

Student Learning in the *Principles of Economics* Course At Predominantly Black and White Universities: Lessons from Two Schools

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Abstract

While much has recently been written about the overall effectiveness of economic education in the U.S. (see Becker, 1997, e.g.), very little systematic research has been done on the economic education of African Americans at Historically Black Colleges and Universities (HBCUs). This paper takes a step toward improving the understanding of economic education at HBCUs by examining the learning outcomes of students – as measured by pre- and post-testing – in a *Principles of Macroeconomics* course from a representative HBCU and comparing them to those of students from a comparable Traditionally White College and University (TWCU). We find that while students at the HBCU start the course with a lower level of economics knowledge, by the end of the course they perform similarly to the students at the TWCU. That is, students at the HBCU exhibit more value added to their stock of economic knowledge.

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Abstract

While much has recently been written about the overall effectiveness of economic education in the U.S. (see Becker, 1997, e.g.), very little systematic research has been done on the economic education of African Americans at Historically Black Colleges and Universities (HBCUs). This paper takes a step toward improving the understanding of economic education at HBCUs by examining the learning outcomes of students – as measured by pre- and post-testing – in a *Principles of Macroeconomics* course from a representative HBCU and comparing them to those of students from a comparable Traditionally White College and University (TWCU). We find that while students at the HBCU start the course with a lower level of economics knowledge, by the end of the course they perform similarly to the students at the TWCU. That is, students at the HBCU exhibit more value added to their stock of economic knowledge.

WHAT DO WE KNOW ABOUT THE ECONOMIC EDUCATION OF AFRICAN-AMERICAN COLLEGE STUDENTS?

Despite attempts within the economics profession over the past decade to increase the representation of minority groups in economics, the low number of African-Americans majoring and seeking advanced degrees in economics is striking. As Paul Ruffins (1996, 18) notes, "there is probably no other field where the number of African-American Ph.D.s is so low, relative to the number of undergraduates who take courses in the discipline, especially in light of the number of African Americans with related professional degrees such as Master's of Business Administration or Certified Public Accountancy." The low representation of blacks in the economics profession raises public policy as well as diversity concerns. In particular, as many black economists point out, "the African-American community, as a whole, suffers when there aren't any African-American economists at the conference table when important decisions are being made." (Ruffins 1996, 18)

During the past two decades, attempts to increase the number of black economists have focused primarily on advanced undergraduate and graduate-level education.¹ Despite these efforts, the number of blacks in the economics profession remains low. Surprisingly, little attention has been paid to the effectiveness of basic undergraduate economic education for blacks, especially those attending historically black colleges and universities (HBCUs). While HBCUs account for approximately 15% of overall black enrollment in institutions of higher education in the U.S., they produce a disproportionate 28% of black graduates.² Traditionally and historically, HBCUs have played a critical role in the education of black students in the U.S. but have been a largely overlooked source of potential black economic majors and graduate students.

While much has recently been written about the overall effectiveness of undergraduate economic education in the U.S. (see Becker 1997, e.g.), very little systematic research has been done on the economic education of black college students. Consequently, we know relatively little about the learning outcomes of black undergraduate economics students (at HBCUs or elsewhere) or the effects of alternative teaching pedagogy on these students. A recent study (Walstad and Allgood, 1999) analyzing economics scores for 12,854 students who took the Major Field Test in Business II (MFTB) as college seniors shows that black students scored nearly 10 percentage points lower than their white counterparts and 6.5 (4.5) percentage points lower than Asian (Hispanic) students. These differences remain even after controlling for variation in gender, educational aspirations, enrollment status and grade-point averages. In terms of absolute performance, blacks answered only about a third of the economics questions correctly, despite having previously taken at least one principles-level course and being enrolled in university business programs.³

¹ For example, since 1974 the American Economic Association (AEA) has sponsored an annual Summer Program for Minority Students, with the aim of increasing the number of minority students who pursue Ph.D.s in economics. More recently, the AEA has also jointly sponsored (with the Federal Reserve System) a number of dissertation fellowships to promote research skills among minority Ph.D. students and provide monetary support for minority Ph.D. students completing their dissertations.

