Does Earning a Graduate Degree Impact CPA Exam Performance?

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ABSTRACT

Because of the tuition costs, the delay in beginning careers, and the potential alternative methods of satisfying the requirements for CPA licensure, graduate accounting programs are facing the challenge of stagnant enrollments.

This study investigates the difference in the performance on the Uniform CPA Exam among those candidates having completed a graduate degree and those possessing only an undergraduate degree. Candidates are required to complete 150 credit hours of course study prior to becoming a CPA, but there are numerous paths to satisfy that requirement. While Boone et al. (2006) claim that advanced degree holding candidates can be expected to have higher exam pass rates as a result of completing additional accounting courses, the potential benefit of the degree may not be worth the price of tuition.

The onerous cost of higher education combined with sufficient latitude in state requirements for completing the additional thirty credit hours beyond a traditional baccalaureate degree has contributed to accounting students pursuing paths other than graduate study to satisfy the 150-credit hour requirement for CPA licensure. In many cases, the highest ranking accounting students, those would have typically entered into a master's program, are completing the 150 hour requirement through the normal 4 year undergraduate program, often taking courses not related to accounting at all.

Prior studies examining the relation between exam pass rates and earned advanced degrees [Grant, Ciccotello, and Dickie (2002) and Boone et al. (2006)] used information collected from outdated paper-based examinations given twice a year. In 2004, testing and students' test-taking strategies were dramatically changed with the implementation of the computer-based exam which could be attempted one section at a time and taken up to eight times per year.

In the current study, we analyze exam results for 2013 and 2014 from the respective editions of the National Association of State Boards of Accountancy's (NASBA)

Uniform CPA Examination Candidate Performance Book. Our findings and resulting interpretations *are based on the version of the AICPA's Content and Skill Specifications for the Uniform CPA Examination which took effect January 1, 2013.*

Results from this study indicating graduate degree holders perform better on the exam than those who only have an undergraduate degree could be an asset in attracting students to graduate accounting programs. Alternatively, should the data not indicate the worth of the graduate degree, graduate accounting faculty will have to re-evaluate their programs and make appropriate changes to justify the costs.

Introduction

With Colorado's re-adoption of the 150-hour requirement in July of 2015, all fifty states, as well as the District of Columbia and Puerto Rico, now require 150 hours of education to become a CPA. Two distinct paths to satisfying this requirement have emerged since its implementation: complete the incremental thirty credits with additional undergraduate coursework or complete a graduate degree. Given the completion of a graduate degree is typically the more costly alternative, its incremental benefits must outweigh its incremental costs in order for it to be a cost-effective choice. While completing a graduate degree has many potential benefits, a typical post-graduation goal for accounting students is to pass the exam as quickly as possible. Therefore, our study investigates whether candidates who have completed a graduate degree to satisfy the 150-credit hour licensing requirement perform better on the Uniform CPA Exam (hereafter, the exam) compared to candidates who only completed an undergraduate degree.

The cost of higher education has continued to spiral over the past decade. According to data reported by the U.S. Department of Education (2016), the cost of tuition, fees, room and board for undergraduate students at 4-year institutions has increased by more than 40% since 2006. Accounting students who want to pursue a CPA are especially hard-hit by the 150-credit hour requirement. Given that no state requires a graduate degree to fulfill the requirement, it is not surprising that many accounting students are opting for the lower-cost undergraduate alternative. Indeed, a recent analysis conducted by the authors at their institution found that of the top one-third of a typical graduating class, a majority completes the 150-credit hour requirement by completing all undergraduate courses.

The purpose of the 150-credit hour requirement is to better prepare students to enter the accounting profession (Shafer and Kunkel 2001, Grant et al., 2002). An interesting question that arises is whether one path to 150 hours is superior to the other? With the high cost of education coupled with the need to pass the exam, understanding whether one education path significantly enhances performance on the exam would be very useful to those in the academic community. Relative exam performance would be particularly useful information for students as they develop a plan to satisfy the 150-hour requirement. Given students seek the advice of accounting faculty and academic advisors as they develop their education plan, our findings will be useful in this advisory capacity.

