THE RELATIONSHIP OF CPA EXAM DELAY AFTER GRADUATION TO INSTITUTIONAL CPA EXAM PASS RATES

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ABSTRACT

This study investigates the relationship between average delay after graduation before sitting for the CPA exam, and average institutional CPA exam pass rates. Data suggest delay in taking the CPA exam has a significant negative relationship with institutional CPA exam pass rates. Graduates of universities who, on average, delay for shorter periods before sitting for the CPA exam have systematically higher average pass rates. Delay as a lone variable predicts 5.7% of total variance at 605 U.S. universities in this study. Delay in combination with other known correlates of CPA exam success (i.e. program selectivity, AACSB accreditation, 150 semester hour requirement, and school type) is also examined. Delay explains 3.6% of sample variance beyond that explained by these other variables. The negative relationship between delay and institutional CPA exam pass rates is discussed including speculation about why surprisingly large systematic differences in delay among U.S. universities exist. Implications of findings to accounting educators and to accounting graduates planning to take the CPA exam are considered.

INTRODUCTION

A number of prior studies have investigated and reported on correlates to institutional CPA exam success. Variables associated with CPA exam success include program selectivity, program accreditation status, program size, and school type (i.e. public, private not-for-profit, or private for-profit) (Brahmasrene and Whitten, 2001; Davidson, 2002; Boone Legoria, Seifert and Stammerjohan , 2006; Bergin, Morgan, and Sallee, 2011; Morgan and Ihrke, 2013; and Morgan, Bergin, and Sallee, 2013 & 2009).

This paper investigates the relationship between average delay after graduation of an institution's graduates before first sitting for the CPA exam and CPA exam pass rates of graduates of those institutions. In addition this study investigates the significance of delay in explaining differences in CPA exam pass rates after eliminating the effects of other known correlates to CPA exam success such as program selectivity, accreditation status, 150 semester hour requirement, and school type.

PREVIOUS STUDIES

Prior studies identify several factors associated with CPA exam success both within and between universities. Early studies were primarily of within-university design. For example, Reilly and Stettler (1972) reported higher CPA exam scores are positively correlated with SAT entrance scores, and also with the GPA's of students taking the exam. Completion of a coaching course (review course) was also found to predict some variance beyond that of SAT scores and college GPA, but only marginally. In similar study, Zook and Bremser (1982) reported significant correlations between higher CPA exam scores (dependent variable) and SAT entrance scores, self-reported time spent reviewing prior to sitting for the exam, and candidate participation in CPA review classes (independent variables) again at a single university. In a later study Ashbaugh and Thompson (1993) showed a significant positive between CPA exam pass rates with high school class rank, high school class size, and CPA coaching course grades.

More recent studies use between institution designs. These studies look at the differences in institutional CPA exam pass rates and their correlations to other factors that differ among these institutions. For example, Grant, Ciccotello, and Dicke (2001) reported institutions in states requiring 150 semester hours of university credit before sitting for the CPA exam had only marginally higher institutional CPA exam pass rates than those at institutions in states not having this requirement. Their findings also showed CPA review courses had a larger impact on CPA outcomes than did the extra university credits. This study also reported a positive association between Association to Advance Collegiate Schools of Business (AACSB) accreditation and CPA exam pass rates. Specifically graduates at universities having AACSB accredited business schools had on average a 7.6% higher pass rates than graduates from business schools not accredited by the AACSB.

In another study Boone, Legoria, Seifert, and Stammerjohan, (2006) also reported on the connection between AACSB business school accreditation and CPA exam success of graduates. They found, after removing the effects of differences in program selectivity, program size, faculty credentials, and faculty research productivity, only small differences remain in the average CPA exam scores of AACSB accredited and unaccredited business schools.

Morgan, Bergin, and Sallee (2012) reported alternate types of business school accreditation have markedly different relationships to average CPA exam scores of graduates.

