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An Analysis of the Age Distribution of Accounting Ph.D. Faculty Members and the Relationship Between Faculty Age and Selected School Characteristics

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ABSTRACT

For decades, the accounting profession has been concerned about a potentially increasing shortage of accounting faculty, particularly faculty members with a Ph.D. in Accounting. This current and future shortage has been attributed to a combination of (1) a limited and often decreasing supply of accounting Ph.D. graduates, and, (2) a large number of accounting faculty that are at, or approaching, retirement age. For example, a previous analysis co-sponsored by the AICPA and the American Accounting Association concluded, at the time of the study, that between 500 and 700 accounting faculty per year would retire over the following ten years, while accounting Ph.D. programs were averaging only 140 graduates per year (Ruff et al., 2009). Other previous studies have expressed a similar concern (for example, Buchholz et al., 2013; Boyle et al., 2015; Plumlee et al., 2006). Using the accounting faculty database maintained by the American Accounting Association (with a population of 11,468 individual faculty members teaching accounting at the college level), and additional data obtained from the AACSB and IPEDS, this study conducts the following: (1) a descriptive analysis of the age distribution of individual faculty members with a Ph.D. in accounting, with a focus on faculty members teaching at U.S. institutions, and, (2) regression analysis examining the relationship between the age of each school's accounting Ph.D. faculty and selected school characteristics. Results provide evidence on the existing age distribution of current faculty with Ph.D.s in accounting, and particularly, evidence on the types of schools that will be most impacted by future retirements of an aging faculty.

I. INTRODUCTION.

Accounting research has forecasted and documented the shortage of Ph.D. qualified faculty for the past few decades (Boyle, et al., (2015), Fogarty and Holder (2012), Plumlee, et al., (2006)). This issue is also high on the list of concerns facing accounting firms, academic administrators and faculty, and others within the accounting profession. If the shortage of accounting faculty eventually causes capacity and/or quality constraints in accounting students being able to prepare for entry into the profession, accounting firms may find it difficult to recruit new hires they need to maintain their businesses. Alternatively, such a shortage could increase an accounting firm's costs if they have to do more initial training, both in technical skills and critical thinking ability. Accounting academia may suffer if the decline in Ph.D. qualified faculty results in capacity constraints that lead to (1) increased teaching loads (both in terms of increased sections taught and/or increased preparations), (2) increased class sizes, (3) decreased time and resources to conduct the research necessary to maintain/enhance the intellectual capacity of the profession, obtain tenure and promotion, and, (4) declining enrollments as potential future accounting students select other fields if the perceived quality of an accounting education declines.

One of the factors contributing to the perceived shortage of Ph.D. qualified faculty is the documented aging of existing accounting faculty (Behn, Ezzell, Murphy, Rayburn, Stith, Strawser, 2012). The prior research we have

identified related to the age of accounting faculty is approximately a decade old or more. Therefore, one purpose of this paper is to update the assessment of the average age of current Ph.D. qualified accounting faculty. In other words, one of our research questions is, does the forecast of increasing retirements of accounting faculty made in prior research look more or less likely now? Second, we attempt to refine this basic question by attempting to assess whether the age of Ph.D. qualified faculty differs across types of programs/institutions. Specifically, we examine whether the average age of Ph.D. qualified accounting faculty is higher or lower between (1) AACSB accredited vs. non-accredited schools, (2) schools with vs. without additional AACSB accounting accreditation, (3) schools that have vs. do not have a Ph.D. program, (4) the extent to which faculty within a program are qualified for accreditation as Scholarly Academic ("SA") for AACSB purposes, (5) public vs. private schools, (6) if the school offers only undergraduate education vs. also offering graduate degrees, (7) geographic characteristics of the school (classified as urban or not), (8) size of the accounting program as measured by total faculty in the accounting department, and, (9) size of the school as measured by total institutional enrollment. Some of these variables have been assessed from the supply side of accounting academia (i.e. whether they are correlated with the number of Ph.D. students produced), but virtually none of these variables have been investigated as to whether they are related to the age distribution of the accounting faculty.

By examining age, we do not intend to suggest that age has a negative effect on the quality of accounting education. In other words, we do not suggest that two schools that differ in the mean age of the accounting faculty will therefore differ in the quality of the accounting education because of that difference in mean faculty age. Rather, we examine differences in the mean age of accounting faculty in order to determine the types of schools that will be most impacted by future retirements of an aging faculty. Furthermore, there is certain quantitative, and certainly anecdotal evidence, (including the intentions of some faculty at the institution where we work!) to suggest that on average, accounting faculty work past the traditional retirement age. However, our research questions presume that as faulty members age, on average, it becomes more likely that they will eventually retire and therefore ceteris paribus, increase the demand for Ph.D. qualified faculty. Moreover, if age differs across some of the different types of institutions, are there certain types of institutions that may face more risk related to any potential shortage of Ph.D. qualified faculty?

Our paper consists of five parts. After this introduction, we review some of the prior literature related to the accounting Ph.D. qualified faculty shortage. We then discuss the methodology of the present inquiry, followed by a discussion of the results of our study. Finally, we discuss some potential implications and opportunities for future research.

II. PRIOR RESEARCH.

Boyle, Carpenter and Hermanson (2015) report the results of a survey of 800 accounting faculty and administrators about the perceived accounting faculty shortage. They observed that accounting educators generally believed that, at the time of their study, the shortage of doctoral qualified accounting faculty was "moderate" but would become "more pronounced in smaller, public, and non-doctoral institutions" (245). Their survey also yielded results indicating accounting academics would welcome former practitioners into the ranks of accounting academia, but that there was only moderate support for practitioners to become qualified via non-traditional, more flexible doctoral programs.

Plumlee and Reckers (2014) report the results of surveys of Ph.D. Program administrators and both Master's and accounting doctoral students across three issues related to the perceived shortage of Ph.D. qualified faculty in accounting. Specifically, they examine the "cumulative impact of the Ph.D. shortage as of 2013, including its impact on accounting faculty composition, across different types of institutions, (2) negative student perceptions of Ph.D. programs and academic accounting careers, which discourage applicants from pursuing Ph.D. programs, and (3) impediments facing institutions in expanding doctoral programs" (313). Their results indicate that as late as 2013, the shortage harmed accounting programs in several ways including capacity issues such as larger class sizes, the numbers and types of accounting courses offered and accreditation challenges. They also maintain that their surveys indicate that as of 2013, little change occurred among doctoral accounting programs to increase the supply of Ph.D. qualified faculty. Their survey results also indicated that students in accounting Master's programs generally had a number of negative perceptions about starting accounting doctoral programs.

Fogarty and Holder (2012) examined the decline of students in accounting Ph.D. programs between 1989 and 2008. They asserted "any group that cannot adequately replenish its ranks with dedicated full-time initiates becomes seriously threatened by aging and retirements" (373). Their results indicated that the decline in new students in accounting doctoral programs appeared to be larger "for middle prestige schools, for larger universities, and for

public schools" (373). They also showed results consistent with the notion that this decline often coincided with pressures on academic institutions to do such things as emphasize MBA programs over doctoral programs in order to increase revenues and improve their program rankings among business periodicals.