The remainder of the paper is organized as follows: in the next section we present the background and literature review and develop the hypotheses. Next, we describe our methodology and present our results. Finally, we discuss our results, limitations and offer possible avenues for future research.

Background

The complexity of the business world and accounting for business transactions has grown significantly over the past several decades. Influenced by this changing landscape, the 150-credit hour requirement was introduced in an attempt to better prepare students to enter the accounting profession. Proponents of the 150-hour requirement argue that the additional education enhances the quality of accounting students and better prepares them for the CPA exam (Allen and Woodland 2006).

Starting with Florida in 1983, states and jurisdictions have gradually adopted the requirement that candidates complete 150 credit hours for CPA licensing. Colorado's adoption of the 150-hour requirement in 2015 leaves the Virgin Islands as the only jurisdiction that still requires just 120 credit hours to become a CPA. Between 1983 and today, two distinct paths to fulfilling the 150-hour requirement have emerged: complete additional undergraduate coursework or complete a graduate degree.

Undergraduate Path to 150

Students who opt to fulfill the 150-hour requirement by taking additional undergraduate courses may complete an additional major and/or take classes at a local community college. One of the primary cost savings that result from this option arises from lower tuition costs given undergraduate credits usually cost less than graduate credits. In addition, many schools offer flat-rate tuition which enables students to complete up to 18 or 21 credits per semester for the same fixed rate. By completing more than 15 credits per semester, these students will finish 150 hours in less than five years reducing tuition costs even further. Furthermore, these students avoid the opportunity cost of postponing their salary until after five years of education.

Despite its cost advantages, students may not be fully aware of potential disadvantages to completing 150 undergraduate credits. By double-majoring or taking classes at a community college, students are registering for additional courses that are likely not accounting-related nor do they encompass material specified in the AICPA's *Content and Skill Specifications for the Uniform CPA Examination.* As noted above, with flat-rate tuition, many of these students complete the additional credits within the same four-year period that they are completing their accounting undergraduate degree requirements. While many students will increase their out-of-class preparation time due to their heavy academic schedule, they may not do so proportionally given the fixed amount of time that they can devote to their academic study. In short, the time and effort necessary for the additional coursework may reduce the time spent on their accounting coursework. As a result, students who complete 150 credits in just four years may be entering the profession less prepared than their predecessors who were CPA ready in four years with just 120 credit hours.

Graduate Path to 150

As the 150-credit hour requirement was becoming a reality, many expected that the fifth year would enhance accounting education by broadening what was thought to be a narrow undergraduate education by integrating additional professional training at the graduate level (Shafer and Kunkel 2001). Graduate accounting programs provide educators with the opportunity to incorporate a broader and more challenging set of topics into their curricula to better prepare graduates for the challenges of the profession. Graduate study provides future accountants with the opportunity to further refine their critical skills that are in high demand in the profession today. This very sentiment is expressed by the AICPA:

"In most cases, the additional academic work needed to acquire the technical competence and develop the skills required by today's CPA is best obtained at the graduate level. Graduate-level programs are an excellent way to more fully develop skills such as communication, presentation, and interpersonal relations, and to integrate them with the technical knowledge being acquired." (AICPA n.d.)

Ironically, even though graduate programs are well suited to address the deficiencies that were the catalyst for the 150-hour legislation, neither a graduate degree nor the completion of graduate level classes is required for licensing as a CPA.

One distinct advantage of the graduate alternative is that students complete additional accounting courses which better equip them for success on the exam. The growing body of knowledge covered by the exam has resulted in gaps in content coverage by undergraduate curriculums. Graduate programs enable schools to fill these gaps and provide students with direct instruction on some of accounting's more sophisticated topics. Thus, students who opt for this route should be more technically proficient on a broader scope of exam topics than those who pursue the undergraduate route.

Another advantage of the graduate path is that it allows for a more time-managed learning experience for students. Completing 150 hours in five years affords students more out-of-class preparation time for each credit attempted; time that is critical to fully synthesize and process information necessary to cement a deeper understanding of complex topics.