² See *Digest of Education Statistics 1998*, Tables 206, 218 and 265.

³ A recent national survey commissioned by the National Council on Economic Education (*The Standards in Economics Survey 1999*) to evaluate adult (and high school student) familiarity with basic

Data from the Test of Understanding College Economics (TUCE III) paint a similar picture. Table 1 presents pre- and post-test scores by race from the 1989-90 norming sample of the 30-question macroeconomics and microeconomics tests. A number of observations can be made. First, the sample is heavily weighted toward white students, who make up roughly 90 percent of the sample that identified their race on student questionnaires; blacks represent only about 3 to 4 percent of this sample. Second, black students in this sample score 1.0-2.9 points lower on the TUCE pretest than white or Asian students and slightly lower than Hispanic students. On the TUCE post-test the gap widens, with blacks scoring 3.5-4.7 points lower than white or Asian students and 1.2-2.7 points lower than Hispanic students. Third, the value-added, as measured by the difference between the TUCE pre- and post-test scores, is lowest for blacks, with the difference from other racial groups largest for the macroeconomics test. Fourth, when the TUCE results are broken down by cognitive category, the lowest gains in value-added for blacks occurs in the “implicit application” category, which includes questions requiring the highest-order thinking skills.⁴ In addition, many of the largest differences between the performance of black students and those of different racial/ethnic groups occur in this category.⁵ Overall, the results suggest that black undergraduates start with less economic knowledge in their principles-level economics courses, relative to other racial groups, and obtain less value-added in these courses, especially with respect to higher-order thinking skills. While the low number of black (and other minority) students included in the TUCE sample may generate unrepresentative results, they appear generally consistent with the MFTB results reported by Walstad and Allgood.⁶

Even less is known about the economic education of African-Americans at HBCUs.⁷ To the extent that undergraduate education in economics, especially at the principles level, plays a pivotal role in encouraging or discouraging students from pursuing additional courses or advanced degrees in economics, and to the extent that HBCUs play an important role in increasing the supply of black economists, it is important to have a better understanding of the effectiveness of undergraduate economic education at HBCUs. This paper takes a step toward improving this understanding by examining the learning outcomes of students – as measured by pre-

economic concepts and terms shows similar racial differences in economic knowledge. While 36% of white adults “received a grade of C or better for their understanding of economic concepts,” only 13% of blacks received corresponding grades. The survey was based on interviews “with a national cross-section of 1,010 adults during January and February, 1999.”

⁴ Saunders (1991) describes the three cognitive categories used to classify the TUCE III questions. The categories are based on Bloom’s (1956) *Taxonomy of Educational Objectives*.

⁵ The sum of the differences in pre-to-post-test scores for the twenty implicit application questions on the microeconomic and macroeconomic versions of the TUCE III are 3.75 (Asian), 3.06 (white), 2.70 (Hispanic) and 1.45 (black).

⁶ The data in Table 1 are based on the total number of students who identified their race on a student questionnaire that accompanied the TUCE III test. As Kennedy and Siegfried (1997) point out, however, student motivation and hence TUCE results may be affected by whether the post-test counts toward the final grade in a course. The results for the subset of students whose TUCE scores counted as part of their course grade are similar to those reported in Table 1. However, the number of observations is reduced by a third to a half.

⁷ The TUCE dataset includes observations from only one historically black university, Albany State College (14 observations in the microeconomics data, 16 observations in the macroeconomics data). To our knowledge there are no published studies that examine the learning outcomes of economics students at HBCUs. Jones (1988) discusses the broad characteristics of economics programs at HBCUs based on survey results from 26 HBCU economics departments but provides no data on student learning outcomes.

and post-testing – in a *Principles of Macroeconomics* course from a representative HBCU and comparing them to those of students from a comparable Traditionally White College and University (TWCU). We find that while students at the HBCU start the course with a lower level of economics knowledge, by the end of the course they perform similarly to the students at the TWCU, on average. Such an outcome, to the extent that it is representative of principles-level economic education at other HBCUs, indicates that students coming out of introductory economics courses at HBCUs are competitive with their counterparts at comparable TWCUs and that HBCUs add more value to their students' education than TWCUs. In addition, it suggests that there are causes other than differences in principles-level economics education at HBCUs and TWCUs that are responsible for the relatively low number of African American students pursuing economics majors or graduate degrees in economics.