Graduates of *Association to Advance Collegiate Schools of Business (AACSB)* accredited accounting programs had the highest overall CPA exam scores followed by graduates of *AACSB* accredited business schools. Graduates of business programs accredited by the *Accreditation Council for Business Schools and Programs (ACBSP)* and graduates from business programs accredited by *International Assembly for Collegiate Business Education (IACBE)* did not have higher average CPA exam scores than candidates from schools with no business school accreditation whatsoever. Surprisingly, *ACBSP* accreditation was found to be associated with lower CPA exam scores than those at schools without any business school accreditation whatsoever.

Another recent study showed type of college or university (public, private not-for-profit, or private commercial) is also associated with CPA exam pass rates. Morgan and Ihrke (2013) reported average CPA exam scores differ among public (state) universities, not-for-profit private universities, and private commercial universities. Average CPA exam scores of graduates from public universities and not-for-profit private universities were found to be essentially equivalent overall. However, the average CPA exam scores of graduates from private commercial universities were found, on average, to be approximately 40% lower than the other two groups.

MOTIVATION

This study considers at the institutional level whether systematic differences exist between average delay after graduation before first sitting for the CPA exam and average CPA exam pass rates of an institution's graduates. "Delay" as a potential predictor of CPA exam success not been examined in accounting literature. The question is also asked whether "delay" predicts differences in CPA exam pass rates beyond that explained by other known correlates to CPA exam success.

DATA SELECTION AND METHODS

Business schools selected in this study included all colleges and universities having specified characteristics and intersecting of two databases. The first database is U.S. Department of Education, Institute of Education Sciences-National Center for Education Statistics (IES, 2013). IES statistics include data on all institutions of higher education in the 50 United States and District of Columbia. From IES statistics, only institutions offering bachelor's degrees, having "traditional" student bodies (i.e. defined as having 75% or more of all undergraduates age 24 years or less per Department of Education statistics), admitting full-time degree seeking freshmen, and reporting ACT scores of entering freshmen each year were selected. Two- year institutions (community colleges), institutions not reporting ACT scores to the Department of Education, and non-traditional schools serving older, part-time, or degree-completion students only were excluded.

The second database whose intersection with the first resulted in the final sample analyzed was *NASBA 2013 Uniform CPA Examination, Candidate Performance*, published by the National Association of State Boards of Accountancy (NASBA, 2013). NASBA is responsible for administering the CPA exam in all 54 U.S. jurisdictions, and reports outcomes of each institution whose graduates sit for at least five sections of the CPA exam during the year. Appendix H of *NASBA 2013 Uniform CPA Examination, Candidate Performance*, (NASBA, 2013) lists all U.S. colleges and universities whose graduates as first-time candidates with a

bachelor's degree as their highest degree, completed five or more sections of the uniform CPA exam during 2013.

The intersection of the U.S. Department of Education four-year schools (with the characteristics described above) with *NASBA 2013 Uniform CPA Examination, Candidate Performance*, Appendix H schools resulted in a final sample of 605 four-year colleges and universities all of whom admit full-time degree seeking freshmen and report ACT scores of entering freshmen to the Department of Education, and all of whom had graduates completing at least five sections of the uniform CPA exam during 2013.

The dependent variable in all analyses was average institutional CPA exam pass rate as reported in *NASBA 2013 Uniform CPA Examination, Candidate Performance- Appendix H* (NASBA, 2013). How CPA exam pass rates are related to the independent variable "delay" has been the primary concern of this study. CPA exam pass rates and "delay" are first examined using one-way ANOVA. CPA exam pass rates (the dependent variable) are examined at three levels of "delay" (the independent variable), short, moderate, and long delay.

"Delay" has been operationalized for purposes of this study as the average length of time between graduation and the time an institution's graduates first sit for the CPA exam. "Delay" is measured as the difference between 23 years of age (estimated average age at graduation at the 605 traditional universities in the sample) and the age (on average) of an institution's graduates first sitting for the CPA exam per NASBA in Appendix H (NASBA, 2013).

