



The State Bar of California

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DATE: February 1, 2019

TO: Members, Committee of Bar Examiners

FROM: Amy C. Nuñez, Director, Admissions

SUBJECT: Law School Performance Study Report

EXECUTIVE SUMMARY

In 2017, the Chief Justice directed the California State Bar to examine the decline in bar passage rates and the State Bar embarked on multiple bar exam studies. The studies included the *Recent Performance Changes on the California Bar Examination* which used admissions data to evaluate the historical pattern of the California Bar Exam (CBX) pass rate and changes in applicant characteristics. The study relied on data from the 2008, 2012 and 2016 administrations of the exam, and observed the following changes over this nine year period:

- The number of test takers declined by 6% including an 11% decline in the number of July test takers and a 4% increase in February examinees.
- The distribution of examinees shifted, with traditionally higher performing groups making up proportionately less of the total test takers over time.
- For the July exams, overall average Total Scale Scores (TSS) and bar passage rates dropped between 2008 and 2016: The average TSS declined 66 points (1481 to 1415) and the percentage passing was lower in 2016 than in 2008. Less pronounced decreases also occurred in the February exams over that time period.

The findings suggested other intervening variables that may be impacting applicant Bar Exam performance. As a result, the State Bar decided to embark on the study which merges bar exam performance data with individual information on student credentials.

In December, 2018 the study that merged student credentials with bar performance data to identify factors that potentially contribute to the decline in bar pass rates was released. The report, *Performance Changes on the California Bar Examination: Part 2*, used detailed student information provided by eleven American Bar Association Accredited law schools. Specifically, data on over 7,000 students who took the Bar Exam in July 2013, 2016, and 2017 were

analyzed. Between 2013 and 2016, the pass rate on the exam fell from 56 percent to 43 percent. In 2017, the pass rate rebounded slightly, to 50 percent; it declined again in July 2018 to 40.7 percent. The study found the following:

- Changes over time in the characteristics of exam takers accounted for only some of the decline in Bar Exam performance during the study period, approximately between 20 and 50 percent of the decline in Bar Exam performance during the study period, depending on the performance metric chosen and year compared
- The two student characteristics that most strongly predicted performance on the California Bar Exam were a student's GPA in the final year of law school and a student's LSAT scores
- Changes over time in entering credentials (undergraduate GPA and LSAT) and law school credentials (final law school cumulative GPA) contributed roughly equally to that portion of the decline in Bar Exam performance attributable to changes in student characteristics during the study period
- The proportion of test takers who were ethnic minorities or female grew slightly over the study period, but the study found no correlation between these demographic characteristics and pass/fail outcomes, among students with similar abilities
- Ultimately, the study was unable to account for a substantial amount of the decline in pass rates, concluding that other unexamined factors have contributed to the decade-long decrease in Bar Exam performance.

RECOMMENDATION

If the Committee agrees, the following motion is suggested:

Move that the Performance Changes on the California Bar Examination Part 2 be received and filed.

ATTACHMENT LIST

- A.** Law School Performance Study Report



2018

Performance Changes on the California Bar Examination: Part 2

New Insights from a Collaborative Study with California Law Schools

Entering law school credentials, law school experiences and grade point averages of 7,563 students from eleven California ABA approved law schools were linked to their results on the 2013, 2016 and 2017 bar examinations to determine their interrelationships and potential impact on the continuing decrease in examination scores and passage rates

Roger Bolus, Ph.D.
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12/20/18



EXECUTIVE REPORT¹

SUMMARY

Passage rates on the California Bar Exam (CBX) have declined steadily over the past decade. A 2017 study (Bolos, 2017) found that between 2008 and 2016, the percentage passing the exam declined from 62% to 44% - a drop of 18 percentage points. The reasons for the decline have been subject to extensive debate. Some stakeholders have attributed the decline to changes in the examination itself, others have argued that changes in the qualifications and credentials of bar examinees may have contributed. Still others have suggested that additional factors explaining this decrease in pass rates may include changes in law school curriculums, or shifts in undergraduate educational practices or technology.

The current study was designed to examine some of these hypotheses, including those associated with changes in law school attendee credentials. Though the study does provide some data on whether course choices (e.g., bar courses vs. skills courses and externships) affects pass rates, a primary purpose was to test the widely shared hypotheses that the quality of students, as measured by LSAT scores, undergraduate GPAs, and performance while in law school has changed over the years and that this change has accounted for much of the decline in performance on the CBX.

Thus, the three key questions this study addresses are:

- (1) To what extent can performance on the CBX be explained by various student credential measures and other measurable factors antecedent to taking the bar exam, including demographic dimensions of bar takers?
- (2) To what extent do the relationship revealed between these antecedent factors and bar exam performance in general account for the changes in bar passage during the period examined in the study?
- (3) Specifically, to what degree do students' entering credentials versus law school credentials predict ultimate bar passage, and relatedly, to what extent do these two sets of credential measures account for the changes in bar passage during the period? Addressing this question is critical for ultimately determining whether the recent declines in bar passage

¹ This Executive Report is an abbreviated synopsis of the full report and contains relevant information from the design, research questions, statistical findings and discussion sections of the report. The content is intended for a lay audience and much of the supporting detailed statistical evidence found in the body of the full report has not been included.

rates can be substantially explained by changes in these specific antecedent measures observed in the matriculated student population over the same period.

Based on the results of over 7,500 examinees sitting for the CBX in 2013, 2016 and 2017, the single best indicator for predicting success on the CBX was the final law school GPAs of candidates. This result, while important, is not surprising: students who excel on law school exams would be expected to perform well on the bar as well. Overall, the statistical models developed below which include examinees demographic characteristics, pre-admission credentials and law school performance predicts more than 54 percent of the variability in CBX Total Scale scores. By social science standards, this degree of predictive power is reasonably strong, and well in-line with findings of past efforts in this area (e.g., Kane et al. 2006).

With respect to the second question, we believe that the study documents that identifiable, systematic, and measurable changes over the study period in the antecedent demographics and credentials of examinees when taken together, do help to explain some portion, but not all, of the decline in bar scores and passage rates. Depending on the specific bar performance measure examined (i.e., passage rates vs. test scores), changes in the antecedent credentials and other characteristics account for between roughly 20 to 50 percent of the *actual decline* in bar performance during the period.