Hunt, Eaton and Reinstein (2009, 157) conducted survey research in order to examine the "job search and selection" process of both accounting Ph.D. students and faculty who relocated from 2002 to 2004. The authors conducted the research in order to identify implications for schools attempting to recruit accounting faculty. Such recruiting is presumed to become more difficult given the persistent shortage of doctoral qualified accounting faculty. Their results were consistent with the conclusion that new faculty are especially concerned with such things as the likelihood of obtaining tenure, teaching loads, salaries, being able to teach the classes they want, and geographic location.

Plumlee, Kachelmeier, Madeo, Pratt and Krull (2006), reported the results of an American Accounting Association (AAA) survey that indicated accounting department heads/chairs, Ph.D. program directors, and then current accounting doctoral students reported overall shortages of Ph.D. students, particularly in the auditing and tax specialties. Survey results were also consistent with the existence of some negative perceptions about engaging in doctoral programs. Brink, Glasscock and Wier (2012) followed up on the AAA survey reported by Plumlee, et al. (2006), and found that in addition to the persistence of the Ph.D. qualified accounting faculty shortage, the impediments of addressing the shortage identified in the AAA survey persisted.

In response to prior research documenting the accounting faculty shortage, Trappnell, Mero, Williams and Krull (2009) made six recommendations to address the problem. Their recommendations included (1) funding competitive research programs aimed at providing additional funds for doctoral students, (2) research grants aimed at faculty time buyouts to reduce faculty capacity constraints, (3) including overhead cost recovery in research grants for grantee schools, (4) improving access to data suitable for accounting research by enhancing the confidentiality protections of such data, (5) market competitive doctoral student stipends (to reduce the opportunity costs for students who are considering entering accounting doctoral programs), and (6) making doctoral programs more efficient in such things as "time to degree" in order to reduce the opportunity costs of accounting doctoral programs (431).

There are at least two characteristics of the academic inquiries referenced above that motivate our present study. First, the most recent of these papers were published five years ago, and the data upon which they rely is at least six years old; most of the studies use data that is at least a decade old. Inquiry into assessing the extent of the shortage of accounting doctoral qualified faculty should be updated with more recent data regarding age characteristics of current accounting faculty. Second, as is apparent by reviewing the research referenced above, almost all of the academic inquiry addresses the accounting faculty shortage in terms of the decline in students in accounting doctoral programs. That is, with the exception of Boyle, et al. (2015), Hasselback (2011), and some older reports by the AAA and the AICPA, these studies have largely addressed the supply side of the shortage. Specifically, they address the extent to which there are fewer students enrolled in accounting Ph.D. programs, they may try to explain why such enrollments are in decline, and/or they offer suggestions to improve such accounting doctoral program enrollments.

While we agree that a shrinking supply of new accounting academics is an important issue, we maintain that research should also investigate demand forces contributing to the shortage, including demographic characteristics of the present accounting faculty. Such demographics would include the extent to which faculty are approaching (or often reaching) the presumed retirement age. Therefore, the purpose of this study is to (1) provide an empirical analysis of the age characteristics of current accounting faculty (i.e., faculty with Ph.D.s in accounting), and, (2) examine whether certain types of schools may be impacted more negatively by the aging population of accounting professors, combined with a limited and/or decreasing supply.

III. RESEARCH DESIGN.

Sample.

Information on current faculty members teaching accounting at the university level was obtained from the Accounting Faculty Database maintained by the American Accounting Association ("AAA"). Information contained in the database included, for each faculty member, the faculty member's name, institution name, college and department name, geographic location, academic rank, teaching area, certifications held, highest degree earned, discipline of highest degree, and year of highest degree. For certain individual faculty members, certain variables may have missing information. In total, there were 11,468 individual faculty members listed as teaching accounting at the university level. This included faculty members at all ranks, all levels of highest degree earned and all

disciplines of highest degree earned. There were 1,124 unique educational institutions represented (hereafter referred to as "schools"). Table 1 contains a summary of the number of faculty members and schools represented in the AAA database.

Additional data on the characteristics of each school was obtained from (1) data maintained by the Association to Advance Collegiate Schools of Business ("AACSB") accrediting agency, and, (2) data listed on the Integrated Postsecondary Education Data System ("IPEDS") website. Variables based on the data collected from these sources will be discussed in a subsequent section.

Calculation of and Validation of Individual Faculty Member Age.

We calculated an individual accounting faculty member's age, based on the year they earned their doctorate degree, as listed in the Accounting Faculty database obtained from the AAA. We took a sample of all accounting Ph.D. faculty members listed in the AAA Accounting Faculty database employed by universities in a large southwestern state. For each faculty member in our limited sample, we determined the faculty member's actual current age using publicly available databases such as Intellius, Pipl, and White Pages. Using this method, we calculated a mean age of 34 when earning the doctorate. We then "estimated" the current age of all faculty members in our full sample by taking the number of years since they earned their doctorate plus 34 years. Our estimate of 34 years old as the average age when an accounting faculty member earned a doctorate is consistent with surveys conducted by the Survey of Earned Doctorates ("SED") where they found that the average age of an earned doctorate in all fields of Business Management is 34.7 years of age (SED, 2019).

Hypotheses Development.

One of the main purposes of this study is to examine the relationship between the age of a school's accounting faculty and certain identifying characteristics of that school. In other words, to examine the types of schools that may be impacted most by any current or future retirement of an "aging" accounting faculty. Specifically, we calculate the following variables for each school.

AACSBACCREDITED	=	1 if the School has AACSB Accreditation; 0 otherwise
ACCTACCREDITED	=	1 if the School has Additional AACSB Accounting Accreditation; 0 otherwise
PHDINACCT	=	1 if the School offers a Ph.D. in Accounting; 0 otherwise
PERCENTSA	=	Percentage of Accounting Ph.D. Faculty Classified as "Scholarly Academic"

ISPUBLIC	=	1 if the School is a Public Institution; 0 otherwise
UGONLY	=	1 if the School has Undergraduate Students only; 0 otherwise
ISURBAN	=	1 if the School is classified by IPEDS as Urban; 0 otherwise
TOTALFACULTY	=	Log of the total number of faculty in the Accounting Department/Unit
ENROLLMENT	=	Log of Total Full Time Student Enrollment

For the above variables, *AACSBACCREDITED*, *ACCTACCREDITED*, *PHDINACCT*, *PERCENTSA*, and *UGONLY* were obtained from the AACSB database. The variables *ISPUBLIC*, *ISURBAN* and *ENROLLMENT* were obtained from the IPEDS database. And data for *TOTALFACULTY*, (the number of faculty in the accounting department/unit) was obtained from the AAA database.

In examining the relationship between the identifying characteristics of each school (identified above) and the age of that school's accounting Ph.D. faculty, we calculated the following three age related variables for each school:

1. the mean age of the school's faculty with Ph.D.s in accounting,
2. the standard deviation in age of the school's faculty with Ph.D.s in accounting, and,
3. the percentage of the school's accounting Ph.D. faculty over 65 years of age.

Following are the hypothesized relationships between each of the three measures of faculty age and each of the nine identifying school characteristics.