The American Council on Education (American Council on Education, 2013) estimates the average age of U.S. undergraduates (at traditional universities) in 2013 at time of college entry is 18 years. They further estimate most graduate within 5 years. Since the sample of 605 schools in this study does not include non-traditional universities comprised of more older, nontraditional students, the estimated average age at graduation should be approximately 23 years at all of the schools in the sample. Assuming freshmen enter at approximately 18 years of age and graduate on average approximately 5 years later, then graduation (on average) at 23 would be normal (18 + 5 = 23 years at graduation).

The operationalization of "delay" as the difference between average reported age of an institution's candidates first taking the CPA exam per NASBA data (NASBA, 2013) and an estimated average age of 23 years at graduation, though not a perfect measure of "delay", is arguably a close approximation in the 605 sample schools. To the extent "delay" as operationalized in this study is in error, the true relationship between the "delay" as intended, and CPA exam scores would be obscured.

One additional comment about "delay" as operationalized: while reported analyses assume an average graduation age of 23 years, additional analyses were performed (though not reported) assuming average graduation ages from as low as age 21 years to as high as 23.5 years in increments of 0.5 years for all 605 sample schools. Results of these analyses were much the same as reported outcomes. It was noted if average age at graduation was assumed to be 24 years or more, an increasing number of the 605 sample schools had "negative" delay, an irrational result and one that suggests that the average age at graduation for sample schools was less than 24 years. Though clearly not an ideal and direct measure of "delay", the operational measure of "delay" utilized for this study is arguably a good approximation for sample schools, and was the best possible measure of "delay" from the available data.

The first formal analysis is a one-way ANOVA between CPA exam pass rates at 3 levels of "delay", low, moderate, and long delay. "Low delay" was defined as average delay after graduation before sitting for the CPA exam of 2.5 years or less. "Moderate delay" was defined

as average delay after graduation before sitting for the CPA exam of more than 2.5 years and less than or equal to 5 years. "Long delay" was defined as average delay after graduation before sitting for the CPA exam of more than 5 years.

In addition, an examination of the multivariate relationship between CPA exam pass rates simultaneously with five independent variables (including "delay") is reported. The multivariate analysis was conducted using a forward stepwise regression between CPA exam pass rates with five independent variables entered in order of significant variance explained. Independent variables in the multivariate analysis were "program selectivity", "accreditation status", "school type", "150 hour requirement", and "delay". All independent variables, excepting "delay" are known correlates to CPA exam pass rates per earlier research.

"Program selectivity" was operationalized in this study by using the average ACT scores of the 2013 entering freshmen class at each institution per U.S. Department of Education statistics (IES, 2013). More precisely "program selectivity" has been operationalized as the midpoint between reported ACT scores at the 25^{th} and 75^{th} ACT percentiles for 2013 entering freshmen class. "Program selectivity" is analyzed at five levels as follows: "highly selective programs", "selective programs", "traditional programs", "liberal programs", and "open programs". These five levels mirror those used by the ACT, itself, in characterizing selectivity of universities based on the ACT scores of entering freshmen. "Highly selective programs" are those whose midpoint freshmen ACT scores average 28 or above. "Selective programs" are those whose midpoint freshmen ACT scores average 25 to 28. "Traditional programs" are those whose midpoint average freshmen ACT scores are 22 to 25. "Liberal programs" are those whose midpoint average freshmen ACT scores are 19 to 22. Finally, "open programs" are those whose midpoint average freshmen ACT scores are lower than 19.

"Accreditation status" has been operationalized in this study at one of two levels, *AACSB accredited* business program, or not *AACSB accredited*. Accreditation status for each of the 605 sample schools was determined through reference to the current membership listing found on the AACSB website in July 2013 (AACSB, 2013).

"School type" was operationalized as one of three types: public (state) universities, private not-for-profit universities, and private commercial universities. "School type" was determined by reference to U.S. Department of Education statistics (IES, 2013).

Lastly, the "150 semester hour requirement" was operationalized as either existing in state law of the state in which the institution is located or not part of state law in the state in which the institution is located.

RESULTS

Table 1 presents the results of the ANOVA of CPA exam pass rates at three levels of "delay", "low delay", "moderate delay", and "long delay". The null hypothesis is rejected. CPA exam scores differ significantly across the three groups of "delay" ($p. < 0.05$).