As to the third question above, it is noted already that, as far as the variability of bar performance is concerned, the final law school GPA is more predictive than entering law school credentials (LSAT and Undergraduate GPA). In assessing the differential impact of the two sets of credentials on *the changes* in bar performance during the period, however, it is clear that the final law school GPA acted as a mediating factor in moderating the impact of entering credentials. In statistically isolating the relative impact between the two sets of credential variables, the analysis did not yield unambiguous results due to their complex relationship, as well as measurement issues involving correlations between highly standardized (LSAT and bar exam scores) and non-standardized metrics (UGPA and adj. LSGPA). With that caveat in mind, the data suggests that changes in entering credentials and law school credentials both contributed about half of the overall effect noted above (i.e., 20 to 50 percent) on the decline in bar performance.

INTRODUCTION

In 2017, the California Committee of Bar Examiners and the Board of Trustees of the State Bar commissioned a set of four interrelated studies to investigate the decline in performance. Two of the reports (Buckendahl, 2017a, 2017b) focused on the content validity of the CBX and the appropriateness of the current passing standard. A third report (Bolos, 2017) used data from the State Bar of California's electronic databases to document the magnitude of the decline and the relationship of readily available examinee demographic characteristics to that decline.

This report presents the outcomes of the fourth study which focused on determining if, and to what extent, the decline in bar scores and passage rates could be attributed to changes in examinee characteristics: not only previously available characteristics, but also the entering law school credentials of examinees, their law school experiences and performance. Previous research had highlighted differences in bar performance and a variety of test-taker characteristics and credentials including type of law school attended (American Bar Association (ABA) approved vs. non-approved schools), prior performance on the Law School Admissions Test (LSAT), Grade Point Average (GPA) in law school, ethnicity and others. Historically, for example, applicants with relatively low LSAT scores graduating from a non-approved institution have demonstrated lower bar passage rates than examinees with high LSAT results graduating from ABA approved schools. The questions to be considered in the present study, then, were to what extent these relationships continued to exist and whether passage rates had declined because the types of applicants sitting for the exam had changed.

The study was conducted through the collaborative efforts of the State Bar of California and a group of California law schools, each of which provided data for the project. A Study Advisory Group (SAG) made up of State Bar staff and law school deans refined the study design, assisted in recruitment of law schools, and promoted the project across the state. All 55 law schools in the state (including ABA approved, California accredited and non-accredited institutions) were invited to participate in the study. Ultimately, eleven of 21 ABA-approved California law schools volunteered to participate; no non-ABA approved schools elected to join the project. The study recruitment efforts, and the factors affecting law schools' decisions to participate in the project are detailed in the full report.

PRIMARY RESEARCH QUESTIONS

The study focused on the 7,563 bar applicants for the 2013, 2016 and 2017 July administrations of the CBX from the participating law schools. Refer to the main report for a detailed description of the data collected on the applicants.

In order to determine if, and to what extent, changes in the characteristics of CBX test takers were related to the decline in bar passage rates, two fundamental questions needed to be addressed:

- Were there statistically stable relationships between CBX examinees' performance on the bar and their antecedent characteristics, credentials and law school experiences?
- Had the characteristics, credentials and law school experiences of those sitting for the CBX changed and, if so, to what extent did these changes explain the decline in bar scores and passage rates?

The full report provides a detailed description of the statistical methods and analytical strategy used to address these research questions. The following section summarizes the key findings related to the specific research areas.

KEY FINDINGS

Changes in CBX Performance Between 2013, 2016 and 2017

By 2013, overall CBX passage rates were already in a state of steady decline, having fallen by 6 percentage points from 2008 (from 62% to 56%) when bar passage rates were at their highest. In terms of subsequent decreases from 2013 to the latter two years in our sample:

- *Bar applicants' performance on the CBX continued its downward trend between 2013 and 2016, as evidenced by a 48-point drop in Total Scale Scores and a 16-percentage point drop in CBX passing rates.*
- *The decline in performance between the 2013 and 2016 administrations was much more pronounced among first-time test-takers than for those repeating the CBX in each of these years.*
- *CBX Total Scale Scores and passing rates increased slightly in 2017 over 2016, yet were still lower than the 2013 levels by 33 points and 9 percentage points, respectively. Examinees repeating the CBX in 2017, however, actually performed slightly better than repeaters on the 2013 administration.*
- *Scores on both of the individual CBX sections (i.e., Multi-State Bar Exam [MBE] and Written) exhibited the same pattern of decline as the total scale scores, indicating that the decline in overall performance was not a function of examinees' performance on one section of the exam as opposed to the other.*

Changes in Examinee Characteristics Over Time

The characteristics and credentials of the students sitting for these administrations were grouped into four categories: (1) demographics, (2) entering law school credentials, (3) law school “experiences,” and (4) law school performance. Data related to these characteristics were evaluated with an eye toward determining whether there were meaningful shifts in the population of examinees over time. Key findings included the following:

- *Statistically significant shifts² occurred in the demographic characteristics of test-takers from the 2013 to 2017 administrations: The average age of examinees rose slightly from 28.9 to 29.3 years; the proportion of female test-takers rose 6 percentage points; and the proportion of minority test-takers increased 6 percentage points.*
- *Statistically significant shifts also occurred in examinees' entering law school credentials across the same period. The mean Undergraduate Grade Point Averages [UGPAs] decreased steadily from the 2013 to 2017 administrations, while the proportion of students coming from the social sciences increased by 5 percentage points. A more pronounced shift was observed in the Law School Admission Test [LSAT] where mean scores decreased during the study period. The largest decrease in LSAT scores was observed among bar applicants with LSAT scores falling into the bottom quarter of scores for the study sample.*
- *We found no statistically significant temporal changes in the study measures relating to examinees' "law school experiences" including the percentages of part-time students, transfer students, attendance in the regular day program or students graduating within three years of matriculation/transfer into law school.*
- *The study analysis revealed no statistically significant differences in either the average First Year Grade Point Average [FYGPA] or Final Law School Grade Point Average [LSGPA] of examinees over the study period. Additional analysis revealed that for each of the CBX administrations, the statistical distributions for the first year and final GPAs for examinees were nearly identical, sharing common medians, means, quartile points, and score spreads. Separate analyses within each school yielded similar results. These findings were not surprising given the common practice in legal education of "grading on the curve."*

In summary, the data analyses revealed significant differences in the demographic characteristics of examinees over the three-year period, as well as statistically significant declines in their pre-law school GPAs and LSAT scores. The next step in the study was to determine if these changes in examinee characteristics could be statistically related to changes in performance on the CBX.