Finally, there are career advancement benefits to having earned a graduate degree. In their study focusing on accountants in private industry, Hunton and Wier (2015) provide evidence that individuals with graduate degrees are more likely to be promoted to senior level positions than those with bachelor's degrees. More recently, Brink, Norman and Wier (2016) found that the level of education completed is a significant predictor of promotion probabilities in Big 4 accounting firms.

Despite the aforementioned advantages of completing a graduate degree, many accounting students are choosing to become CPA-ready by completing additional undergraduate credits. With the rising cost of higher education, the decision is likely rooted in a cost-benefit framework. Unfortunately, many students (and academics) may not fully understand the relative costs and

benefits of the education alternatives. In our study, we focus on one of the potential benefits of graduate study, superior performance on the CPA exam.

Literature Review and Hypothesis Development

There has been ample research investigating the association between additional education (150 credit hours) and CPA exam performance. With the enactment of the 150-hour legislation across jurisdictions over a prolonged period of time, the environment was conducive for comparing exam performance before and after the adoption of 150 hours. Cumming and Rankin (1999) examined pass rates in Florida before and after the state instituted the 150-hour requirement and found a significant increase in the pass rates after the 150-hour requirement was adopted. Raghunandan et al. (2003) found that exam performance was higher for candidates who had completed 150 credit hours after controlling for SAT scores, review courses, and number of accounting credits. Similarly, Read et al. (2001) found that while only 13% of candidates with less than 150 credits passed the exam on the first attempt, nearly 21% passed when they had completed 150 credit hours of education. Gramling and Rosman (2009) compared pass rates between states that required candidates to have 150 credits to sit for the exam (150 states) compared to states that required only 120 credits to sit for the exam and 150 hours for licensure (120/150 states). Gramling and Rosman found that candidate performance from 150 states increased by 8.6% when those states adopted the 150-hour requirement while performance for 120/150 states only increased by 3.8% when the 150-hour requirement was implemented.

While the aforementioned studies found a positive relationship between 150 hours of education and exam performance, others questioned the underlying cause of the increase in performance as well as the significance of the increase. Grant et al. (2002) found that the difference in exam performance is attributable to reasons other than the additional education, such as scholastic aptitude and CPA review courses. Grant et al. concluded that the increased education requirements were an inefficient means to increasing exam performance. Similarly, while Allen and Woodland (2006) found an average increase in pass rates of 7.9%, they warn that given the pass rates started in the low to mid 20's the percentage point increase due to 150 hours was quite small.

The mixed results regarding the relationship between exam performance and the 150-hour requirement may be due to focusing on an increase in education as opposed to the type of education completed. In other words, these prior studies did not specifically attribute performance differences to graduate versus undergraduate education. Given nearly all jurisdictions now require 150 hours, understanding the impact of the different paths to 150 is more relevant to students and academics. An early study that did look directly at the impact of graduate study on pass rates was Titard and Russell (1989). They did find that a graduate degree had a positive impact on the performance of all parts of the exam.

While the results of Titard and Russell are relevant to the current study, they are based on data from when the exam was paper-based and administered just twice per year. The current version of the exam, which was implemented in 2004, is computer-based. This format enables the exam to be administered over eight months of the year. In addition, candidates are able to complete just one section at a time. Previously, it was necessary to pass multiple sections of the exam for a

candidate to accrue credit on any part of the exam. These fundamental changes to the exam have likely caused candidates' test-taking strategies to change and may have changed the relationship between exam performance and level of education.

Using data from the computerized exam, Dunn and Hooks (2009) studied the relationship between pass rates with the cost of education and whether or not candidates completed a graduate degree. While Dunn and Hooks found that having a graduate degree is associated with higher performance on the CPA exam, they only found limited differences in performance based on cost of education. Although Dunn and Hooks did find an association between the completion of a graduate degree and exam performance, they did not control for other factors that prior research has found to also impact exam performance (e.g. Grant et al., 2002; Raghunandan et al., 2003). Briggs and He (2012) also utilized data from the computerized exam and report that jurisdictions that require 150 hours to sit for the exam have significantly higher pass rates, but only on the Auditing and Regulation sections of the exam. While encouraging, Briggs and He did not directly look at the effects of graduate education on exam performance.