Table 2 summarizes the mean CPA exam pass rates at each of the three levels of "delay". Mean CPA exam scores are highest when average delay is lowest (i.e. 57% average CPA exam pass rate when delay is less than 2.5 years), next highest when delay is moderate (i.e. 51% average CPA exam pass rate at delays between 2.5 and 5 years), and lowest when delay is longest (i.e. 45% average CPA exam pass rate when delay is more than 5 years).

Table 3 presents the results of post hoc contrasts at each of the three levels of "delay" to the other two. Each level of "delay" differs significantly from the other two ($p. < 0.5$)

Table 1		**ANOVA - CPA Exam Pass Rate by Delay**				
		S. of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups (Combined)						
Linear Term	Unweighted	13844.654	2	6922.327	23.091	.000
	Weighted	13799.004	1	13799.004	46.029	.000
	Deviation	13838.919	1	13838.919	46.163	.000
		5.735	2	5.735	.019	.019
Within Groups		180471.767	602	299.787		
Total		194316.421	604			

Table 2	**GROUP MEANS -- Average CPA Pass Rate by Delay Category**			
	N	**Mean Pass Rate**	**Std. Deviation**	**Std. Error**
Short delay (2.5 years or less)	182	56.6	16.9571	1.2569
Moderate delay (> 2.5 years to 5 years)	217	50.8	15.8858	1.0784
Long delay (> 5 years)	206	44.6	18.9887	1.3230
Total	605	50.4	17.9364	.7292

Table 3	**POST HOCS – Delay Contrasts**			
Dependent Variable Average CPA Exam Pass Rate by Institution		**Mean Difference**	**Std. Error**	**Sig.**
Short delay (2.5 years or less)	Moderate delay	5.7719*	1.7403	.003
	Long delay	11.9501*	1.7614	.000
Moderate delay (> 2.5 years to 5 years)	Short delay	-5.7719*	1.7403	.003
	Long delay	6.1782*	1.6843	.001
Long delay (> 5 years)	Short delay	-11.9501*	1.7614	.000
	Moderate delay	-6.1782*	1.6843	.001
* The mean difference is significant at the 0.05 level.				

Table 4 presents results of a simple linear regression (univariate) between CPA exam pass rates (dependent variable) with "delay" treated as a continuous variable. "Delay" predicts 5.7% of total sample variance in the sample of 605 schools. Table 5 indicates this is a statistically significant regression (p. < 0.5). Table 6 indicates the relationship between CPA exam pass rates and "delay" is inverse with a coefficient of -1.551.

Table 4	**Simple Regression CPA Pass Rate by Delay**			
	R	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
	.243[a]	.059	.057	17.4143
Predictors: (Constant), Delay (as continuous variable) (p.<.05)				

Table 5 (Simple Regression) ANOVA[a]					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	11452.109	1	11452.109	37.764	.000[b]
Residual	182864.313	603	303.258		
Total	194316.421	604			
a. Dependent Variable: Percentage passing					
b. Predictors: (Constant), Delay					

Table 6 (Simple Regression) Coefficients[a]					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	57.197	1.309		43.702	.000
DELAY	-1.551	.252	-.243	-6.145	.000
a. Dependent Variable: Percentage passing					

In a final set of analyses, the multivariate relationship between CPA exam pass rates and five independent variables together is reported. These independent variables were "program selectivity", "accreditation status", "school type", "150 hour requirement", and "delay". Independent variables were entered in a forward stepwise multivariate regression with significant variables included in the model in order of variance explained. Tables 7 – 10 show the results of these multivariate analyses.

Table 7 Stepwise Model Summary (Multiple regression)				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.327[a]	.107	.105	16.9649
2	.380[b]	.144	.141	16.6186
3	.422[c]	.179	.174	16.2957
a. Predictors: (Constant), Program selectivity				
b. Predictors: (Constant), Program selectivity, Delay				
c. Predictors: (Constant), Program selectivity, Delay, Accreditation status				

Model 3 per Table 7 (the final model) includes only three of the five independent variables. Only these three were statistically significant. Significant variables, in order of entry (variance explained) were, "program selectivity", "delay", and "accreditation status". "School type" and the "150 hour semester hour requirement" did not explain additional significant variance beyond that explained by the three included variables.