DATA CHARACTERISTICS AND METHODOLOGY

Data was collected from students in *Principles of Macroeconomics* courses taught at North Carolina A&T State University (NCAT), an historically black university, and the University of North Carolina at Greensboro (UNCG), a traditionally white university, during the fall 1997 semester, the spring 1998 semester, and the spring 1999 semester. The two schools share a similar set of characteristics that make them especially attractive for this study. In particular, both schools:

- are members of the 16-school University of North Carolina system.
- offer a mix of undergraduate and graduate degrees.
- have economics departments located in a School of Business and Economics.
- offer both BA and BS degrees in economics.
- focus primarily on undergraduate education.
- are dominated by students of a single racial/ethnic category.
- are located in the same city.

Sharing a broad base of common characteristics helps to reduce the number of outside influences that may differentially affect student learning at the two institutions. Additional institutional characteristics for each school are presented in Table 2. The most important difference between the schools is their racial/ethnic makeup; black students at NCAT represent 92% of the total undergraduate enrollment while white students at UNCG account for 78% of the undergraduate enrollment. Another important difference between the two schools is class size in the *Principles of Macroeconomics* course. The average *Principles of Macroeconomics* class at NCAT is a little less than half the size of the comparable UNCG class, based on our sample data. In addition, total undergraduate enrollment is about 50% larger at UNCG than at NCAT, the percentage of women students is higher at UNCG, and entering SAT scores are about 100 points higher at UNCG than at NCAT.

Our primary focus is on the performance of students on a 14-question multiple-choice test developed by the authors that covers basic microeconomic and

macroeconomic concepts.⁸ We chose to develop our own test rather than using the well-known *Test of Understanding of College Economics (TUCE)* because we feel it does not adequately reflect the content in our courses.⁹ One disadvantage of using our own tests is that we lose the ability to compare the outcomes of our students to national norms. In our case this is not a problem, as our primary interest is in comparing the learning outcomes of students of one school against another, not against a normed sample. While the questions on our test were developed with our courses in mind, we feel that the questions cover a broad range of standard economic principles that are included in most principles-level macroeconomics courses and provide a general measure of students' economic knowledge.

Our sample includes data from six instructors, covering fifteen different course sections (6 sections from UNCG and 9 from NCAT). At the beginning of each semester each instructor administered the test to measure students' initial knowledge of economic concepts; the same questions were repeated on an end-of-course post-test. For over 85% of the sample, the post-test questions were included as part of the course final exam. Our sample includes 459 students who completed both the pre and post tests. This represents 79% of the 581 students who completed the course during the period of study.¹⁰ In addition, we collected data on a variety of student characteristics via a student questionnaire near the end of the course, as well as from institutional records. These characteristics are summarized in Table 3.

As the data indicate, the students in our sample are similar in many respects. The representative student is a 21-year-old sophomore with approximately a 2.7 grade point average who has already taken a *Principles of Microeconomics* course and a college-level algebra or calculus course, is taking a full-time load of courses, is employed about 14-15 hours per week, and studies economics about 3-4 hours per week outside of class. One difference: the UNCG students in our sample have somewhat higher SAT scores (about 70 points) than their NCAT counterparts.

MEASURING STUDENT LEARNING

Student learning is measured both in terms of students' performance on the post-test and the difference between pre- and post-test scores. Overall results on the performance of students on the pre- and post-test are listed by school in Table 4, along with results for various subgroups. The average student at NCAT scored nearly one point lower on the pretest than his/her counterpart at UNCG; with the difference significant at the 1% level.¹¹ While NCAT students enter the *Principles of*

⁸ See Appendix A for a copy of the test. Four of the questions cover basic microeconomic concepts, while the remaining ten questions cover macroeconomic concepts.

⁹ In particular, the TUCE reflects more Keynesian-oriented content than we typically include in our courses.