Given these prior studies, it is difficult to discern whether or not a graduate education has a positive impact on exam performance in the current testing format. We argue that students who fulfill 150 hours with a graduate degree will have a more time-managed learning experience (i.e. five years versus just four) and more in-depth instruction on a broader array of exam topics. As a result, we expect that candidates with a graduate degree will outperform candidates with only a bachelor's degree. Therefore, we propose the following hypothesis:

H1: CPA candidates with a graduate degree will outperform candidates with just an undergraduate degrees.

In order to be sure that performance differences between graduate and undergraduate students are attributable to differences in their educational experiences, we also examined other factors that prior research has found to be associated with CPA exam performance. For instance, Grant et al. (2002) found that candidate aptitude, as measured by college entrance exams, is positively associated with CPA exam performance. Nouri and Miller (2015) also found a school's reported average SAT score to be associated with CPA exam performance. Similarly, Boone et al. (2006) observe that candidates graduating from more selective schools perform at a higher level on the CPA exam. We extend these studies by examining whether performance on standardized entrance exams for both undergraduate and graduate degree candidates is positively associated with CPA exam performance. Therefore, we propose the following hypothesis:

H2: CPA exam performance is higher for candidates obtaining degrees from educational institutions with more selective admission criteria as measured by the SAT and GMAT.

Another factor that may be positively associated with CPA exam performance is accreditation type. On its website, the American Assembly for Collegiate Schools of Business (AACSB) touts its member schools as having better programs, faculty, and students as compared to non-accredited institutions (AACSB n.d.). One way that this quality differential might reveal itself is if graduates from schools with AACSB business accreditation outperform graduates from non-accredited

schools on the exam. In addition, graduates from schools with separate AACSB accounting accreditation may outperform graduates from both AACSB business accredited and non-accredited schools.

Earlier studies using data from the pencil and paper CPA exam have reported an association between accreditation and CPA exam performance (Marts et al. 1988; Grant et al. 2002; Howell and Heshizer 2006; and Barilla et al. 2008). Using data from the computerized format, Nouri and Miller (2015) recently found that candidates with undergraduate degrees from accounting-accredited schools outperformed candidates from business-accredited schools. Likewise, candidates with undergraduate degrees from business-accredited schools outperformed candidates from unaccredited schools. We extend Nouri and Miller by examining whether these effects are present for undergraduate and graduate students. Therefore, we propose the following hypotheses:

H_3: CPA exam performance is better for candidates holding a degree (graduate and/or undergraduate) from an AACSB business accredited institution than for candidates holding a degree from a non-AACSB business accredited institution.

H_4: CPA exam performance is better for candidates holding a degree (graduate and/or undergraduate) from an AACSB accounting accredited institution than for candidates holding a degree from an AACSB business accredited institution.

Method

Sample

Our sample includes data published in NASBA's *Candidate Performance on the Uniform CPA Examination* for 2013 and 2014. The subset of schools included in our sample offer candidates the alternative of completing 150 hours through earning a graduate degree or by completing only undergraduate courses. While this limits the schools in our sample, we feel it is necessary to best capture our primary research question: *Is it better to fulfill the 150-hour requirement by obtaining a graduate degree or by completing additional undergraduate classes?* Given the schools in our sample offer both graduate and undergraduate alternatives to 150, they are more likely to have a plan for comprehensive coverage of exam topics compared to schools offering only undergraduate coursework. In addition, we focused on 2013 and 2014 due to the AICPA's update of their *Content and Skill Specifications for the Uniform CPA Examination* that took effect January 1, 2013. Thus, our data is based on the current AICPA specifications.

We use reported standardized test data (SAT or ACT for undergraduate programs and GMAT for graduate programs) to control for a program's admission selectivity quality. Schools for which standardized test data could not be obtained were eliminated from the sample we used in our main analysis. As shown in Table 1, CPA Exam performance data on all testing events for undergraduate and graduate degree candidates was reported for 842 schools, resulting in 1,684 observations for 2013 and 2014. Standardized test data was not reported for 76 of the undergraduate observations and 280 graduate observations, resulting in 1,328 observations in our sample.