The first significant variable, "program selectivity" explained 10.5% of total sample variance as a single variable. This is followed by "delay" which explained an additional 3.6% of

sample variance beyond that of "program selectivity". This is followed by "accreditation status" which explained another 3.3%. Together the three variables explain 17.4% of sample variance.

Table 8 provides data showing statistical significance of the final multivariate model ($p < 0.05$). Table 9 shows the direction of relationship between each independent variable in the final model and CPA exam pass rates. "Program selectivity" has a positive relationship with higher CPA exam pass rates. As "program selectivity" increases" so does the average CPA exam pass rate of graduates taking the CPA exam. This finding confirms prior research. "Delay" has a negative association with CPA exam pass rates in the multivariate model as expected from its univariate relationship to CPA exam pass rates. As "delay" increases, average CPA exam pass rates decline. Lastly, AACSB "accreditation status" is positively associated with higher CPA exam pass rates. Similar to findings of earlier studies, AACSB accreditation is correlated with higher CPA exam pass rates.

Table 8 Stepwise Multiple Regression ANOVA

Models		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	20690.095	1	20690.095	71.889	.000[1]
	Residual	173259.678	602	287.807		
	Total	193949.773	603			
2	Regression	27966.968	2	13983.484	50.632	.000[2]
	Residual	165982.805	601	276.178		
	Total	193949.773	603			
3	Regression	34620.804	3	11540.268	43.458	.000[3]
	Residual	159328.969	600	265.548		
	Total	193949.773	603			

Dependent Variable: CPA Exam Pass Rate

1. Predictors: (Constant), Program selectivity
2. Predictors: (Constant), Program selectivity, Delay
3. Predictors: (Constant), Program selectivity, Delay, Accreditation status

Table 9 Stepwise Multiple Regression -- Significance of Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	26.948	2.858		9.429	.000
	Program selectivity	1.024	.121	.327	8.479	.000
2	(Constant)	34.559	3.168		10.908	.000
	Program selectivity	.930	.120	.297	7.770	.000
	Delay	-1.253	.244	-.196	-5.133	.000
3	(Constant)	26.278	3.520		7.466	.000
	Program selectivity	.808	.120	.258	6.745	.000
	Delay	-1.210	.239	-.189	-5.053	.000
	Accreditation status	6.885	1.375	.190	5.006	.000

a. Dependent Variable: Percentage passing

DISCUSSION AND IMPLICATIONS

The findings from the above analyses describe a statistically significant and inverse association between "delay" (a heretofore unexamined variable in accounting literature) and institutional-level CPA exam pass rates. "Delay" in and of itself, and also in combination with other known correlates to institutional CPA pass rates, predicts a significant variance in the CPA exam pass rates at U.S. universities. Results also confirm earlier studies concerning the positive association between program selectivity and CPA exam pass rates, and also a somewhat weaker positive association between AACSB accreditation and higher CPA exam pass rates.

One can easily imagine why there would be an inverse relationship between "delay" and CPA exam pass rates (e.g. memory fades, content on the CPA exam evolves over time, new standards evolve, work and family responsibilities increase over time reducing available time for review, etc.). Of central interest to the author however is *why* graduates of some universities systematically delay for much longer periods of time before taking the CPA exam than do graduates of other universities. Average delay before sitting for the CPA exam many large universities with hundreds of graduates sitting for the CPA exam each year is less than one year. Average delay at other similar large universities, also with hundreds of graduates sitting for the CPA exam each year, is more than six years. What explains such a wide variation in average delay across these universities?