Law Schools' Bar-Related Curricular Changes.

In addition to individual student characteristics, selected institutional characteristics were also evaluated.

² A cautionary note is merited here. Many of the statistics presented in the report were subjected to significance testing as a means of differentiating statistically meaningful findings from simply random results. Given the study's sample size, many of the results readily reached statistical significance. It must be emphasized that statistical significance does not imply practical significance. The value of the findings in making policy decisions must be considered separately.

- *Based on the institutional level data also provided by the participating law schools, we found that a given school's curricular practices relating to the bar examination did not vary over the time period covering the three CBX administrations; however, there were sufficient differences between the schools warranting consideration in the subsequent analyses and model development.*

The Relationship of the Examinees' Characteristics and Credentials to CBX Performance

As an intermediate step in determining whether examinees' attributes could help explain the drop in CBX performance, analyses were conducted to assess the magnitude and stability of the relationships between examinees' characteristics and their CBX scores and bar passage rates. Key findings included:

- *Analysis revealed that all but three of the measures of examinee characteristics had a statistically significant relationship with examinees' MBE, Written and Total Scale Scores, and eventual Pass/Fail status. Examinees' age, ethnicity, undergraduate GPA, LSAT score, first year law school GPA, final law school GPA, part-time versus full-time status and regular day versus night time attendance were all statistically related to CBX performance.*
- *Consistent with previous research, we found that among all variables, an examinee's final law school GPA demonstrated the strongest positive relationship with their CBX Scale Scores), followed by their first-year law school GPA, LSAT, and undergraduate GPA. Thus, while all credentials were found to be related to CBX performance, the more proximate the measure was to sitting for the CBX, the stronger the relationship*
- *Smaller, yet still statistically significant relationships were observed between each of the demographic characteristics (i.e., age, gender, and ethnicity) and CBX outcomes for each administration.*
- *For the most part, the pattern of relationships between examinees' characteristics was consistent for both MBE and Written Scale Scores, though the size of the relationships was generally lower than with Total Scale Scores. A notable exception was the difference in the direction of the relationship between gender and the component scores described above; i.e., being female was associated with higher Written scores, while being male was associated with higher MBE scores.*
- *Further analysis revealed that with a few minor exceptions, the relationships between all test-takers characteristics and their CBX outcomes remained stable across the three administrations.*

The Combined Impact of Characteristics of Examinees on CBX Performance

Evaluation of the simultaneous impact of the various student characteristics on CBX performance was conducted via multi variable modeling. The modeling was designed to first determine the statistically significant set of student characteristics associated with each CBX outcome, considering their interrelationship.

Specific results from the modeling revealed:

- *Measures from all categories of examinee characteristics, except the “Law School Experience” category, statistically contributed to the combined relationship with one or more CBX metrics. Overall, the statistical models predicted more than 54 percent of the variability in CBX Total Scale scores, 50 percent and 44 percent of the variability in the MBE and Written Scores, respectively, and 33 percent in CBX passage rates. By social science standards, this degree of predictive power is reasonably strong, and well in-line with findings of past efforts in this area (e.g., Kane et al. 2006).*
- *Of the various pre-CBX performance measures, final law school GPA was the single most important predictor of CBX performance followed by LSAT. Due to its exceedingly high correlation with final law school GPA, students’ first year law school GPA added no statistically significant value and was excluded in the final models. Undergraduate GPA had a small, but statistically significant effect on Total Scale Scores only.*
- *When the pre-CBX credential measures were factored in, examinee age, gender and minority status had a much smaller, yet still statistically significant impact that varied by CBX test section. For example, being a minority had a very slight negative effect on MBE Scale Scores, but not on Written Scale Scores, resulting in an even smaller net impact (only about 8 points on the 2000- point scale) on Total Scale Scores and no subsequent impact on final Pass / Fail [P/F] status.*
- *The findings were highly consistent with previous studies in other states that examined the relationships between student credentials/law school performance and eventual performance on the bar examination.*

The Net Effect of Changes in Examinee Characteristics on *Changes* in Their CBX Performance

The preceding analyses indicated that the examinees taking the CBX during each of the three administrations differed on many characteristics found to be related to CBX performance. Therefore, the models could be validly applied as a mechanism to statistically adjust or “predict” CBX scores on the respective administrations, and subsequently quantify how much of the change in those scores could be attributed to changes in the antecedent characteristics.

- *Depending on the specific bar performance measure examined (i.e., test scores vs passage rates), changes in the antecedent credentials and other characteristics account for approximately 20 to 50 percent of the actual decline in bar performance during the period.*
- *A larger portion of the decline between 2013 and 2017 vs. 2013 and 2016 was explainable by the models, due in large part to the smaller declines observed in 2017 performance*
- *In assessing the differential impact of the pre-admission credentials vs law school performance on the changes in bar performance during the period, final law school GPA served as a mediating factor in moderating the impact of entering credentials. In statistically isolating the relative impact between the two sets of credential variables, the analysis did not yield unambiguous results due to their complex relationship, as well as measurement issues involving correlations between highly standardized (LSAT and bar exam scores) and non-standardized metrics (UGPA and adj. LSGPA). With that caveat in mind, the data suggests that changes in entering credentials and law school credentials both contributed about half of the overall effect noted above (i.e., 20 to 50 percent) on the decline in bar performance.*
- *Despite the strength of the relationships found in the study, it is critical to note that a significant portion of the decline in CBX performance between 2013 and the latter two years cannot be explained by the combination of changes in student characteristics, pre-admission credentials, or performance in law school over that period. This finding suggests that other unexplained factors most likely have also contributed to the decade-long decrease in CBX performance*

The Impact of Law School Coursework on CBX Performance

A secondary question of special interest to law school deans and faculty was whether exposure to, and performance in, specific law school courses related to the legal subject areas covered on the CBX, or in specialized courses such as bar preparation, clinical courses or intern/externships, would

lead to improved performance on the CBX. Since not all eleven schools reported data for these analyses, the following findings are limited to the unique set of schools reporting in each area.