Hypotheses Related to a School's Mean Faculty Age.

It is hypothesized that AACSB accredited schools will typically have higher requirements regarding faculty qualifications, including higher requirements for research, tenure, and promotion. Because of these stricter requirements, faculty turnover may be higher, resulting in the periodic replacement of existing faculty with newer, and often younger, accounting Ph.D. faculty. Therefore, we hypothesize the following:

H_{1a}: AACSB accredited schools will have a significantly lower mean faculty age than non-AACSB accredited schools. (There will be a negative relationship between mean faculty age and the school's AACSB accreditation status).

For reasons similar to the above, it is hypothesized that schools with additional AACSB accounting accreditation will have the same or even higher requirements regarding faculty qualifications. Therefore, we hypothesize the following:

H_{2a}: Schools with additional AACSB accounting accreditation will have a significantly lower mean faculty age than schools without additional AACSB accounting accreditation. (There will be a negative relationship between mean faculty age and the school's additional accounting accreditation status).

Similarly, it is hypothesized that schools with a program offering a Ph.D. in accounting will have higher requirements for faculty qualifications, leading to the following hypothesis:

H_{3a}: Schools that offer a Ph.D. in accounting will have a significantly lower mean faculty age than schools without a Ph.D. in accounting program. (There will be a negative relationship between mean faculty age and the school's offering of a Ph.D. program in accounting).

In addition, it is hypothesized that schools that have a higher percentage of "scholarly academic" faculty (as that term is defined by the AACSB and further defined by the school) will have a higher proportion of younger faculty, and therefore:

H_{4a}: Schools with a higher percentage of "scholarly academic" faculty will have a significantly lower mean faculty age than schools with a lower percentage of "scholarly academic" faculty. (There will be a negative relationship between mean faculty age and the school's percentage of accounting faculty classified as "scholarly academic).

Prior research has shown that public universities tend to be larger, offer more degree programs, have potentially higher standards to meet the requirements of various accreditation agencies, and may also have additional sources of revenue and/or resources compared to their non-public counterparts. Similar to the consequences of AACSB accredited schools, faculty turnover in public universities may be higher, resulting in the periodic replacement of existing faculty with newer, and often younger, accounting Ph.D. faculty. With these differences in mind, we hypothesize the following:

H_{5a}: Public universities will have a significantly lower mean faculty age than non-public universities. (There will be a negative relationship between mean faculty age and the school's public status).

In addition, it is hypothesized that universities that offer undergraduate programs only, may not have as stringent requirements for faculty qualifications as universities that offer graduate programs. Therefore, turnover may be lower, resulting in longer tenured faculty at institutions that offer undergraduate programs only. Therefore, we hypothesize the following:

H_{6a}: Schools that offer undergraduate programs only will have a significantly higher mean faculty age than schools that also offer graduate programs. (There will be a positive relationship between mean faculty age and the school's offering of undergraduate programs only).

The IPEDS database identifies the geographic status of a school on an urban continuum ranging from "large city" to "rural." The status is based on a school's physical location assigned through a methodology developed by the U.S. Census Bureau's Population Division in 2005. Based on IPED's classification, and for purposes of this study, a school is defined as urban if the school is located in an urbanized area with a population of 100,000 or more. We hypothesize that schools classified as urban will, other things equal, have a greater ability to attract and retain younger accounting Ph.D. faculty members over time. Therefore, we hypothesize the following:

H_{7a}: Schools that are classified as urban will have a significantly lower mean faculty age than schools that are classified as non-urban. (There will be a negative relationship between mean faculty age and the school's classification as urban).

Finally, we hypothesize that schools that are larger, other things equal, will potentially offer more degree programs, have potentially higher standards to meet the requirements of various accreditation agencies, and may also have additional sources of revenue and/or resources compared to smaller schools. A combination of factors could both require and allow the school to attract and retain highly qualified (often younger) accounting Ph.D. faculty members. We hypothesize that larger schools would therefore have a younger accounting faculty. We measure school size using the following two variables: (1) total number of faculty in the school's accounting department/unit, a proxy used to measure the size of the accounting program, and, (2) total full-time equivalent student enrollment, a proxy used to measure the size of the school as a whole. We hypothesize the following:

H_{8a}: Schools that have a larger total number of accounting faculty will have a significantly lower mean faculty age than schools that have a smaller number of faculty. (There will be a negative relationship between mean faculty age and the size of the school's accounting faculty).

H_{9a}: Schools that have a larger total number of full-time students will have a significantly lower mean faculty age than schools that have a smaller number of full-time students. (There will be a negative relationship between mean faculty age and the size of the school's student enrollment).

Hypotheses Related to a School's Standard Deviation of Faculty Age.

The previous hypotheses dealt with how each of the nine selected school characteristics might cause the mean age of the accounting Ph.D. faculty to vary across schools. We now hypothesize that these same school characteristics might also cause the distribution of the ages within a school to also vary across schools. For example, consider a school that has higher standards for faculty qualifications, including higher standards for faculty research, tenure, and promotion. Given the higher standards of that school, we previously hypothesized that faculty turnover may be higher, resulting in the periodic replacement of existing faculty with newer, and often younger, accounting Ph.D. faculty. This led to our hypothesis that the mean faculty age for that school would be lower compared to schools that did not have such high standards. However, we now hypothesize that the standard deviation of the ages within that school will actually be higher, since over time faculty that remain will continue to age, while replacements of exiting faculty will form a younger pool of faculty. This would form a wider distribution of faculty ages within that school, and thus, a higher standard deviation. Therefore, for each of the nine school characteristics discussed in the previous section, the hypothesized sign for the relationship between each school characteristic and the standard deviation of the faculty ages will be opposite of the sign for the relationship between each school characteristic and the mean of the faculty ages. For example, for schools that have AACSB accreditation, we hypothesized that AACSB accredited schools will have a significantly lower mean faculty age than non-AACSB accredited schools, i.e., there will be a negative relationship between mean faculty age and the school's AACSB accreditation status. Based on our discussion above, we now further hypothesize that AACSB accredited schools will have a significantly higher standard deviation of faculty ages than non-AACSB accredited schools, i.e., there will be a positive relationship between the standard deviation of the faculty ages and the school's AACSB accreditation status. Similar hypotheses are made for each of the nine school characteristics; the hypothesized sign of the relationship between the standard deviation of faculty ages and each school characteristic will be opposite the hypothesized sign for the relationship with the mean of the faculty ages. Specific hypotheses for each of the nine variables (H_{1b} through H_{9b}) are listed in Table 7.

Hypotheses Related to a School's Percentage of Faculty over 65 Years of Age.