¹⁰ Like most investigations of student learning in economics, we employ a "matched sample" that leaves out students who failed to take the pre-test or the post-test. Becker, Powers and Saunders (1997) and Becker (1997) argue that leaving out students who drop the course or fail to complete student questionnaires may bias results obtained from such "censored" data. Much of our analysis is not dependent upon student questionnaire data but our results should be viewed as being conditional on a student remaining in the course for the entire semester.

¹¹ The difference in students' initial knowledge at each school holds for both the microeconomic and macroeconomic questions. Part of the difference is possibly due to the fact that 24% of the NCAT

Macroeconomics course with relatively less economics knowledge than UNCG students, by the end of the course students at both schools score similarly on the post-test. As a result, the difference in pre- to post-test score percentages is higher (and significant at the 1% level) for NCAT students than for UNCG students; students in our sample from NCAT experience larger gains in learning in the *Principles of Macroeconomics* course than UNCG students.

Various sub-samples show similar patterns in learning outcomes. Both males and females at NCAT show larger learning gains than the corresponding groups at UNCG, while males in each institution perform slightly better than females.¹² Of particular interest is the performance of black students at an HBCU relative to black students at a TWCU. While the number of blacks in our sample from UNCG is small, the results are informative. Black students at NCAT (UNCG) score 1.30 (1.06) points lower on their pretest than the white students at UNCG in our sample, indicating that the lower economics knowledge is related more to race/ethnicity or other non-measured socioeconomic factors rather than the type of institution the students attend. However, black students at NCAT who complete the course achieve higher gains (significant at the 5% level) in economic knowledge than their counterparts at UNCG. Black students at NCAT increase their test scores by 2.96 points versus 1.95 points for black students at UNCG and 2.21 points for white students at UNCG. The higher test-score gains for NCAT students may be due to a smaller average class size that allows for greater interaction between students and faculty or differences in teaching styles or effectiveness among professors at the two schools. Both effects are tested using regression analysis and reported later in the paper. Overall, the results suggest that black students attending HBCUs add more value to their education than those attending TWCUs.¹³ More research is needed to determine what factors are responsible for such results and whether the results can be generalized across institutions and disciplines.

Pre-to-Post-test Response Patterns

We also illustrate an alternative measure of student learning that focuses on the pre- and post-test response patterns of students to determine “patterns of persistence and change in choosing correct and incorrect responses.” (Saunders and Powers 1995, 339) We follow Saunders and Powers, who identify the four possible pre- to post-test response patterns as: *consistent knowledge* (CK) for those students who answer both the pre-test and post-test question correctly; *negative learning* (NL) for those students who switch from a correct to an incorrect answer on the pre to the post-test; *positive learning* (PL) for those students who incorrectly answer a pre-test question and then correctly answer the same post-test question; and *consistent ignorance* (CI) for those students who answer both the pre-test and post-test question incorrectly. Identifying

students in our sample did not have a previous microeconomics course, while only 5% of UNCG students did not have a previous microeconomics course. However, the results for the subset of students who had previously taken a microeconomics course are similar to those in Table 4.

¹² The latter result is consistent with most prior research in this area. See Anderson, Benjamin and Fuss (1994), Heath (1989) and Lumsden and Scott (1987), for example.

¹³ In addition to pointing out the differential learning outcomes, our results raise concerns about the *level* of learning at the principles level. On average, students at both schools answered only about 50% of the test questions correctly at the end of the principles course. Walstad and Allgood (1999) raise similar concerns.

the response patterns of each student allows us not only to summarize the overall increase in the level of learning but also to focus on the amount of value-added in the course. In particular we focus attention on the positive learning (PL) category, as we believe this category most closely represents the type of learning outcome associated with value-added.¹⁴

Table 5 lists the average percentage of student responses in each category for the overall test and three subsets of questions corresponding to specific cognitive reasoning levels (Levels I, II and III) representing low, medium and high levels of cognitive reasoning, respectively.¹⁵ The results show that overall, the percentage of students exhibiting “positive learning” (the PL column) is higher for NCAT students than for UNCG students. The difference is statistically significant at the 1% level. In addition, the PL measure for the Category III cognitive area, the subset of questions that require higher-order reasoning skills such as economic policy analysis and implicit application of economic concepts, is significantly higher (at the 1% level) for NCAT students than for UNCG students.¹⁶ Overall, the results suggest that there is significantly higher “positive learning,” or value-added for students in the *Principles of Macroeconomics* course at NCAT, relative to UNCG, especially for questions involving higher-order thinking skills. If blacks are to be successful in advanced economics courses or in graduate study in economics, these are the types of skills that are important to cultivate. The results suggest that HBCUs are capable of doing as well or better than comparable TWCUs at *improving* these thinking skills.