- *Correlational analysis revealed that performance (or attendance) in a given law school course covering any of the 13 bar related topics was not uniquely related to performance on a CBX question or MBE subtest covering the same content.*
- *However, overall CBX performance correlated more strongly statistically with aggregate performance in all of the bar-related courses than with aggregate performance in all non-bar-related courses, suggesting that there may be some type of cumulative effect operating.*
- *We could find no evidence that participation in any of the other specialized course areas of interest (e.g., Bar preparation courses, Externships) had any statistically significant impact on CBX performance, either before or after consideration of students' overall law school performance, or for particular subgroups of students, such as those with lower GPAs.*

DISCUSSION

That fact that bar examination scores have been in steady decline for the past decade, both nationwide and within California, is indisputable. What has been the focus of debate are the reasons for this decline. Suffice it to say, there are a multitude of complex and interrelated social, behavioral, and economic factors involved, all most likely playing some direct or indirect role.

This study has improved in several ways upon recent quantitative investigations of the causes of these decreases that have been limited to the study of aggregated law school-level information or a single antecedent variable (e.g., see Albanese, 2015, 2016 and 2018), or limited to analysis of a single law school's students or single bar examination (e.g., Austin, 2017). The current study investigated multiple bar examination outcomes of over 7,500 test-takers from eleven ABA-Approved law schools sitting for three different administrations of the California Bar Examination.

The results of this study are valuable for many reasons. First and foremost, they helped to establish a clear and consistent link between several antecedent (i.e., pre-CBX) attributes of test-takers and their performance on the CBX, and disentangled the relative strength of those relationships. Through correlational methods, we were able to quantify the size and direction of relationships between multiple examinee characteristics, and to show that even during this period of change and decline in CBX performance, most of the relationships remained stable. The analyses also demonstrated that overall law school performance is the single measure most predictive of CBX performance; stronger than pre-law school admission credentials. In this sense, albeit indirectly, the bar exam and the ABA law schools could be thus be seen as validating each other – that is to say, that the measurement metrics valued by law schools correspond to those valued on the CBX and vice versa.

Through the statistical modeling, we were also able to look past simple one-to-one relationships and evaluate the impact of multiple examinee characteristics simultaneously. The outcome of our analysis helped to clarify the net impact of LSAT. We demonstrated that while LSAT is indeed a predictor of CBX performance, its effect is greatly attenuated when considered in conjunction with an examinee's performance in law school. These findings also serve as a reminder of the dangers of simple interpretations of the impact of racial/ethnic status on CBX performance. Consistent with the 1997 findings of Klein and Bolus, this study reconfirmed that racial/ethnic minorities with equivalent credentials to whites will tend to earn the same scores on the CBX and have the same probability of passing. Finally, the modeling helped to establish that only a portion of the recent changes in CBX performance were related to shifts in the incoming attributes of students over the past decade, and that their effects were further mediated by students' efforts while in law school. It is clear that the set of measures used in this study could not fully account for the recent decline in bar examination performance.

As mentioned above, there were several categories of variables, not available for this study *may* also have impacted on changes in CBX outcomes. For example, there are some in the legal community who have argued that recently matriculated students are coming into law school with different learning skills which are not directly measurable by an LSAT score. Once in law school, others believe that students learning styles have changed, as has the amount of time spent on coursework outside of class. Still others have argued that because of these and other issues, students' level of engagement in the overall law school experience may have been altered over time. And, once they are ready to sit for the bar examination, their methods of preparation have changed.

Many of these factors are simply working hypotheses, while some are backed by past research. They may be considered as fruitful new avenues for further investigation. Given the collaborations between the State Bar and the California law schools formed through this study, however, the opportunity now exists to systematically capture new data on the additional metrics through an ongoing survey program of stakeholders. Using self-report information from law school students, law school faculty and deans, and possibly practicing lawyers, the models developed in this study could potentially be enhanced. Data from these sources could subsequently be applied to quantify the impact of many of these hypothesized factors, and be used on an ongoing basis to determine their role in the shifting performance on the CBX.

ACKNOWLEDGMENTS

We would like to acknowledge several individuals who made this report possible. First, we would like to thank the past and current Director of Admissions of the State Bar of California for having the foresight to undertake this investigation and insure its funding. We would also like to recognize the California Committee of Bar Examiners and the Board of Trustees for approving the study as part of its ongoing research program to maintain the integrity of the California Bar Examination. Thanks also go to the Study Advisory Group for its assistance in helping to shape the study and its efforts to help promote California law school participation.

The staff of the California Bar also played pivotal roles. The legal staff was instrumental in dealing with the complex issues of data confidentiality. Special thanks go out to Ron Pi of the California Bar for his perseverance and amazing attention to detail in working with the participating law schools to collect and manage the data which was the lifeblood of the study. Ron also served as a sounding board during all phases of the study and assisted in some of the multivariate modeling work. We also appreciate the contributions made by Ms. Sally Menninger Bolus of Research Solutions Group, who served as an exacting editor on early drafts of the report.

Our final thanks go to the deans of the participating California law schools who initially saw the wisdom in using empirical data to address issues relating to decreasing bar examination scores and to their staff for their time and conscientiousness in gathering data on their students.

TABLE OF CONTENTS

TABLE OF CONTENTS	xii
TABLES & FIGURES	xiii
APPENDICES	xiv
 I. INTRODUCTION.....	1
Background	1
Evolution of the Design.....	2
II. METHODS & PROCEDURES	6
Research Questions.....	6
Recruitment of Law Schools	7
Data Sources and Study Variables	8
Creation of the Study Database	9
Representativeness of the Sample	10
The Participating Law Schools.....	15
III. RESULTS	17
Research Questions	
1. Examinee performance on the CBX and changes over administrations	18
2. Examinee characteristics/credentials and changes over administrations	23
3. Relationship between examinee characteristics/credentials and CBX performance ..	29
4. Impact of examinee characteristics/credentials on changes in CBX performance	38
5. Impact of CBX-Related Law School Coursework on CBX performance	48
IV. SUMMARY & DISCUSSION.....	55
REFERENCES	65
APPENDICES	67