In addition to the mean age of a school's accounting Ph.D. faculty, of particular interest would also be the percentage of that school's faculty that are nearing retirement age. In other words, schools that have a higher percentage of faculty that are at or near retirement age would be the schools most impacted by an impending wave of faculty retirements. In order to examine this impact, we calculated the percentage of accounting Ph.D. faculty that are at or over 65 for each school. For the full sample of accounting Ph.D. faculty, over 22% are 65 or older (see descriptive statistics to be discussed in the following section), but that percentage will vary across schools. We hypothesize that the percentage of a school's accounting faculty over 65 will be related to the school characteristics we examined in the same manner as the mean of the faculty age for that school. However, we argue that the percentage of faculty nearing retirement age for a particular school may be a more critical measure than simply the mean faculty age for that school, as the percentage of faculty over a certain age will be more indicative of the impact on that school from faculty retirements within a given number of years. Therefore, we use regression analysis to examine the relationship between the percentage of a school's faculty over 65 and the nine variables (i.e., the identifying characteristics) for that school. The hypothesized sign of each relationship will be the same as was the hypothesized sign for the relationship between the identifying school characteristics and the mean of the faculty age. Specific hypotheses for each of the nine variables (H_{1c} through H_{9c}) are listed in Table 8.

IV. EMPIRICAL RESULTS.

Descriptive Statistics on the Age of Individual Faculty Members in the Sample.

Based on an analysis of the Accounting Faculty database maintained by the American Accounting Association, the mean age of U.S. faculty with a Ph.D. in accounting is 54.76. This is slightly higher than the mean age for U.S. accounting faculty with a Ph.D. in other disciplines. In addition, almost half of all U.S. faculty members with a Ph.D. in accounting are equal to or over the age of 55, and over 35% are equal to or over the age of 60. If one assumes an average retirement age of 65, over 22% of all U.S. faculty members with a Ph.D. in accounting are passed retirement age.[1] Table 2 contains a further summary of the age characteristics of individual faculty members in the sample. Figure 1 contains a graphical and more detailed numerical analysis, by individual

[1] Recent research, however, indicates that university faculty members across the U.S. seem to be delaying retirement until past 65 years of age.

year, of the percentage of U.S. faculty members with Ph.D.s in accounting that are equal to or greater than the age of "X." The analysis in Figure 1 is based on all accounting faculty with Ph.D.s in accounting that are teaching in U.S., as contained in the database maintained by the American Accounting Association.

Descriptive Statistics on the Mean Faculty Age for Individual Schools in the Sample.

There were 880 unique U.S. schools in the sample.[2] For each school, the mean age was computed for the school's faculty with a Ph.D. in accounting. Based on the results, over 15% of all schools have a mean accounting faculty age greater than or equal to 60, and over 35% of all schools have a mean accounting faculty age greater than or equal to 55. Table 3 contains a further summary of the age characteristics of individual schools in the sample. Table 3 also contains a correlation matrix of the nine variables for school characteristics. Figure 2 contains a graphical and more detailed numerical analysis, by year of age, of the percentage of schools with a mean age of accounting Ph.D. faculty greater than or equal to the age of "X."

Regression Results Examining Mean Faculty Age.

Regression analysis was used to measure the hypothesized relationship between the mean age of each school's accounting Ph.D. faculty and each of the nine selected school characteristics described in Section III. Table 4 presents the results of this analysis. For comparative purposes, the regression model was calculated for two sample groups: (1) the full sample of 1,070 schools in the AAA database (described in Table 1), and, (2) the sample of 880 schools located in the U.S. The discussion which follows will focus on the regression results for U.S. schools.

Results indicate that the coefficient for AACSB accredited schools (*AACSBACCREDITED*) has a significant and negative relationship with mean faculty age (i.e., AACSB accredited schools have a significantly lower mean faculty age compared to non-AACSB accredited schools), as hypothesized in H_{1a}. This is consistent with our hypothesis that AACSB accredited schools will typically have higher requirements regarding faculty qualifications, including higher requirements for research, tenure, and promotion. Because of these stricter requirements, faculty turnover may be higher for these schools, compared to non-AACSB accredited schools, resulting in the periodic replacement of faculty with newer, and often younger, accounting Ph.D. faculty. Thus, non-AACSB accredited

[2] See Table 1 for a summary of the selection of the 880 unique U.S. schools in the sample.

schools, having a higher mean faculty age, could potentially be impacted more negatively, given that their faculty, on average, are older and closer to retirement age. Other things equal, as time passes and the population of U.S. accounting Ph.D. faculty ages, non-AACSB accredited schools will be impacted more negatively. Such schools should be aware of these implications and plan accordingly when considering their future faculty recruiting needs.

Variables for *ACCTACCREDITED*, *PHDINACCT* and *PERCENTSA* have the hypothesized sign, although are not individually significant in the regression model when regressed against mean age for the accounting Ph.D. faculty for that school. As hypothesized in H_{5a}, the coefficient for public status (*ISPUBLIC*) has a significant and negative relationship with mean faculty age (i.e., public schools have a significantly lower mean faculty age compared to non-public schools). The coefficient for *ENROLLMENT* is also significant; the mean age of accounting Ph.D. faculty is significantly negatively related to school size.

Regression Results Examining Standard Deviation of Faculty Age.

Table 5 presents regression results measuring the hypothesized relationships between the standard deviation of the age of each school's accounting Ph.D. faculty and each of the nine selected school characteristics. For comparative purposes, the regression model was calculated for two sample groups: (1) the full sample of 1,070 schools in the AAA database (described in Table 1), and, (2) the sample of 880 schools located in the U.S. The discussion which follows will focus on the regression results for U.S. schools.

All variables have the hypothesized sign. Coefficients for *PERCNTSA* and *ENROLLMENT* are significant at the .05 level, however none of the other variables are significant for U.S. schools. For the full sample of schools (including non-U.S. schools), coefficients for *AACSBACCREDITED*, *ACCTACCREDITED*, *PHDINACCT*, *ISPUBLIC* are also significant.

Regression Results Examining Percentage of Faculty Over 65 Years of Age.

Finally, regression analysis was used to measure the hypothesized relationship between the percentage of each school's accounting Ph.D. faculty greater than or equal to 65 and each of the nine selected school characteristics described in Section III.[3] Table 6 presents the results of this analysis. Again for comparative

[3] For this analysis, the dependent variable is a proportion ranging from 0 to 1 (i.e., the percentage of each school's accounting Ph.D. faculty greater than or equal to 65). For this analysis, we used a fractional regression model,

purposes, the regression model was calculated for two sample groups: (1) the full sample of 1,070 schools in the AAA database (described in Table 1), and, (2) the sample of 880 schools located in the U.S. The discussion which follows will focus on the regression results for U.S. schools.

Results indicate that coefficients for *AACSBACCREDITED*, *ACCTACCREDITED*, *ISPUBLIC*, *UGONLY*, *ISURBAN*, *TOTALFACULTY* and *ENROLLMENT* all have the hypothesized sign and all are significant at the .05 level. For example, schools that are AACSB accredited have a significantly lower percentage of accounting Ph.D. faculty that are greater than or equal to 65 compared to non-AACSB accredited schools. In addition, for AACSB accredited schools, schools that have additional accounting accreditation have a significantly lower percentage of accounting Ph.D. faculty greater than or equal to 65, compared to their AACSB non-accounting accredited counterparts. Public universities, urban universities, and larger universities in terms of both size of accounting faculty and size of total enrollment also have a lower percentage of accounting Ph.D. faculty greater than or equal to 65.