Having taught at several large universities over my career, and having been interested in CPA exam outcomes throughout my career, I have personally observed large institutional differences in the amount of student CPA exam enculturation before graduation. The degree to which individual accounting programs develop (or fail to develop) students' understandings of the CPA exam before graduation does vary widely. Transmission of knowledge to students about the CPA exam has many aspects including in-class discussions over the four years leading up to graduation, about the importance of passing the CPA exam, publicly honoring the CPA exam success of recent alumni, encouragement to sit for the CPA exam shortly after graduation, guidance on conducting an adequate review before sitting, discussion of the merits of organized commercial CPA reviews, and general discussions about the structure of the new computerized CPA exam including tactical approaches for achieving success.

Even though accounting programs tend to have relatively similar accounting curricula, they vary markedly in the amount of information systematically conveyed to students (enculturation) concerning the CPA exam before graduation. Some accounting programs seem to consciously emphasize the CPA exam over the entire four year undergraduate period. Others barely mention it.

At one end of the spectrum students hear from multiple sources on multiple occasions that the CPA exam is an important personal benchmark. At these schools a consistent message goes out that students are expected to take and pass the CPA exam shortly after graduation. Beginning as early as the first principles of accounting course and continuing on through graduation, students are told that passing the CPA exam is necessary, should be a career goal for all, and is realistically attainable shortly after graduation after a proper review. These types of schools often offer in-house CPA exam preparation courses as electives in the final year.

At the opposite end of the spectrum are universities with little or no programmatic emphasis on informing students about the CPA exam. Graduates receive only haphazard exposure to the workings of the CPA exam prior to graduation. As a result many may have only vague ideas about when to take the CPA exam and how to approach it. They may be unaware of

the need to conduct an extensive and organized review prior to sitting for the exam, and thus are most likely to be the ones who thumb through old textbooks the weekend before sitting for the exam hoping that will be sufficient. Students from this type of institution are also the ones who too often believe a good strategy for CPA exam success is to gain several years of practical work experience before attempting to sit for the CPA exam.

In chatting with alumni and fourth-year accounting students at various universities over the years I have been amazed at how little some know about the CPA exam. Many do not even know there are four parts to the CPA exam. Some have never heard of the 150 hour requirement, and many have no idea how to actually sign up for the CPA exam after graduation. These students are likely to be the ones who wait significantly longer after graduation to sit for the CPA exam. When they do sit for the CPA exam, they are less likely to conduct an adequate review. All these factors lead to lower pass rates for these students who delay longer.

A fuller appreciation of the negative association between CPA exam pass rates and delay after graduation has implications for accounting students and also for accounting educators. Every accounting program desiring to improve its CPA exam pass rates would be well advised to inform *all* students about the strong inverse relationship between CPA exam success and delay and the likely reasons for it. The very strength of the inverse relationship suggests it has tactical importance for approaching the CPA exam as a candidate.

Accounting educators also need to think about *why* average delay in sitting for the CPA exam historically has varied so widely across universities. Further, they would be well advised to become acquainted with the average delay of their own graduates before sitting for the CPA exam and to consider whether their programs are doing all that they can to make sure their students are systematically informed about the CPA exam before graduation. If institutional differences in delay are mainly the result of differences in the amount of enculturation about the CPA exam during the university years, then accounting educators have at their disposal an achievable strategy for improving their own program's CPA exam outcomes. By intentionally implementing a system for transmitting appropriate knowledge concerning the CPA exam and when to take it to students before graduation, average delay can be reduced. CPA exam outcomes should improve. This benefits students and also benefits the accounting program's external reputation.

In conclusion, the main purpose of this study has been to determine whether a systematic relationship between delay in taking the CPA exam, and institutional CPA exam pass rates exists, and if so, to describe its nature as a separate variable and in relationship with other known correlates to CPA exam success. Results show a significant negative relationship between average "delay" before sitting for the CPA exam and average CPA exam pass rates of an institution's graduates. This negative relationship predicts differences in institutional CPA exam pass rates even after eliminating other differences such as program selectivity, program accreditation status, 150 semester hour requirement, and school type. Knowledge of the relationship between delay and CPA exam pass rates has important implications for accounting students and accounting educators alike.

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