TABLES & FIGURES

<u>Table No.</u>	<u>Title</u>	<u>Page No.</u>
II.1	CBX Examinees by Study Participation Status and School Type.....	10
II.2	Representation of Special Subgroups in Study Sample and Among Other CBX Examinees.....	11
II.3	CBX Performance of Study Sample and Other Examinees by School Type...	13
II.4	Matriculation, non-completion and graduation counts and percentages for participating law schools.....	15
III.1	Examinee Performance on the CBX Over the Three-Year Study Period by Repeater Status and Overall.....	19
III.2	Standardized Difference in Examinee CBX Performance for 2013 vs. 2016 and 2013 vs. 2017 By Repeater Status and Overall.....	21
III.3	Demographic Characteristics of Examinees from Participating Schools by the Year They Sat for the CBX.....	24
III.4	Entering Law School Credentials of Students from Participating Schools by the Year They Sat for the CBX.....	25
III.5	Characteristics of Students Relating to Their Experience While in Law School by the Year They Sat for the CBX.....	26
III.6	First Year and Final GPA Distributional Statistics for Students from Participating Schools by the Year They Sat for the CBX.....	27
III.7	Results of GLM Tests Evaluating Relationships of Student Characteristics to CBX Performance.....	31
III.8	Average and Standard Deviation of CBX Total Scale Scores by Racial/Ethnic Status and Examination Year.....	32
III.9	CBX Performance Statistics on the 2013, 2016, and 2017 Administrations for Examinees Scoring within LSAT Score Ranges.....	33
III.10	Correlations Between Entering Law School Credentials, Law School Grades, and CBX Outcomes from the 2013, 2016, and 2017 Administrations.....	34

<u>Table No.</u>	<u>Title</u>	<u>Page No.</u>
III.11	Summary of R ² Values for Regression Models Testing the Cumulative Impact of Potential Predictors of CBX Performance.....	39
III.12	Summary of Effect Sizes of the Explanatory Measures Appearing in the Final Models Predicting CBX Performance.....	41
III.13	Raw Regression Coefficients for Predictor Variables of CBX Outcomes.....	44
III.14	Unadjusted vs. Adjusted Scale Score Differences in CBX Performance on the 2013, 2016, and 2017 Administrations.....	45
III.15	Correlations of Adjusted Law School Course-Specific Grades with CBX Written Essay/Performance Task and MBE Subtest Scores.....	50
III.16	Correlations of CBX Scale Scores with Student Actual GPA in CBX-Related Courses and Estimated GPA in Non-CBX-Related Courses.....	51
III.17	CBX Passage Rates Based on Law School Performance in CBX-Related Courses vs. Non-CBX-Related Courses	52

<u>Figure No.</u>	<u>Title</u>	<u>Page No.</u>
2.1	Mean CBX MBE, Written Scale and Total Scale Scores by Administration Year.....	22
2.2	Correlations of CBX Outcomes with Students' Entering Law School Credentials and Grade Point Averages by Administration Year.....	36
2.3	Scatterplots Showing the Relationships of CBX Total Scale Score with Entering Law School Credentials, FYGPA, and LSGPA.....	37

APPENDICES

<u>No.</u>	<u>Title</u>
1	List of Study Advisory Group Members
2	List of Study Data Elements by Data Source
3	Data Confidentiality, SB690 and FERPA
4	Timeline of Study Activities and Relevant Events
5	List of Law Schools Participating in the Study
6	Data Sharing and Confidentiality Agreement with Participating Law Schools
7	Derived Variables and Adjusted Grade Point Averages
8	Procedures for Compilation and Preparation of Study Database
9	CBX Outcomes Descriptive Statistics by Student Characteristics
10	CBX Descriptive Statistics by Undergraduate, Adjusted First Year and Final Law School Grade Point Ranges
11	Methodology for Evaluating Bivariate Statistical Relationships
12	Methodology for Multivariate Modeling

I. INTRODUCTION

Background

Passage rates on the California Bar Exam (CBX) have steadily declined over the past ten years. While some stakeholders have attributed the decline to increases in the difficulty of the exam, others have argued that declines in the qualifications and credentials of bar examinees are the primary causes of the differences.

In late 2016, a series of study proposals were presented to the State Bar of California and to the Committee of Bar Examiners (the Committee) to systematically investigate the downward trend in performance on the CBX. Two of the studies were to focus on issues related to the validity of the examination, including its content and the appropriateness of the existing standards for passing. A third study would utilize data readily available in the California Bar's examination database to quantify the decreases in scores and to explore correlates and potential causal factors of the decrease in performance. With the approval of the Committee and the Board of Trustees, the two validity studies (Buckendahl, 2017a, 2017b) and the analysis of the California Bar's examination database (Bolos, 2017) were approved and completed in 2017.

The Bolus study focused on three years of test administration and employed data from six test cycles (February 2008, July 2008, February 2012, July 2012, February 2016, and July 2016). During this period, the overall average Total Scale Scores on the July administrations dropped by more than 66 points (almost a half Standard Deviation), resulting in a decrease in overall bar passage rates from 62% in July 2008 to 44% in July 2016. Analyses of the data available³ for those sitting for the examination during this period also revealed:

- Overall, the number of test-takers⁴ decreased by 6% across the eight-year period between 2008 and 2016. The number of July examinees declined by 11%, offset by a 5% increase in the number of February test-takers. February examinations have historically had a higher proportion of applicants repeating the CBX because of a previous failed attempt. Together these findings indicated that not only were fewer applicants sitting for the bar, but greater proportions were repeating it.
- The demographic composition of the applicant pool also shifted over the period examined. Traditionally higher performing demographic groups made up increasingly smaller proportions of test-takers over the three years.
- The magnitude of the decrease in scores and passage rates was not equal for test-takers from different categories of law schools. The passing rate for test-takers from California ABA schools with higher median LSAT scores dropped 11% between July 2008 and July 2016 as

³ In addition to examination scores and passing status, the CBX database includes information on applicants' gender, ethnicity/race, name of the last law school attended, the and number of prior attempts to pass the bar, if any.

⁴ The terms, "test-takers," "examinees," "applicants," and "students" are used interchangeably throughout the report.

compared to an almost 30% decrease for test-takers from California ABA schools with lower median LSAT scores.

- A disproportionate number of test-takers fell within the very lowest levels of the score distribution in July 2016 relative to July 2008 (21% versus 10%).

However, the scope of the Bolus study was restricted by the limited amount of data available on individual test-takers that could be included in the analyses. For example, information on examinees' LSAT scores was unavailable in the California Bar's examination database. Previous studies had shown these scores to be highly correlated with bar performance. The Bolus study applied the average LSAT score at the law school which test-takers attended as a proxy measure in the analyses with some explanatory success. In the end, however, the study models could only account for approximately 20% of the change in July CBX scores and 17% of the change in bar passage rates.