Regression Analysis

What accounts for the differences in pre- to post-test performance gains across the two schools in the study? Do HBCUs indeed add more value to students’ economic knowledge than TWCUs after accounting for differences in other factors that might affect learning? To explore this question we employ the well-known educational production function regression-based approach that has been widely used in economic education research since the 1970s. Within this framework, a student’s level of economic knowledge at the end of a course is typically modeled as a function of his/her pre-existing knowledge at the start of the course, along with other student, instructor, class, or institutional factors that are may affect learning during the course. End-of-course economic knowledge is measured by students’ post-test scores.

As Becker (1997, 1363) points out with reference to research based on TUCE pre- and post-tests, “of all the variations considered by researchers since 1968, the only

¹⁴ Focusing only on the PL category may understate or overstate the amount of cognitive learning, but on average we feel that this category fairly represents the notion of value-added in undergraduate economics courses. To the extent that students in the CK category also exhibit value-added in the course, the PL category understates the level of learning, but it is also possible that some students falling into the PL category simply guessed correctly on the post-test, thus leading to an overstatement of learning.

¹⁵ Our categorization of cognitive categories follows that used on the TUCE III exam. Although our selection of questions for each cognitive category is ad hoc, we believe that the questions selected reflect varying degrees of cognitive reasoning skills. Level I includes questions 5, 10, 11 and 14; Level II includes questions 1, 2, 4, 6 and 7; and Level III includes questions 3, 8, 9, 12 and 13. The selection of questions in each category was done prior to any statistical analysis.

¹⁶ The no-learning (NL) and continuing ignorance (CI) measures are similar across the two schools. The continuing knowledge (CK) measures for UNCG students, while not (statistically) significantly different from those for NCAT students, are somewhat higher, reflecting the higher pretest scores for UNCG students.

consistently significant and meaningful explanatory variables of post-TUCE scores are pre-aptitude measures such as pre-TUCE and SAT/ACT scores.” We use students’ pre-test scores, as well as SAT scores and student grade-point averages (GPA) obtained from institutional data, as our measures of students’ initial aptitude.¹⁷ Along with students’ pre-test scores, SAT scores and GPA, our full set of explanatory variables includes the following:¹⁸

HBCU	Institutional dummy; HBCU=1 for NCAT and 0 for UNCG
INSTRUCTOR _x	0-1 instructor dummies; $x = 1$ to 6 (4 instructor dummies for NCAT professors and 2 instructor dummies for UNCG professors)
CUMCREDIT	Cumulative semester hours earned at the start of the semester
CLASSSIZE	Number of students enrolled in the course at end of semester
GENDER	GENDER=0 if a student is male and 1 if female
AGE	Age of student
WORKHOURS	Average number of student hours worked per week, including college work study
PREMICRO	PREMICRO=1 if a student had a previous microeconomics course, 0 otherwise
SEMOURS	Number of semester hours of courses the student was enrolled in during the semester
MATHLEVEL	Highest math course completed at start of semester; MATHLEVEL=1 for high school algebra, 2 for college algebra, 3 for college calculus (1 semester), and 4 for more than 1 semester of college calculus
STUDYTOTAL	Average number of hours per week spent studying for all courses
STUDYECON	Average number of hours per week spent studying economics

Given the results in the last section, we are particularly interested in the coefficient on the HBCU dummy variable, but we also include 0-1 instructor dummy variables to account for the possibility that instructor-specific factors, rather than institutional ones, may be responsible for the differences in learning outcomes illustrated in Table 3. Normally in ordinary least squares regression, when a set of dummy variables is included in the regression, researchers leave one out and interpret the estimated dummy variable coefficients with respect to the dropped dummy variable. However, because the institution dummy (HBCU) is a linear combination of the remaining instructor dummies even after one of the instructor dummy variables is dropped from the regression, the standard dummy-variable approach is not feasible. To overcome this estimation problem, we follow Suits (1984) and restrict the sum of each school’s instructor dummies to equal 0, with the restrictions weighted by the proportion of each school’s students taught by a particular instructor, as suggested by Kennedy (1986). All results reported were obtained by restricted least squares, implementing the two sets of instructor dummy restrictions. Our initial model

