	(21.73)
Assistant Professor	-0.0005	(-0.42)	-0.0006	(-0.49)
<i>Union status</i>				
Union member	-0.0009	(-0.78)	0.0041	(3.39)
<i>Tenure status</i>		(-0.26)		(-5.11)
On tenure track	0.0017	(1.38)	-0.0051	(-4.16)
Not on tenure track	-0.0026	(-2.11)	-0.0021	(-1.75)
Not tenured/No tenure system	0.0006	(0.47)	0.0010	(0.80)
<i>Contract length</i>				
11- or 12- month contract	0.0083	(6.80)	0.0094	(7.72)
<i>Teaching or research field</i>		(-3.90)		(-4.47)

Variable	<u>Portion (Percentage) Accounted for by Difference in Means</u>			
	Non-HBCU Coefficients As Standard		HBCU Coefficients As Standard	
Agriculture & Home Economics	-3.2E-06	(-0.003)	-5.4E-05	(-0.04)
Business	-0.0020	(-1.67)	-0.002	(-1.75)
Education	-0.0003	(-0.25)	-0.0002	(-0.15)
Engineering	-0.0030	(-2.49)	-0.0022	(-1.81)
Fine arts	-0.0019	(-1.52)	0.0009	(0.74)
Health sciences	0.0027	(2.24)	0.0011	(0.90)
Humanities	-0.0020	(-1.68)	-0.0003	(-0.23)
Social sciences	-0.0005	(-0.43)	0.0013	(1.04)
Other programs	0.0023	(1.90)	-0.0039	(-3.17)
<u>Demographic variables</u>		(-5.97)		(-17.66)
<i>Gender</i>				
Female	0.0017	(1.36)	0.0011	(0.92)
<i>Race/Ethnicity</i>		(-9.01)		(-26.48)
American Indian/Alaskan native	0.0001	(0.101)	-8.5E-05	(-0.07)
Asian/Pacific Islander	0.0008	(0.63)	-0.005	(-3.87)
Hispanic	-0.0008	(-0.64)	0.0007	(0.59)
White	-0.011	(-9.10)	-0.028	(-23.12)
<i>Citizenship status</i>				
Not US citizen	0.0002	(0.20)	0.0009	(0.75)

Variable	<u>Portion (Percentage) Accounted for by Difference in Means</u>			
	Non-HBCU Coefficients As Standard		HBCU Coefficients As Standard	
Age (in 2004)	0.0018	(1.48)	0.0087	(7.15)
<u>Productivity variables</u>		(29.44)		(-6.51)
Percent time spent on undergraduate instr	0.0276	(22.58)	0.020	(16.50)
Percent time spent on graduate/first-professional instruction	-0.0031	(-2.61)	-0.0073	(-6.01)
Percent time spent on research activities <i>Scholarly activity</i>	-0.0054	(-4.40)	-0.043	(-35.05)
Funded scholarly activity	0.0007	(0.57)	0.0009	(0.81)
<i>Short and long run research output</i>		(13.30)		(17.24)
Career articles – refereed journals	0.010	(9.01)	-0.016	(-13.33)
Career articles – non refereed journals	-0.0011	(-0.90)	0.0022	(1.79)
Career book reviews, chapters, creative works	0.0074	(6.08)	0.017	(13.75)
Career books, text books, reports	1.2E-05	(0.0095)	-4.9E-06	(-0.004)
Career presentations	0.0015	(1.24)	0.0249	(20.42)
Career exhibitions, performances	6.7E-05	(0.06)	-0.0021	(-1.76)
Career patents, computer software	0.0014	(1.16)	0.001	(0.84)
Recent articles – refereed journals	0.0002	(0.15)	0.024	(19.48)
Recent articles – non refereed journals	-6.7E-05	(-0.06)	-0.0003	(-0.24)

Variable	<u>Portion (Percentage) Accounted for by Difference in Means</u>			
	Non-HBCU Coefficients As Standard		HBCU Coefficients As Standard	
Recent book reviews, chapters, creative works	-0.0038	(-3.14)	-0.024	(-19.87)
Recent books, text books, reports	-0.0019	(-1.59)	-0.0028	(-2.29)
Recent presentations	0.0024	(1.88)	2.7E-05	(0.02)
Recent exhibitions, performances	-0.0002	(-0.13)	-0.0001	(-0.11)
Recent patents, computer software	-0.0006	(-0.46)	-0.0018	(-1.46)
<u>Institution variables</u>		(34.77)		(54.34)
<i>Carnegie classification</i>		(21.33)		(-27.78)
Carnegie doctoral institution	0.0175	(14.37)	-0.0533	(-43.72)
Carnegie baccalaureate institution	0.0085	(6.96)	0.0194	(15.94)
<i>Region</i>		(-11.25)		(-4.06)
Southeast	0.0099	(8.15)	0.0226	(18.56)
Great Lakes	-0.0057	(-4.66)	-0.0245	(-20.11)
Southwest	-0.0022	(-1.81)	-0.0030	(-2.51)
New England	-0.0033	(-2.71)	0	(0)
Plains	-0.0075	(-6.14)	0	(0)
Rocky Mountains	-0.0035	(-2.85)	0	(0)
Far West	-0.0015	(-1.23)	0	(0)
<i>Institution control</i>				
Private not-for-profit	-0.0024	(-1.99)	-0.0069	(-5.71)

Variable	<u>Portion (Percentage) Accounted for by Difference in Means</u>			
	Non-HBCU Coefficients As Standard		HBCU Coefficients As Standard	
<i>Financial variables</i>		(26.67)		(91.89)
Endowment per student	0.0039	(3.24)	0.0785	(64.31)
Percent with any financial aid	0.0058	(4.78)	-0.0143	(-11.72)
Average amount of institutional aid	0.0223	(18.30)	0.0474	(38.93)
Debt ratio	0.0004	(0.35)	0.0005	(0.38)
Total difference explained	0.0998	(81.84)	0.093	(76.44)