V. CONCLUSION.

For decades, the accounting profession has expressed concern about a potentially increasing shortage of accounting faculty, especially faculty members with a Ph.D. in Accounting. Concern has particularly been expressed about the effect on this shortage from future accounting faculty retirements. This study has conducted (1) a descriptive analysis of the age distribution of individual faculty members with a Ph.D. in accounting, with a focus on faculty members teaching at U.S. institutions, and, (2) regression analysis examining the relationship between the age of each school's accounting Ph.D. faculty and selected school characteristics.

We have examined three age related variables for each school: (1) the mean age of the school's faculty with Ph.D.s in accounting, (2) the standard deviation in age of the school's faculty with Ph.D.s in accounting, and, (3) the percentage of the school's accounting Ph.D. faculty over 65 years of age. Using data from the American Accounting Association on the current population of accounting faculty teaching accounting, our analysis has provided a current description of the age distribution of faculty with Ph.D.s in accounting. Of particular importance

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which is appropriate when you have a dependent variable that takes values between 0 and 1 and may also be equal to 0 or 1.

is the finding that almost half of all accounting faculty with Ph.D.s in accounting are greater than or equal to age 55, and almost a full fourth are greater than or equal to age 65.

More importantly, we have examined how this age distribution varies across schools and statistically measured the relationship between faculty age and selected school characteristics. In examining the percentage of accounting faculty that are greater than or equal to 65 years of age for each school, we find that schools that will be impacted most negatively by expected retirements are non-AACSB accredited universities, non-public (private) universities, universities that offer undergraduate degrees only, rural and non-urban universities, and smaller universities.

The anticipated growing shortage of accounting Ph.D. faculty continues to be an important area for future research, including the impact that any shortage may have on the academic profession. Our study has provided beginning analysis of this impact. Areas for expanded future research could include (1) continued updates on the current age distributions of accounting Ph.D. faculty, (2) more specific analysis on the age of actual accounting faculty retirements, including research as to why certain accounting faculty continue to teach past normal retirement years, and (3) more detailed analysis of the age distributions of various areas, or fields, of accounting faculty. For example, future research could more specifically examine whether certain areas of accounting faculty (i.e., financial, managerial, tax, auditing, systems, etc.) would be impacted most by upcoming faculty retirements. Results of such research would be helpful in developing plans to help alleviate the negative impact of any existing and continuing accounting faculty shortage.

TABLE 1

Summary of Data Source

Panel A – Summary of Accounting Faculty database: [4]

Number of individual faculty members contained in the AAA database (all degrees, all disciplines):	11,468
Number of individual faculty members teaching in U.S. schools (all degrees, all disciplines):	8,297
Number of unique schools represented:	1,124
Number of unique schools represented with age information available: [2]	1,070
Number of unique schools located in the U.S.:	921
Number of unique schools located in the U.S. with age information available: [5]	880

[4] Source: Accounting Faculty Database maintained by the American Accounting Association ("AAA"). The Database includes, for each faculty member, the faculty member's name, institution name, college and department name, geographic location, academic rank, teaching area, certifications held, highest degree earned, discipline of highest degree, and year of highest degree. For certain individual faculty members, certain variables may have missing information.

[5] Although there were 1,124 unique schools (with 921 located in the U.S.), certain schools might have (a) no faculty members with Ph.D.'s in Accounting, or, (b) faculty members with Ph.D.'s in Accounting, but for whom information was not available to estimate the faculty member's age. The final sample size of 1,070 unique schools (with 880 located in the U.S.) represents the number of schools which have both: (a) one or more faculty members with Ph.D.'s in Accounting, and, (b) information available to compute the faculty member's age.

TABLE 2

Summary of Characteristics of Individual Faculty Members in the Sample

Panel B – Characteristics of Individual Faculty Members:[6]	**# of Faculty**	**Average Age**
Number of individual U.S. Faculty members (all degrees, all disciplines)	7,441	55.539
Number of individual U.S. Faculty members with Ph.D. or DBA in any discipline	5,784	54.063
Number of individual U.S. Faculty members with Ph.D. in any discipline	5,392	53.875
Number of individual U.S. Faculty members with Ph.D. or DBA in Accounting	3,969	55.109
Number of individual U.S. Faculty members with Ph.D. in Accounting	3,685	54.760
Mean Age of U.S. Faculty with Ph.D. in Accounting		54.76
Median Age of U.S. Faculty with Ph.D. in Accounting		54.00
Standard Deviation in Age of U.S. Faculty with Ph.D. in Accounting		12.24
Percentage of U.S. Accounting Ph.D. faculty members with age >= 55		49.36%
Percentage of U.S. Accounting Ph.D. faculty members with age >= 60		35.96%
Percentage of U.S. Accounting Ph.D. faculty members with age >= 65		22.85%
Percentage of U.S. Accounting Ph.D. faculty members with age >= 70		12.70%

[6] Although there were 8,297 individual faculty members teaching in U.S. schools, (Panel A), certain faculty members did not have information available to estimate the faculty member's age. Information contained in Panel B is based on U.S. faculty members for whom information was available to estimate the faculty member's age as of the date the data was obtained from the American Accounting Association. Methodology for estimating faculty age is discussed in Section IV of this paper. At the individual faculty level, this study examines age characteristics of U.S. faculty members with Ph.D.'s in Accounting. Thus, the final sample consists of the 3,685 individual U.S. faculty members with Ph.D.'s in Accounting listed in the AAA database.

TABLE 3

Summary of Characteristics of Individual Schools in the Sample

Panel A – Characteristics of Individual U.S. Schools in the Sample:

Number of unique schools in the sample[7]	880
Number of schools accredited by the AACSB	447
Number of schools with additional AACSB Accounting Accreditation	163
Percentage of schools with mean Accounting Ph.D. Faculty age >= 55	35.45%
Percentage of schools with mean Accounting Ph.D. Faculty age >= 60	15.68%
Percentage of schools with mean Accounting Ph.D. Faculty age >= 65	7.16%
Percentage of schools with mean Accounting Ph.D. Faculty age >= 70	2.39%

Panel B – Correlation Matrix of Independent Variables:

	V01	*V02*	*V03*	*V04*	*V05*	*V06*	*V07*	*V08*	*V09*
V01	1.0000								
V02	0.4693	1.0000							
V03	0.0760	0.1715	1.0000						
V04	0.2534	0.0116	0.0155	1.0000					
V05	0.4043	0.2719	0.2670	0.1096	1.0000				
V06	0.0750	-0.1980	.	0.0839	0.0176	1.0000			
V07	0.4940	0.2632	-0.0217	-0.1124	0.1341	-0.1399	1.0000		
V08	0.1203	0.4303	0.3236	-0.2413	0.0440	-0.2467	0.1899	1.0000	
V09	0.5304	0.5003	0.3994	-0.0006	0.4961	-0.1990	0.2822	0.6052	1.0000

V01 = *AACSBACCREDITED* = 1 if the School has AACSB Accreditation; 0 otherwise
V02 = *ACCTACCREDITED* = 1 if the School has Additional Accounting Accreditation; 0 otherwise
V03 = *PHDINACCT* = 1 if the School offers a Ph.D. in Accounting; 0 otherwise
V04 = *PERCENTSA* = Percentage of Acct. Ph.D. Faculty Classified as Scholarly Academic
V05 = *ISPUBLIC* = 1 if the School is a Public Institution; 0 otherwise
V06 = *UGONLY* = 1 if the School has Undergraduate Students only; 0 otherwise
V07 = *ISURBAN* = 1 if the School is classified as Urban; 0 otherwise
V08 = *TOTALFACULTY* = Log of the total number of faculty in the Accounting Department/Unit
V09 = *ENROLLMENT* = Log of Total Full Time Student Enrollment

[7] See Table 1 for a discussion of the selection of the 880 unique U.S. schools in the sample.