¹⁷ Using institutional data, rather than student-reported data reduces the type of measurement error reported by Maxwell and Lopus (1994), as well as the bias problem noted by Becker, Powers and Saunders (1997).

¹⁸ All but the first four are self-reported on an end-of-course student questionnaire.

includes the full set of independent variables listed above, using students' post-test scores as the dependent variable. We then test down to a final model specification, dropping variables that are not significant at the 5% level. In each model we include the instructor dummy variables, as well as the HBCU dummy, our variable of interest. Due to missing observations for some student-reported variables, the sample size varies across the different model specifications.

The first set of regression results in Table 6 illustrates Becker's point about the lack of significant explanatory variables. Besides the variables indicating a student's aptitude or previous knowledge, only the AGE variable is statistically significant at the 5% level in model 1.¹⁹ The HBCU dummy variable is positive, but insignificant. When the insignificant variables are dropped from the regression specification (model 2 in Table 6), the HBCU variable remains positive and becomes statistically significant, while the GPA variable becomes marginally insignificant. Dropping the GPA variable from the regression model produces the final specification, model 3 in Table 6. The results show that after accounting for instructor differences and variation in student attributes, there is a significant school effect, adding two-thirds of a point to NCAT students' post-test scores. Given the differences in class sizes between the two schools, we were concerned that multi-collinearity may have led both the HBCU and CLASSSIZE variables to be insignificant in the original model, so we added CLASSSIZE to model 3 to determine how much of the institutional effect is caused by these differences. As the results for model 4 indicate, adding the CLASSSIZE variable reduces the significance of the HBCU dummy variable, although the coefficient is still positive and the CLASSSIZE variable is statistically insignificant.

Given the marginal insignificance of the GPA variable in model 2, we also examined a modified version of model 4, with GPA added. The results for this model are similar to those for model 4: the HBCU variable remains positive but the significance level is further reduced (p-value of .27), while the CLASSSIZE variable becomes even less significant (p-value of .71). Dropping the insignificant CLASSSIZE variable results in model 2.²⁰ In addition, we estimated regression models using the difference between the post-test and pre-test scores as the dependent variable and reached similar results, so we report only the results for the post-test specification.²¹ As before, the HBCU dummy variable is positive and statistically significant (at the 5% level), in this case even when CLASSSIZE is added back into the regression.

¹⁹ Given our results in Table 4 comparing male and female test performance, it is interesting to note that the GENDER coefficient is insignificant, although negative.

²⁰ In recognition of Becker, Powers and Saunders' (1997) concerns about loss of observations due to use of student-reported questionnaire responses, we also ran regression models similar to model 2 with SATTOTAL and AGE omitted, with and without CLASSSIZE added. The sample for these models includes 440 out of the 459 total observations in our data set. The results are again similar to those reported above, with a slightly lower adjusted R^2 (0.32).

²¹ This specification of the model is perhaps more closely associated with the value-added measures developed in the last section. The difference specification is also likely to avoid problems of estimation bias that may exist when using pre-test scores as a regressor in models attempting to explain variation in post-test scores. See Kennedy (1994) and Becker (1983) for a discussion of this issue. Kennedy and Siegfried (1997, 7), however, argue against this specification, noting that "this measure is questionable because students have no incentive to make an honest effort when answering the pretest questions."

Overall, the regression results support the conclusions reached in the previous sections. While students at NCAT start out with less economic knowledge, the value-added, in terms of differences between post- and pre-test scores, is (statistically) significantly higher at NCAT than at UNCG. On average, students at NCAT gain two-thirds of a point on their post-test, relative to students at UNCG, after accounting for differences in age, SAT and pre-test scores. This effectively eliminates the nearly one-point difference that exists between UNCG and NCAT students at the beginning of the course; at the end of the course students at both schools perform similarly, in terms of their post-test scores. To the extent that this result can be extrapolated to other TWCUs and HBCUs, it suggests that economics students at HBCUs and TWCUs leave the principles course with similar economic skills.