Based upon the results of that study, a fourth proposal to the California Bar to conduct a broader examination of the decline in performance on the CBX, taking into consideration additional individual level data on test-takers, was revisited. The proposal was approved in March 2017 by the Committee of Bar Examiners and the Board of Trustees, subsequently sanctioned by the California State Supreme Court and work on the study began in April.

This report details the evolution, research methodology, results, and conclusions of this expanded study.

Evolution of the Study Design

As originally proposed, the two major goals of this study were to determine:

- 1) Which, if any examinee characteristics or credentials were related to their performance on the CBX; and
- 2) If there were any changes over time in examinee characteristics or credentials (either pre-admission or while in law school), could they be used to help explain the decline in bar passage rates.

To answer these questions, the study design called for the California Bar to randomly select and recruit five to eight schools within each of the three major groupings of law schools in the state, including ABA Approved, California Accredited, and Unaccredited institutions. Each of the participating schools would be asked to provide individual level information on one to two hundred randomly selected first-time test-takers who took the July 2008 CBX and another one hundred randomly selected first-time test-takers who sat for the July 2016 examination. California Bar staff would then integrate the student level data provided by the schools with the bar exam results contained in the California Bar's examination database to form a single database with detailed academic and bar exam outcomes for random samples of bar applicants from 2008 and 2016. The study consultant would then conduct comparative statistical analyses of the data.

The random selection of institutions and students for the study from all three categories of schools represented in the state was central to generalizing study findings to the whole population of California bar applicants. The cooperation of the law schools would also be essential to the success of the study. As such, the original study proposal recommended the formation of a Study Advisory Group (SAG) comprised of deans from at least one law school from each of the three groups of law schools in California, a representative from the California Bar, and the project consultant. The functions of the SAG would be to provide input on the goals and design of the study, to assist in the development of the inventory of data elements that would be requested from the schools, to promote the study within California, and to assist in the review and interpretation of study findings.

The California Bar recruited SAG members in the Spring of 2017, and an initial meeting of the SAG took place in June 2017. That meeting was attended by deans from five schools (See Appendix 1), including three deans representing the 21 California ABA schools, one dean representing the 17 California Accredited institutions, and one dean representing the 17 Unaccredited Schools.

In response to concerns raised by the SAG during that meeting and later by the law schools approached to participate in the study, this original study design was revised in several ways over the course of 2017. The SAG's issues and recommendations related to the study fell into three major areas:

Research Questions. The SAG agreed that the primary focus of the study should remain on the two objectives specified above, but it also recommended that additional research questions be addressed. Assessments of the impact of several additional individual and institutional-level variables on bar performance were proposed, including examinees' performance in specific bar-related courses, opportunities for, and participation and performance in clinical experiences, the number of non-bar related courses offered at the school, curricular changes, and others. Given the limitations of the study time line and budget, it was agreed that the study consultant would conduct preliminary analyses to address some of these questions. California Bar staff, however, made a commitment to conduct further analyses of the study data collected once the current study was completed.

Data Elements. The SAG reviewed the initial proposed set of data elements that would be reported by the law schools participating in the study. The group concurred that most of the data could be obtained from the schools, although it indicated that the task would be easier for those institutions with more advanced computer systems and that unaccredited and some California accredited schools would not necessarily be able to provide LSAT scores as these were not a pre-requisite for admission. To address the additional research questions that had been proposed, the SAG also identified additional data elements that would need to be collected. These included both detailed student course-level (e.g., Credits and GPA in Constitutional Law) and institution-level (e.g., number of advanced courses offered) variables. An expanded list of the data elements was drawn up during the meeting and was refined over the following weeks by the coordinator and the study consultant. The final list

was shared with the SAG members and approved for distribution in July 2017. Appendix 2 includes the final set of examinee and institutional data that was requested, with the originally proposed elements identified as the primary data set, and the additional recommended variables identified as secondary or optional data elements.

Sample Selection. In regards to the study design, perhaps the most consequential change proposed by the SAG related to the participation of law schools and the selection of the sample of test-takers to be included in the study. As opposed to a stratified sample of 15 to 24 schools selected to represent the alternative types of national and state accreditation, the SAG members maintained that the study should be open on a voluntary basis to all 55 law schools in the state and additionally, that schools be allowed to provide data on all their bar applicants rather than a randomly selected sample of one hundred per school. The SAG recommended that the State Bar solicit interest in the study from the law school community, and SAG members agreed to promote participation by their colleagues.

In addition to the input of the SAG, concerns raised by law schools as they were approached to participate in the project also impacted the study design. Some schools raised concerns about the accessibility of data for students who had taken the exam ten years prior and the effort to do so. Other schools openly stated that they saw no benefit in participating, expressing concerns that the California Bar was no longer providing them with the data on bar exam results for their graduates which the schools were still required to report to the American Bar Association for purposes of accreditation. Public institutions also voiced concerns that the Federal Education Rights and Privacy Act (FERPA) might not protect the release of students' information to the Bar.

In response to concerns regarding the burden of data collection, instead of the originally proposed study cohorts from the July 2008 and July 2016 bar administrations, it was recommended that cohorts of bar examinees from July 2013, July 2016, and July 2017 be used. This alternative proposal assumed was that it would be easier for schools to compile and report data on bar examinees from more recent graduating classes. Additionally, examination of these three years could potentially provide insights into the impact of the new two-day examination first used in July 2017.

This proposed change had potential implications for the study analyses. By 2013, bar scores and passage rates had been on a steady decline from their highs in 2008, as had the numbers of people sitting for the bar. Additionally, although not known at the time, examinees' scores on the July 2017 exam began to increase slightly. The combined result was that the differences in exam scores, or variance, among the three more recent years was less than the more pronounced difference between the July 2008 and July 2016 administrations. From a statistical perspective, this reduction in variance increased the possibility of not finding statistically meaningful patterns in the data. Despite these methodological concerns, however, it was agreed by all stakeholders that the more recent years (2103, 2016 and 2017) should be used for the study to reduce the data collection burden for, and increase the likelihood of participation by law schools.