Table 1: Sample

	2013	2014	Total Observations*
Schools for which CPA exam performance data is reported for bachelor's and advanced degrees	430	412	1,684
Observations without reported SAT or ACT data			(76)
Observations without reported GMAT data			(280)
Observations included in analysis			1,328

Models and Variables

Regression analysis is used to test our hypotheses of whether completing a graduate degree impacts CPA exam performance. We used two measures of exam performance: pass rate and average score. The following models were estimated:

$$PASS\% = \alpha + \beta_1 GRAD + \beta_3 SELECT + \beta_4 BACC + \beta_5 AACC + \varepsilon \quad (1)$$

$$AVGSC = \alpha + \beta_1 GRAD + \beta_3 SELECT + \beta_4 BACC + \beta_5 AACC + \varepsilon \quad (2)$$

where:

$PASS\%_{ij}$ = CPA exam pass rate for all testing events for school *i*, in year *j*;

$AVGSC_{ij}$ = average CPA exam score for all testing events for school *i*, in year *j*;

GRAD = 1 if dependent variable is a graduate observation (based on Advanced Degree results) and 0 otherwise;

$SELECT_i$ = scaled standardized test score for school *i*

BACC = 1 if school has AACSB business accreditation, 0 otherwise;

AACC = 1 if school has AACSB accounting accreditation, 0 otherwise;

Accounting and business accreditation data was obtained from the AACSB website. GMAT scores for schools reporting graduate degree results were obtained from the Princeton Review's *The Best 296 Business Schools.* For schools for which a GMAT score was not reported in the Princeton Review, the mean GMAT score was retrieved from the *U.S. News and World Report* (2016) website (http://premium.usnews.com/best-colleges). We obtained SAT and ACT data for schools reporting undergraduate degree results from the *U.S. News and World Report* (2016) website.

We encountered two issues with the standardized test scores. First, while many schools reported both SAT and ACT data, several reported one but not the other. To avoid eliminating schools that

did not provide an SAT score from our sample, we converted the reported ACT score to an equivalent SAT score based on an equation estimated from our sample schools with both measures (estimated SAT = 201 + 38*ACT). Second, we need a single admission selectivity variable (SELECT) applicable to both graduate and undergraduate programs. Our SAT and GMAT data are not comparable given the difference in scaling for each exam. In addition, the reported GMAT data is the mean score while the reported SAT data is the 75th percentile score. To compensate for these differences, we standardized each school's score by the mean score for that exam (SAT or GMAT) for schools in our sample. For our sample schools, the mean 75th percentile SAT score, 1,210, was used to standardize each reporting institution's SAT score. The mean GMAT score of 566 was then used to standardize each reporting institution's GMAT score.

Results

Descriptive statistics for the exam performance-related variables for the schools in our sample are reported in Table 2. These statistics include the mean, standard deviation, and number of observations for the dependent and independent variables examined (see Panel A). On average, 42.4% of the candidates in our sample completed graduate degrees. 89.7% of the institutions included had AACSB business school accreditation while only 44.8% had accounting accreditation. Finally, school selectivity indicated that on average the admittance to schools measured at an average score that was merely 1.4% higher than the average admittance score for all schools reporting standardized test results (GMAT/SAT/ACT). The variance away from the mean is due to the manipulation of scores to create a uniform measure for ACT and SAT results. This 1.4% variance away from the mean was not found to be significant.

Table 2 also reports the descriptive statistics for the dependent variables by degree type (Panel B) and by level of accreditation (Panel C). Exam performance, as measured by both PASS% and AVGSC, is better for advanced degree observations than for bachelor's degree observations. In addition, PASS% and AVGSC are best for programs with AACSB Accounting accreditation, followed by programs with AACSB Business accreditation. Schools without either of these accreditations exhibited the weakest exam performance.