SUMMARY AND CONCLUSIONS

The results of this study are an initial attempt to systematically compare the learning outcomes of *Principles of Economics* students at HBCUs and TWCUs. The evidence for the two schools in our study suggests that students at HBCUs perform similarly to those at TWCUs by the end of the traditional principles course, although they start from a lower level of economic knowledge. That is, our data imply that HBCUs add more value than TWCUs to students' stock of knowledge in the principles course, even after accounting for prior knowledge, general aptitude and a variety of other factors.

In addition, our study raises additional questions that require further research about the learning outcomes of African-American economics students and the role of HBCUs in their education. For example, what is the cause of the positive HBCU dummy variable in our analysis? Perhaps HBCUs provide a more nurturing environment for black students than TWCUs, generating positive role-model or mentoring effects, leading to higher gains in economic knowledge.²² More research is needed to determine whether the institutional effect we find is the result of this phenomenon and whether it is representative of other HBCUs. Our regression results also show that instructor-specific influences play a significant role in the learning outcomes of students, especially at the HBCU. More research is needed to better understand the roles that instructors, pedagogical techniques, institutional environments and class-size play in the education of African-American students. Our results indicate that these factors may be influential.²³

²² The positive effect of role models (with respect to gender and race/ethnicity) is discussed in Catanese (1991) while Jones (1988, 8) argues that "the absence of ethnic identification between HBCU students and faculty may affect the ability of these (HBCU economics) programs to attract black Americans as majors."

²³ The economic education literature suggests that such factors have a disproportionate effect on black students (as well as women), relative to white male students. Bartlett (1996) and Bartlett and Feiner (1992), for example, highlight the mismatch between traditional economics teaching methods and the dominant learning styles of African American students. They suggest that teaching strategies that encourage active and cooperative learning are likely to improve the educational performance of minority students and encourage further study in economics. Siegfried et al. (1991) make similar arguments. An important question is whether teachers who employ more active-learning exercises or material related to students' racial/ethnic experiences generate higher levels of learning among black students than those who primarily lecture do. Lage and Treglia (1996) have found that inclusion of more *gender*-specific

Beyond the value-added outcomes of our study, what implication do our results have for increasing the number of African Americans considering economics majors or advanced degrees in economics; i.e. increasing the supply of black economists? They suggest that the reason for the low numbers of blacks pursuing economics degrees at the undergraduate and graduate level is *not* one of inferior principles-level economic education at HBCUs, where a disproportionate share of black students earn their degrees.²⁴ Again, additional research is necessary to better understand the dynamics underlying the continuing low percentage of black students that pursue careers in economics. An examination of economic education at HBCUs should play an important role in that research, given the importance of HBCUs as a source of black graduates in the U.S. The evidence presented here suggests that students at HBCUs perform similarly to students at TWCUs at the end of a typical principles-level economics course. Future research, it seems, should focus on what causes black students to abandon economics as a career choice beyond this level.

APPENDIX A: TEST QUESTIONS USED IN THE STUDY

1. An increase in the supply of a good will lead to
 - a. an increase in both the price and the quantity produced of the good.
 - b. an increase in the price of the good but a reduction in the quantity produced of the good.
 - c. a reduction in both the price and the quantity produced of the good.
 - d. a reduction in the price of the good but an increase in the quantity produced of the good.

2. If the demand for a product is increasing at the same time that the supply of that product is increasing, then
 - a. the quantity sold of the good is likely to increase, but the change in price is indeterminate.
 - b. the quantity sold of the product is likely to decrease, but the price of the product is likely to increase.
 - c. the price of the product is likely to increase, but the change in quantity sold is indeterminate.
 - d. the price of the product is likely to fall, but the quantity sold is likely to increase.

material increases economic knowledge for all students in a principles-level course, but especially for the women. Similar results may be possible with respect to race and ethnicity.