Although it did not have a direct impact on the study design itself, pending legislation regarding data confidentiality and security protections for the exchange of information between the California Bar and state law schools also proved to be relevant to the implementation of the study. State Assembly Bill 690 (SB690) was introduced in February 2017, prior to the approval of this project. Various drafts of the bill were considered as it wound its way through the legislative process, some of which included text that would have negated the possibility of conducting the study. Ultimately, the law schools agreeing to participate in the study decided that the final version of the bill signed into law in October 2017 provided the protection necessary to provide the data required. (See Appendix 3 for the relevant text from SB 690). Other schools cited continuing concerns about data confidentiality, however, and declined to participate.

Appendix 4 presents a detailed timeline of the events and discussions influencing the evolution of the study design that have been summarized here. The next section of the report presents the study research questions, methodology, and implementation.

II. METHODS

Research Questions

In the context of the debate over the causes of the decline in passage rates for the California bar exam, the purpose of this study was to address, through quantitative analyses, the following two questions:

- 1) Was there a statistical relationship between examinees' performance on the bar and their antecedent characteristics, credentials and law school experiences; and
- 2) Had the characteristics, credentials and law school experiences of those sitting for the CBX changed over time and, if so, to what extent did these changes explain the decline in bar passage rates.

To answer these larger questions, a series of even more specific questions regarding the cohorts of July 2013, July 2016 and July 2017 bar examinees graduating from the law schools' volunteering to participate in the study needed to be addressed:

Research Question 1: How did the cohorts of students from the participating law schools perform on the CBX in each of the three years included in the study? How did performance change over the three years?

Research Question 2: What were the demographic characteristics, academic credentials and law school experiences of the students taking the exam in each of the three CBX administrations? Did these characteristics, credentials and experiences differ in each of the three study years?

Research Question 3: To what degree were students' characteristics, credentials, law school experiences, and performance related to their outcomes on the CBX? Did the relationships remain consistent for each of the three years?

Research Question 4: Were there definable interrelationships among students' characteristics, credentials, law school experiences and CBX performance that could explain some portion of the decrease in scores and passage rates over time? Relatedly, were changes in pre-admission credentials play a significant role in those decreases.

In addition to these core questions, an ancillary question regarding the relationship between specific law school courses and bar performance was also posed:

Research Question 5: Was exposure to, and better performance in, selected law school courses related to improved performance on the CBX?

Recruitment of Law Schools

To answer these questions, data on bar examinees needed to be compiled from their law schools. As discussed in the Introduction, the original proposal to select a stratified sample of 15 to 18 schools was replaced with the opportunity for all 55 law schools in California to join the project on a volunteer basis. Appendix 4 includes the recruitment efforts made to solicit schools' participation in the relation to other key events in the study timeline. The primary outreach efforts to the schools included the following:

- In July 2017, Bar staff sent a correspondence to all 55 law schools in the state which explained the purpose of the study, identified the data that would be collected for the study, and requested a response to an online survey asking about the level of interest in participation. The deans from the SAG sent out a separate correspondence in support of the study. Responses were received from 35 schools (64%), of which 26 (47%) indicated a willingness to participate, six (11%) indicated maybe, and four (7%) declined.
- After SB 690 was signed into law in the fall, a second online survey was sent to confirm law schools' willingness to participate in the study. This time, only six ABA certified law schools committed to the project, and no California Accredited or Unaccredited schools agreed to participate. In declining participation, schools cited multiple concerns including the potential for public release of student data, the perceived value of the study to the law school, and the perceived burden of data collection, particularly from records as far back as 2008.
- In October 2017 the Bar reached out to law schools a final time, requesting that schools reconsider participation in view of the replacement of the originally proposed exam cohorts of July 2008 and July 2016 with those of July 2013, July 2016, and July 2017. Schools were given to the end of November 2017 to decide if they were interested in participating given the change. Five more schools agreed to participate in the project, providing the final study sample of 11 schools (20% of all the institutions in the State).

A list of the participating institutions is provided in Appendix 5. All were ABA approved schools. No California Accredited and Unaccredited agreed to join the study. All participating schools signed a data sharing agreement (see Appendix 6).

Data Sources and Study Variables

The two sources for all data analyzed for the study were the CBX database and the law schools agreeing to participate in the project. Appendix 2 includes a full listing of the data elements provided by each source for the study analyses.

For each examinee, the variables extracted from the CBX archives included the date of birth, gender, and race/ethnicity. Three scale scores were also extracted: Total, Written and MBE. In addition, raw scores on each of the individual essays, performance tests, and MBE subtests (expressed as percentiles in 2017) were also obtained, along with pass/fail status and an indicator of whether the examinee was a first-time taker or repeater. The above data were compiled for each July exam cycle in 2013, 2016 and 2017 in which a study subject sat for the bar.

The 11 schools agreeing to participate in the study were asked to provide both individual student and institutional level data. Within each of these categories, *primary* and *secondary* data elements were requested. Provision of the primary set for both examinees and the institution was required for inclusion in the study. Given that the secondary set of data elements could be difficult for schools to compile and automate, provision of the secondary level data was not a prerequisite for inclusion in the study.

Appendix 2 presents the final listing of all primary and secondary data requested from the schools. For the primary data set, schools were required to provide individual LSAT scores, undergraduate GPA, first-year law school GPA, and other academic credentials for those students who sat for the bar during the study time frame. At the institutional level, schools also were asked to supply information on the entering and graduating classes most closely aligned with the study cohorts, including the numbers of students matriculating and graduating, the number transferring in and out of the school, the number academically dismissed or failing to complete their degree, and other class level data.

The secondary data set requested from the schools included data elements thought to hold promise for gaining deeper insights into causal factors that might lead to better performance on the CBX. At the student level, these included units and grades earned in the legal subjects addressed in the bar exam (contracts, criminal procedure, etc.); units received in non-bar specialty classes such as intellectual property; units earned in clinical courses, judicial externships, and professional internships. At the institutional level, the information requested included the number of units required for graduation; number of concentration areas offered; number of faculty using open- book exams; and other variables of interest.

Derived Variables. For the purposes of analysis, a number of other study variables were created from the data elements obtained from the schools and CBX archives. An example of one such “derived” variable was “Graduated with Cohort” which was calculated by comparing the “Matriculating Year” and “Graduation Year” reported for each examinee by their law school to determine if the examinee had graduated within the typical 3-year duration of a law school program. This variable was subsequently analyzed to investigate the hypothesis put forth by a SAG member that, all things held equal, students who graduated on time and took the CBX immediately upon graduation earned higher scores and passed at a higher rate than those who did not.