Table 2: Descriptive Statistics

Panel A: Overall Sample

Variable	Mean	Std Dev	n
PASS%	50.49%	0.141	1,328
AVGSC	72.24	4.597	1,328
GRAD	0.424	0.494	1,328
SELECT	1.014	0.113	1,328
BACC	0.897	0.304	1,328
AACC	0.448	0.498	1,328

Panel B: By Degree Type

Variable	Mean	Std Dev	n
PASS% - Advanced	54.12%	0.147	562
PASS% - Bachelor's	47.86%	0.131	766
AVGSC - Advanced	73.41	4.503	562
AVGSC – Bachelor's	71.40	4.398	766

Panel C: By Level of Accreditation

Variable	Mean	Std Dev	n
PASS% - AACSB Accounting	54.96%	0.119	576
PASS% - AACSB Business	49.20%	0.146	602
PASS% - No accreditation	38.51%	0.120	150
AVGSC - AACSB Accounting	73.81	3.619	576
AVGSC – AACSB Business	71.78	4.675	602
AVGSC – No accreditation	68.00	4.577	150

We calculated Pearson's r correlations and Spearman's rho to evaluate the association between each of the independent and dependent variables. These tests allow for both parametric and non-parametric measurements to be established for the variables. These results are presented in Table 4. Additionally, the Tolerance measure has been included for each of the independent variables to ensure that multi-collinearity is not an issue with the analyzed data. The results of each of these tests indicate that while the data is significantly related there are no results that indicate concern about the levels of collinearity or multi-collinearity.

Table 3: Reliability and Correlations

Variable	1	2	3	4	5	6
1. PASS%		0.913	0.218	0.282	0.256	0.512
		0.000	0.000	0.000	0.000	0.000
2. AVGSC	0.926		0.213	0.295	0.273	0.525
	0.000		0.000	0.000	0.000	0.000
3. GRAD	0.223	0.240	**0.895**	0.281	0.116	-0.104
	0.000	0.000		0.000	0.000	0.000
4. SELECT	0.501	0.504	-.1000	**0.936**	0.184	0.161
	0.000	0.000	0.000		0.000	0.000
5. BACC	0.287	0.293	0.281	0.172	**0.819**	0.306
	0.000	0.000	0.000	0.000		0.000
6. AACC	0.265	0.277	0.116	0.139	0.306	**0.897**
	0.000	0.000	0.000	0.000	0.000	

Note: Data on the diagonal represent the Tolerance measure for each independent variable. Data above the diagonal are Pearson coefficient. Data below the diagonal are Spearman's coefficient.

As stated earlier, regression analysis was used to assess the relationship between the dependent variables (PASS% and AVGSC) and the independent variables (GRAD, SELECT, BACC, and AACC). This method of analysis includes each of the identified variables and calculates the significance of that variable.

Hypothesis 1: Advanced Degree versus Bachelor's Degree

Hypothesis 1 proposes that CPA candidates who have earned a graduate degree will perform at a higher level than those candidates who have only completed an undergraduate degree. As predicted, the exam results were significantly higher for those candidates possessing a graduate degree. The results of our analysis show that GRAD is positively and significantly related to PASS% (Spearman's rho = 0.223, p = 0.000; Pearson's r = 0.218, p = 0.000) and AVGSC (Spearman's rho = 0.240, p = 0.000; Pearson's r = 0.213, p = 0.000). Using regression analysis to evaluate the fit of the proposed model, GRAD is determined to be significant to the model for both the PASS% (t = 9.981, p = 0.000) and AVGSC (t = 9.686, p = 0.000). Therefore, Hypothesis 1 is supported and GRAD will be included the final models.

Hypothesis 2: Degree from a more selective institution versus less selective institution.

Hypothesis 2 proposes a positive relationship between CPA candidates' performance on the CPA exam and the selectivity of the institution from which the candidate earned a degree. Selectivity was based on standardized entrance exam scores of the students admitted to that institution. As predicted, the exam results were significantly higher for those candidates possessing a degree from a more selective institution compared to those candidates who earned a degree from a less selective institution. The results of our analysis show that SELECT is positively and significantly related to PASS% (Spearman's rho = 0.501, p = 0.000; Pearson's r = 0.512, p = 0.000) and AVGSC (Spearman's rho = 0.504, p = 0.000; Pearson's r = 0.525, p = 0.000). Using regression analysis to evaluate the fit of the proposed model, SELECT is determined to be significant to the model for PASS% (t = 22.201, p = 0.000) and AVGSC (t =22.890, p = 0.000). Therefore, Hypothesis 2 is supported and SELECT will be included the final models.