²⁴ If not differences in the quality of economic education, then what explains the relatively low number of students from HBCUs pursuing advanced degrees in economics? Agesa, Granger and Price (1999) suggest that the research environment students are exposed to while undergraduates plays an important role in influencing decisions to pursue graduate-level economic education. Using data on faculty research productivity, they argue that “any interventions at HBCUs that create incentives for more faculty research in economics would have the effect of enhancing teaching effectiveness and increasing the supply of black Ph.D. economists.”

3. With a week's worth of labor Country X can produce 1600 loaves of bread or 400 gallons of orange juice while Country Y can produce 600 loaves of bread or 300 gallons of orange juice with a week's worth of labor. The theory of comparative advantage, which is based on opportunity cost, implies that under these conditions, Country X would find it advantageous to
 - a. specialize in bread production and import orange juice from Country Y.
 - b. specialize in orange juice production and import bread from Country Y.
 - c. import both bread and orange juice from Country Y.
 - d. export both bread and orange juice to Country Y.

4. If the *current price* of a good is below the equilibrium price of that good
 - a. consumers will be able to buy all they want at the current price.
 - b. suppliers will be able to sell all that they produce at the current price.
 - c. there will be a surplus at the current price.
 - d. we can expect the equilibrium price of the good to fall.

5. During a typical economic expansion in the United States,
 - a. the unemployment rate falls and the price level rises.
 - b. the unemployment rate rises and the price level falls.
 - c. the unemployment rate rises and price level rises.
 - d. the unemployment rate falls and the price level falls.

6. If the exchange rate between U.S. dollars (\$) and Japanese yen changes from \$1 = 125 yen to \$1 = 100 yen, and domestic prices in both countries stay the same,
 - a. U.S. products will be more price-competitive in Japan.
 - b. U.S. imports of Japanese goods are likely to increase.
 - c. Japanese products will be more price-competitive in the U.S.
 - d. Japanese exports to the U.S. are likely to increase.

7. In the long run, the most successful way to permanently increase the buying power of workers' wages is to:
 - a. raise the minimum wage paid to workers.
 - b. increase the productivity of workers.
 - c. increase the number of workers covered by union contracts.
 - d. index workers' wages to inflation.

8. An increase in the inflation rate that is accompanied by an increase in unemployment is most likely caused by
 - a. an increase in consumer spending.
 - b. an increase in interest rates.
 - c. an increase in worldwide oil prices.
 - d. an increase in technological development.

9. Which of the following is most likely to cause an increase in the U.S. unemployment rate in the short run?
 - a. an increase in consumer spending.
 - b. an increase in government spending.
 - c. an increase in interest rates.
 - d. an increase in technology.

10. Which of the following is most likely to lead to a permanent increase in living standards, measured in output-per-person?
 - a. an increase in net exports.
 - b. an increase in investment spending.
 - c. an increase in interest rates.
 - d. an increase in the federal government budget deficit.

11. When the U.S. experiences a trade deficit with another country, it finances that deficit by
 - a. printing additional money.
 - b. raising corporate and personal income taxes.
 - c. taxing imports from the country with which it has a deficit.
 - d. selling U.S. assets (real estate, stocks, etc.) to foreign citizens and governments.

12. If the demand for goods and services in the economy is rising faster than the productive capacity of the economy, we are likely to observe
 - a. an increase in the unemployment rate and an increase in the inflation rate.
 - b. an increase in the unemployment rate and a reduction in the inflation rate.
 - c. a reduction in the unemployment rate and a reduction in the inflation rate.
 - d. a reduction in the unemployment rate and an increase in the inflation rate.

13. If the U.S. economy is currently producing at a level well below its potential output level and unemployment rates are rising, which of the following economic policies would be the most appropriate?
 - a. A reduction in government spending to reduce the budget deficit.
 - b. A reduction in interest rates by the Federal Reserve.
 - c. An increase in corporate and personal income taxes.
 - d. A reduction in the length of time unemployed workers can receive unemployment benefits.

14. The limit of an economy's total productive capacity at any given time is set by
 - a. the amount of money in circulation.
 - b. business demand for goods and services.
 - c. the level of government spending and taxation.
 - d. the quantity and quality of its productive resources.

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