TABLE 4

Regression Results Examining the Relationship Between the Mean Age of a School's Accounting Ph.D. Faculty and Selected School Characteristics

Variable	Predicted Sign	For the Sample of 1,070 Schools in the AAA Database [8] Coefficient	t-value	P>|t|	For the Sample of 880 Schools Located in the U.S. [9] Coefficient	t-value	P>|t|
AACSBACCREDITED	-	-1.5506	-3.03	0.002*	-1.6086	-2.72	0.007*
ACCTACCREDITED	-	-.8902	-1.46	0.145	-1.1856	-1.84	0.067
PHDINACCT	-	-.3751	-0.37	0.713	-.3012	-0.28	0.783
PERCENTSA	-	-1.3705	-0.78	0.434	-1.8148	-0.92	0.360
ISPUBLIC	-	-1.3351	-2.68	0.008*	-1.4795	-2.60	0.010*
UGONLY	+	.9764	0.79	0.431	.8407	0.67	0.503
ISURBAN	-	-.4137	-0.77	0.443	-.1506	-0.25	0.804
TOTALFACULTY	-	-.6798	-1.81	0.071	-.6690	-1.60	0.110
ENROLLMENT	-	-.7331	-2.23	0.026*	-.7331	-2.23	0.026*

MEAN AGE = $\beta_0 + \beta n$ (*Variable*)

where:

MEAN AGE	=	Mean Age of the School's Accounting Faculty with Ph.D.s in Accounting
AACSBACCREDITED	=	1 if the School has AACSB Accreditation; 0 otherwise
ACCTACCREDITED	=	1 if the School has Additional Accounting Accreditation; 0 otherwise
PHDINACCT	=	1 if the School offers a Ph.D. in Accounting; 0 otherwise
PERCENTSA	=	Percentage of Accounting Ph.D. Faculty Classified as Scholarly Academic
ISPUBLIC	=	1 if the School is a Public Institution; 0 otherwise
UGONLY	=	1 if the School has Undergraduate Students only; 0 otherwise
ISURBAN	=	1 if the School is classified as Urban; 0 otherwise
TOTALFACULTY	=	Log of the total number of faculty in the Accounting Department/Unit
ENROLLMENT	=	Log of Total Full Time Student Enrollment

[8] Regression results based on the 1,070 unique schools identified in Table 1.

[9] Regression results based on the 880 unique U.S. schools identified in Table 1.

* Significant at the .05 level.

TABLE 5

Regression Results Examining the Relationship Between the Standard Deviation in Age of a School's Accounting Ph.D. Faculty and Selected School Characteristics

Variable	Predicted Sign	For the Sample of 1,070 Schools in the AAA Database [10] Coefficient	t-value	P>|t|	For the Sample of 880 Schools Located in the U.S. [11] Coefficient	t-value	P>|t|
AACSBACCREDITED	+	1.2006	2.45	0.015*	.3414	0.57	0.572
ACCTACCREDITED	+	1.4437	2.62	0.009*	.6840	1.18	0.240
PHDINACCT	+	2.8383	2.61	0.011*	1.3236	1.20	0.236
PERCENTSA	+	1.8233	1.08	0.282	3.6997	1.99	0.048*
ISPUBLIC	+	1.2202	2.68	0.008*	.3766	0.71	0.480
UGONLY	-	-.0859	-0.07	0.946	-.5425	-0.43	0.668
ISURBAN	+	.4097	0.85	0.396	.1839	0.35	0.730
TOTALFACULTY	+	-.1909	-0.51	0.611	.5459	1.30	0.194
ENROLLMENT	+	1.0161	3.25	0.001*	1.0161	3.25	0.001*

MEAN AGE = $\beta_0 + \beta n$ (*Variable*)

where:

MEAN AGE	=	Mean Age of the School's Accounting Faculty with Ph.D.s in Accounting
AACSBACCREDITED	=	1 if the School has AACSB Accreditation; 0 otherwise
ACCTACCREDITED	=	1 if the School has Additional Accounting Accreditation; 0 otherwise
PHDINACCT	=	1 if the School offers a Ph.D. in Accounting; 0 otherwise
PERCENTSA	=	Percentage of Accounting Ph.D. Faculty Classified as Scholarly Academic
ISPUBLIC	=	1 if the School is a Public Institution; 0 otherwise
UGONLY	=	1 if the School has Undergraduate Students only; 0 otherwise
ISURBAN	=	1 if the School is classified as Urban; 0 otherwise
TOTALFACULTY	=	Log of the total number of faculty in the Accounting Department/Unit
ENROLLMENT	=	Log of Total Full Time Student Enrollment

[10] Regression results based on the 1,070 unique schools identified in Table 1.

[11] Regression results based on the 880 unique U.S. schools identified in Table 1.

* Significant at the .05 level.

TABLE 6

Regression Results Examining the Relationship Between the Percentage of a School's Accounting Ph.D. Faculty Over 65 and Selected School Characteristics

Variable	Predicted Sign	For the Sample of 1,070 Schools in the AAA Database [12] Coefficient	t-value	P>|t|	For the Sample of 880 Schools Located in the U.S. [13] Coefficient	t-value	P>|t|
AACSBACCREDITED	-	-.3804	-4.13	0.000*	-.4770	-4.50	0.000*
ACCTACCREDITED	-	-.4333	-5.76	0.000*	-.4898	-6.16	0.000*
PHDINACCT	-	-.0898	-0.68	0.499	-.1424	-0.98	0.327
PERCENTSA	-	.2851	1.04	0.299	.4783	1.56	0.118
ISPUBLIC	-	-.2855	-3.35	0.001*	-.3107	-3.24	0.001*
UGONLY	+	.4141	2.40	0.016*	.3869	2.23	0.026*
ISURBAN	-	-.1852	-2.25	0.024*	-.1702	-1.96	0.050*
TOTALFACULTY	-	-.4112	-6.23	0.000*	-.4103	-6.03	0.000*
ENROLLMENT	-	-.3766	-6.24	0.000*	-.3766	-6.24	0.000*

MEAN AGE = $\beta_0 + \beta n$ (*Variable*)

where:

MEAN AGE	=	Mean Age of the School's Accounting Faculty with Ph.D.s in Accounting
AACSBACCREDITED	=	1 if the School has AACSB Accreditation; 0 otherwise
ACCTACCREDITED	=	1 if the School has Additional Accounting Accreditation; 0 otherwise
PHDINACCT	=	1 if the School offers a Ph.D. in Accounting; 0 otherwise
PERCENTSA	=	Percentage of Accounting Ph.D. Faculty Classified as Scholarly Academic
ISPUBLIC	=	1 if the School is a Public Institution; 0 otherwise
UGONLY	=	1 if the School has Undergraduate Students only; 0 otherwise
ISURBAN	=	1 if the School is classified as Urban; 0 otherwise
TOTALFACULTY	=	Log of the total number of faculty in the Accounting Department/Unit
ENROLLMENT	=	Log of Total Full Time Student Enrollment

[12] Regression results based on the 1,070 unique schools identified in Table 1.