Hypothesis 3: Degree from an AACSB business accredited institution versus Degree from a Non-AACSB business accredited institution.

Hypothesis 3 proposes a relationship between CPA candidates' performance on the CPA exam and whether or not the business school from which the candidate earned a degree had AACSB accreditation. As predicted, the exam results were significantly higher for those candidates possessing a degree from an institution possessing AACSB business accreditation than those candidates who earned a degree from an institution without AACSB business accreditation. The results of our analysis show that BACC is positively and significantly related to PASS% (Spearman's rho = 0.287, p = 0.000; Pearson's r = 0.282, p = 0.000) and AVGSC (Spearman's rho = 0.293, p = 0.000; Pearson's r = 0.295, p = 0.000). Using regression analysis to evaluate the fit of the proposed model, BACC is determined to be significant to the model for both PASS% (t =

3.764, p = 0.000) and the AVGSC (t = 4.209, p = 0.000). Therefore, Hypothesis 3 is supported and BACC will be included in the final models.

Hypothesis 4: Degree from an AACSB accounting accredited institution versus Degree from a Non-AACSB accounting accredited institution.

Hypothesis 4 proposes a relationship between CPA candidates' performance on the CPA exam and whether or not the business school from which the candidate earned a degree had AACSB accounting accreditation. As predicted, the exam results were significantly higher for those candidates possessing a degree from an institution with AACSB accounting accreditation than those candidates who earned a degree from an institution without AACSB accounting accreditation. The results of our analysis show that AACC is positively and significantly related to PASS% (Spearman's rho = 0.265, p = 0.000; Pearson's r = 0.256, p = 0.000) and AVGSC (Spearman's rho = 0.277, p = 0.000; Pearson's r = 0.273, p = 0.000). Using regression analysis to evaluate the fit of the proposed model, AACC is determined to be significant to the model for both PASS% (t = 5.732, p = 0.000) and AVGSC (t = 6.433, p = 0.000). Therefore, Hypothesis 4 is supported and AACC will be included the final models.

Regression Analysis

Regression models are commonly used in academic research to help evaluate the value of independent variables when creating a predictive model of behavior (Boone et al, 2006; Raghunandan et al, 2003; Young, 1988). We used a linear regression model and found that each of our independent variables (GRAD, SELECT, BACC, and AACC) are significantly related to our dependent variables (PASS% and AVGSC) and therefore should be included in the final models. Because two dependent variables were examined, two separate models were established. Both of these models are presented below.

Table 4: Multiple Regression Analysis on CPA Pass Rates and Average Score
Panel A – Pass Rate as the Dependent Variable

Variable	Standard Beta	Standard Error	t-value
Constant			-7.515*
GRAD	0.229	0.007	9.891*
SELECT	0.502	0.028	22.201*
BACC	0.091	0.011	3.764*
AACC	0.132	0.007	5.732*

F = 191.389 p < 0.000 R = 0.605 R^2 = 0.367

Significance: *<0.001

Panel B – Average Score as the Dependent Variable

Variable	Standard Beta	Standard Error	t-value
Constant			52.253*
GRAD	0.221	0.212	9.686*

SELECT	0.510	0.909	22.890*
BACC	0.100	0.360	4.209*
AACC	0.147	0.210	6.433*

F = 206.585 p < 0.000 R = 0.620 R2 = 0.384

Significance: *<0.001

Panel A of Table 4 presents the relationship between the independent variables and PASS%. The model is statistically significant (F = 191.389, df = 1,327; R^2 = 0.367). This model also presented a constant of -7.515. The variable that appears to have the highest impact on the success rate of a candidate is SELECT with a standard beta of .502.

Panel B of Table 4 presents the relationship between the independent variables and AVGSC. The model is statistically significant (F = 206.585, df = 1,327; R^2 = 0.384). This model also presented a constant of 52.253. The variable that appears to have the highest impact on the success rate of a candidate is SELECT with a standard beta of .510.

Conclusions

Many factors may impact the success of CPA candidates on the Uniform CPA Examination. The purpose of this study was to determine whether or not completing a graduate degree had a positive effect on CPA exam performance. We found that both the average pass rates and average scores on the exam were significantly higher for candidates who completed a graduate degree as compared to candidates who only completed undergraduate credits. Our study also replicated the results of prior studies in that the type of accreditation of school attended and school selectivity also had an effect on exam performance.

The choice of whether to continue an educational path beyond an undergraduate degree is complex. With the significant cost of a college education, accounting students must carefully consider the differential costs and benefits of the alternatives to complete 150 hours. We, as well as colleagues at other institutions, have observed a growing number of the best and brightest accounting students deciding early in their undergraduate studies to complete 150 credits at the undergraduate level in lieu of the more undergraduate/graduate credit combination. Given successfully passing the CPA exam is often cited as a goal of the 150-hour rule, our results will help to provide additional guidance to these students as they plan their curricular paths.

While our main result is consistent with some prior studies, we extend our understanding of the relationship between graduate studies and CPA exam performance by analyzing data from the current computerized exam format. This new format not only changed the mechanics of taking the exam but it also changed how often candidates could take the exam in a given year as well as how many parts had to be taken in a single sitting. Given such structural changes, strategies to prepare for the exam have likely changed which could have impacted the relationship between education and exam performance.

Similar to earlier studies, we find that exam performance is affected by an institution's accreditation and the selectivity of their admissions process. Graduates from programs with AACSB accounting accreditation exhibit the highest performance on the exam followed by graduates from programs with AACSB business accreditation. Graduates from non-accredited institutions exhibited the weakest exam performance. In addition, graduates from more selective institutions outperform those from less selective ones. These findings should also be useful to students in their process of selecting an accounting program. While many factors, academic and non-academic alike, enter into this decision our analysis reveals that students should be partial to accredited schools with more rigorous admission standards to maximize the likelihood of success on the exam.

Early in 2016, the American Institute of Certified Public Accountants (AICPA) issued *Practice Analysis Final Report: Maintaining the Relevance of the Uniform CPA Examination* in which it announced changes to the exam that would take effect in April 2017 (AICPA 2016). These changes are intended to better reflect the responsibilities of newly licensed CPAs who are required to perform more advanced tasks and contribute to increasingly complex projects earlier in their accounting careers (AICPA 2015). Future exams are likely to be more difficult as they will place a greater emphasis on the testing of higher order cognitive skills. We would argue that with this increase in the level of difficulty, the completion of a graduate will become even more important for candidates to successfully pass the exam.

Our results should also be of interest to educators. As the competition for accounting students continues to intensify, schools will need to further differentiate the value proposition of their program from peer institutions. One of these differentiators, graduates' performance on the CPA exam, will continue to be carefully scrutinized by prospective students (and their parents) in light of the spiraling costs of higher education. While accounting faculty have limited, if any, input into the admissions process or the decision to pursue accreditation, they can more readily influence their school's program offerings. Schools without graduate programs may find themselves at a competitive disadvantage recruiting-wise, particularly in light of upcoming changes to the exam. While cost considerations often weigh heavily on the decision to implement a graduate program, failure to do so may ultimately have a negative effect on an undergraduate accounting program's ability to attract high-quality students.

The implications of our results may be limited given we examined overall performance on the CPA exam. Future studies could investigate performance on each of the four sections (Financial Accounting and Reporting, Auditing, Regulation and Business Environment and Concepts) of the exam. While we find accreditation to be significant in explaining exam performance we focused solely on AACSB accreditation. Future studies could expand the analysis by examining the impact on performance of other accrediting types such as the Accreditation Council for Collegiate Business Schools and Programs (ACBSP) and the Council for Higher Education Accreditation (CHEA). Finally, as in earlier studies we use reported scores on standardized entrance exams to measure the selectivity of our sample institutions. Recently, a growing number of graduate programs have been waiving the GMAT requirement, particularly for accomplished applicants. This may have contributed to the number of graduate schools for which an average GMAT score could not be obtained and, thus, were eliminated from consideration in our main analysis. It may also have had an impact on the average GMAT score reported for some of the schools included in

our sample. While we believe that this does not materially diminish our results, future studies might consider alternative measures for selectivity to ensure the inclusion of a broad sample of schools.

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