[13] Regression results based on the 880 unique U.S. schools identified in Table 1.

* Significant at the .05 level.

TABLE 7

Hypotheses Related to a School's Standard Deviation of Faculty Age

H_{1b}: AACSB accredited schools will have a significantly higher standard deviation of faculty age than non-AACSB accredited schools. (There will be a positive relationship between standard deviation of faculty age and the school's AACSB accreditation status).

H_{2b}: Schools with additional AACSB accounting accreditation will have a significantly higher standard deviation of faculty age than schools without additional AACSB accounting accreditation. (There will be a positive relationship between standard deviation of faculty age and the school's additional accounting accreditation status).

H_{3b}: Schools that offer a Ph.D. in accounting will have a significantly higher standard deviation of faculty age than schools without a Ph.D. in accounting program. (There will be a positive relationship between standard deviation of faculty age and the school's offering of a Ph.D. program in accounting).

H_{4b}: Schools with a higher percentage of "scholarly academic" faculty will have a significantly higher standard deviation of faculty age than schools with a lower percentage of "scholarly academic" faculty. (There will be a positive relationship between standard deviation of faculty age and the school's percentage of accounting faculty classified as "scholarly academic).

H_{5b}: Public universities will have a significantly higher standard deviation of faculty age than non-public universities. (There will be a positive relationship between standard deviation of faculty age and the school's public status).

H_{6b}: Schools that offer undergraduate programs only will have a significantly lower standard deviation of faculty age than schools that also offer higher level graduate programs. (There will be a negative relationship between standard deviation of faculty age and the school's offering of undergraduate programs only).

H_{7b}: Schools that are classified as urban will have a significantly higher standard deviation of faculty age than schools that are classified as non-urban. (There will be a positive relationship between standard deviation of faculty age and the school's classification as urban).

H_{8b}: Schools that have a larger total number of accounting faculty will have a significantly higher standard deviation of faculty age than schools that have a smaller number of faculty. (There will be a positive relationship between standard deviation of faculty age and the size of the school's accounting faculty).

H_{9b}: Schools that have a larger total number of full-time students will have a significantly higher standard deviation of faculty age than schools that have a smaller number of full-time students. (There will be a positive relationship between standard deviation of faculty age and the size of the school's student enrollment).

TABLE 8

Hypotheses Related to a School's Percentage of Accounting Ph.D. Faculty Greater than or Equal to 65 Years of Age

H_{1c}: AACSB accredited schools will have a significantly lower percentage of accounting Ph.D. faculty greater than or equal to 65 than non-AACSB accredited schools. (There will be a negative relationship between the percentage of accounting Ph.D. faculty greater than or equal to 65 and the school's AACSB accreditation status).

H_{2c}: Schools with additional AACSB accounting accreditation will have a significantly lower percentage of accounting Ph.D. faculty greater than or equal to 65 than schools without additional AACSB accounting accreditation. (There will be a negative relationship between the percentage of accounting Ph.D. faculty greater than or equal to 65 and the school's additional accounting accreditation status).

H_{3c}: Schools that offer a Ph.D. in accounting will have a significantly lower percentage of accounting Ph.D. faculty greater than or equal to 65 than schools without a Ph.D. in accounting program. (There will be a negative relationship between the percentage of accounting Ph.D. faculty greater than or equal to 65 and the school's offering of a Ph.D. program in accounting).

H_{4c}: Schools with a higher percentage of "scholarly academic" faculty will have a significantly lower percentage of accounting Ph.D. faculty greater than or equal to 65 than schools with a lower percentage of "scholarly academic" faculty. (There will be a negative relationship between the percentage of accounting Ph.D. faculty greater than or equal to 65 and the school's percentage of accounting faculty classified as "scholarly academic).

H_{5c}: Public universities will have a significantly lower percentage of accounting Ph.D. faculty greater than or equal to 65 than non-public universities. (There will be a negative relationship between the percentage of accounting Ph.D. faculty greater than or equal to 65 and the school's public status).

H_{6c}: Schools that offer undergraduate programs only will have a significantly higher percentage of accounting Ph.D. faculty greater than or equal to 65 than schools that also offer higher level graduate programs. (There will be a positive relationship between the percentage of accounting Ph.D. faculty greater than or equal to 65 and the school's offering of undergraduate programs only).

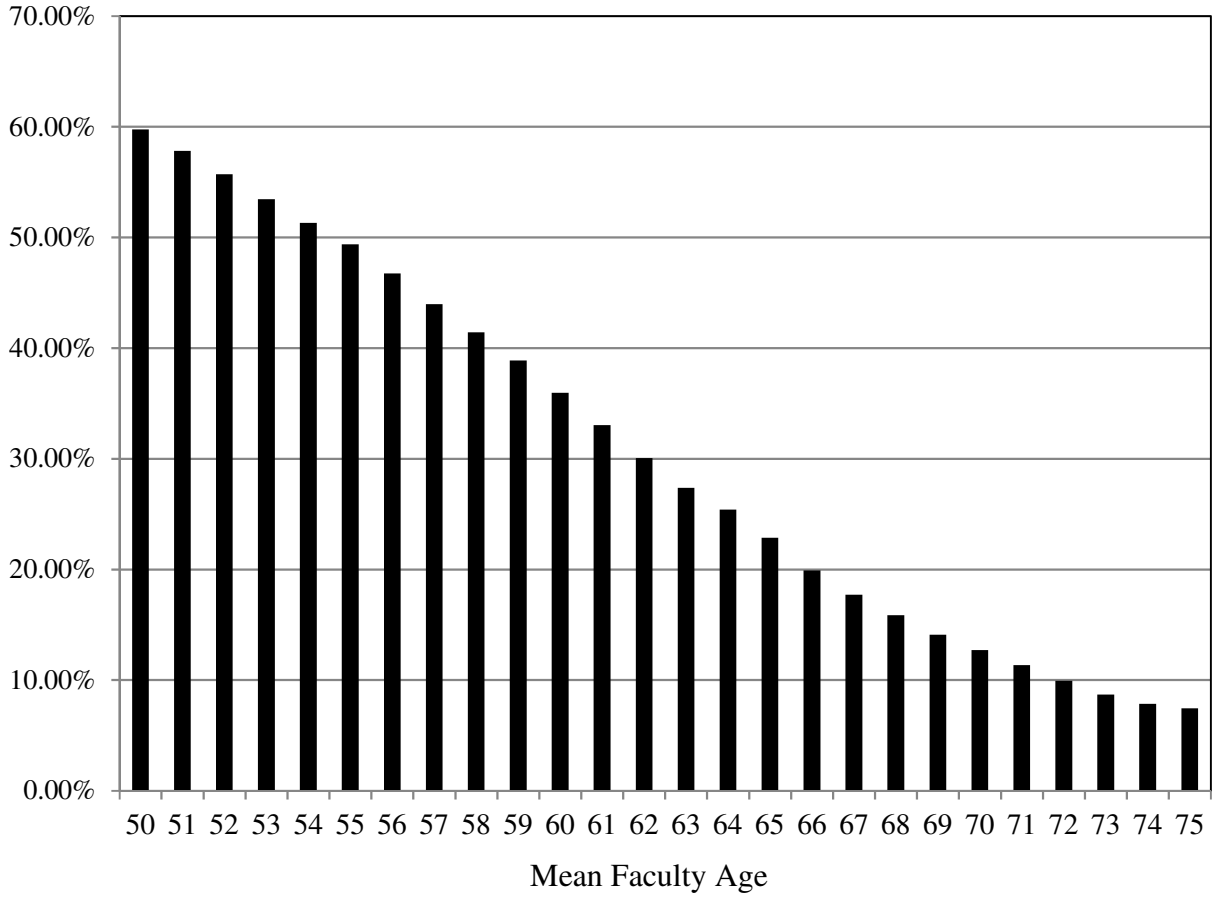
H_{7c}: Schools that are classified as urban will have a significantly lower percentage of accounting Ph.D. faculty greater than or equal to 65 than schools that are classified as non-urban. (There will be a negative relationship between the percentage of accounting Ph.D. faculty greater than or equal to 65 and the school's classification as urban).

H_{8c}: Schools that have a larger total number of accounting faculty will have a significantly lower percentage of accounting Ph.D. faculty greater than or equal to 65 than schools that have a smaller number of faculty. (There will be a negative relationship between the percentage of accounting Ph.D. faculty greater than or equal to 65 and the size of the school's accounting faculty).

H_{9c}: Schools that have a larger total number of full-time students will have a significantly lower percentage of accounting Ph.D. faculty greater than or equal to 65 than schools that have a smaller number of full-time students. (There will be a negative relationship between the percentage of accounting Ph.D. faculty greater than or equal to 65 and the size of the school's student enrollment).

FIGURE 1

Percentage of U.S. Faculty Members with Ph.D.s in Accounting that are Greater Than or Equal to the Age of "X" [14]



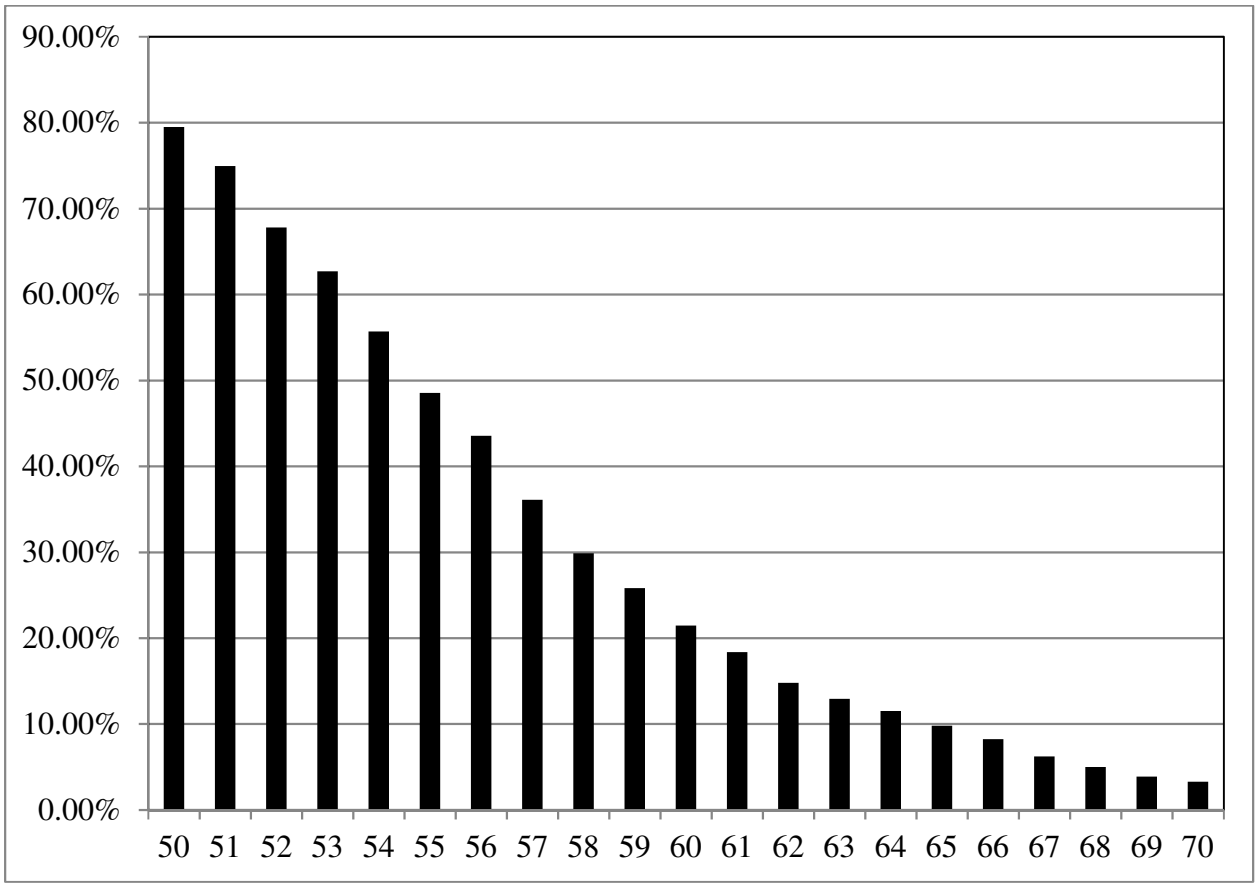
Data Values:

Age	Percent	Age	Percent	Age	Percent
50	59.76%	59	38.86%	68	15.85%
51	57.80%	60	35.96%	69	14.08%
52	55.71%	61	33.03%	70	12.70%
53	53.43%	62	30.04%	71	11.34%
54	51.32%	63	27.35%	72	9.93%
55	49.36%	64	25.40%	73	8.68%
56	46.73%	65	22.85%	74	7.84%
57	43.96%	66	19.89%	75	7.44%
58	41.41%	67	17.69%		

[14] Percentages are based on the sample of 3,685 individual faculty members identified in Table 1.

FIGURE 2

Percentage of Schools with Mean Age of Accounting Ph.D. Faculty Greater Than or Equal to the Age of "X" [15]



Data Values:

Age	Percent	Age	Percent	Age	Percent
50	79.47%	57	36.08%	64	11.51%
51	74.96%	58	29.86%	65	9.80%
52	67.81%	59	25.82%	66	8.24%
53	62.67%	60	21.46%	67	6.22%
54	55.68%	61	18.35%	68	4.98%
55	48.52%	62	14.77%	69	3.89%
56	43.55%	63	12.91%	70	3.27%

[15] Percentages are based on the sample of 880 individual schools identified in Table 1 for which mean faculty age information is available.

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