Another major set of derived variables related to adjustments to the law school grade point averages. Previous research (e.g., Wightman, 1998) showed that law schools apply very different standards in their grading practices, and analyses that pool students across schools require some form of modification to “adjust” or “standardize” the grade point average to control for these differences. Several statistical techniques have been applied to adjust law school grade point averages, each with its own set of assumptions. For the study analyses, both an “Adjusted” First Year GPA and a Final GPA variable were created using the LSAT as a standardization variable⁵. The methodology used to generate these and other key variables derived for the purposes of the analyses followed the Wightman methodology and is detailed in Appendix 7. This methodology was also applied to the secondary variables related to individual course grades.

Creation of the Study Database

Analysis of the California Bar’s historical data files revealed that 7,654 bar examinees had graduated from the eleven participating law schools. There were 2,801 test-takers in July 2013, 2,413 test-takers in July 2016 and 2,440 test-takers in July 2017. The total sample included 6,143 (80.3%) first-time takers and 1,511 (19.7%) repeaters.

Appendix 8 provides a detailed discussion of the steps undertaken to collect and compile data about the sample of bar examinees included in the study database. The process began in December 2017 with the preparation of school-specific lists based on the law school of record for the 7,654 examinees. Participating schools were given until the end of March 2018 to compile the requested information and send their data files back to the California Bar. Because of delays, the submission of all school data was not completed until the end of May 2018, however.

Ultimately, data were provided for 7,563 of the examinees, or 98.8% of the original list. The remaining 91 test-takers could not be located for a variety of reasons, most frequently because the test-taker had graduated many years before the schools’ computer system began routine automated tracking.

⁵ Schools had the opportunity to provide both the highest LSAT earned by the student and the average over multiple attempts. Several schools only provided the highest LSAT. Because of the interest in using as many of the study students as possible, the highest LSAT was used in all analyses.

Representativeness of the Sample

Given that the participating schools were not randomly selected, the question of the representativeness of the study sample arose. To be more specific, the question that needed to be addressed was “were examinees in the study sample representative of the overall population of test-takers who sat for the three examinations?” The more closely and consistently the sample of examinees included in the study aligned with the overall population of test-takers, the stronger the argument that the study’s results could be generalized to all test-takers.

A series of statistical tests were conducted to compare three difference examinee groups: Examinees included in the study sample, all of whom attended ABA approved schools; examinees attending ABA schools not participating in the study; and examinees from non-ABA approved schools (California accredited and non-accredited schools.).

Overall Test-Takers. The data in Table II.1 indicates the proportions of the total test-taking population falling into three groupings of schools and examinees:

Table II.1

CBX Examinees by Study Participation Status and School Type

	<u>2013</u> (N=6,028)	<u>2016</u> (N=5,177)	<u>2017</u> (N=5,471)	<u>3-Year</u> (N=16,767)
<u>Total Takers</u>				
<i>In Study</i>	46%	46%	46%	46%
<i>Not in Study: ABA</i>	35%	33%	32%	33%
<i>Not in Study: Other</i>	19%	21%	22%	21%
<i>All CA Examinees</i>	100%	100%	100%	100%

Table II.1 shows that study participants, who all attended ABA approved schools, consistently made up almost half (46%) of all California test-takers on the CBX during each of the three July administrations under study. Students from other ABA schools comprised roughly another third of examinees (32% to 35%), and the remaining approximately one-fifth (19% to 22%) came from non-ABA approved California law schools. A chi-square analysis (χ^2 test) confirmed that the slight variations in the proportions of examinees from the different school groups across the three years were not statistically significant.

Special Subgroups. Comparisons of the representation of special subgroups in the study sample and the larger populations of test-takers in each study year were also made. Table II.2 presents a comparison of the proportion test-repeaters, minority and female examinees within the study sample with other examinees not included in the sample.

Table II.2

***Representation of Special Subgroups in Study Sample and
Among Other CBX Examinees***

	<u>% Examinees Within Group</u>			
	<u>2013</u> (N=6,028)	<u>2016</u> (N=5,177)	<u>2017</u> (N=5,471)	<u>3-Year</u> (N=16,767)
<u>Repeaters</u>				
<i>In Study</i>	14%	20%	26%	20%
<i>Not in Study: ABA</i>	15%	23%	27%	21%
<i>Not in Study: Other</i>	63%	68%	72%	68%
<i>All CA Examinees</i>	24%	31%	37%	30%
<u>Minority</u>				
<i>In Study</i>	41%	45%	47%	44%
<i>Not in Study: ABA</i>	43%	49%	49%	47%
<i>Not in Study: Other</i>	46%	49%	48%	48%
<i>All CA Examinees</i>	43%	47%	48%	46%
<u>Female</u>				
<i>In Study</i>	48%	53%	54%	51%
<i>Not in Study: ABA</i>	48%	51%	55%	51%
<i>Not in Study: Other</i>	46%	48%	46%	47%
<i>All CA Examinees</i>	48%	51%	53%	50%

Repeater Status. Repeating test-takers made up 30% of all 16,767 test-takers over the three-year period, with the proportion of repeaters increasing steadily from 2013 to 2017. The percentages of the repeating test-takers from schools participating in the study ranged from 14% to 26% over the period and paralleled the rates for other ABA-approved schools not in the study. Repeating test-takers made up significantly higher proportions (68% across the 3 years) of examinees who attended California Accredited and Unaccredited schools, however. Statistical χ^2 tests conducted for each year showed statistically significant differences in the proportions of three groups, but not between the study sample and examinees from non-participating law schools.

Minority Status. For purposes of the analysis, examinees self-identifying as Asian, Black, Hispanic or another non-Anglo race or ethnicity were categorized as a minority. As shown, nearly half (46%) of all examinees across all three years test were classified as minority. While the overall percentages increased slightly from 2013 through 2017, χ^2 tests indicated that there were no

significant differences in the proportion of minorities between the study sample and the other two groups of examinees.

Gender. Females steadily increased their representation among all bar examinees between 2013 and 2017, to the point where they represented the majority of test-takers in 2016 and 2017.

Examination of their representation among examinees from ABA approved schools versus non-ABA schools, however, indicated that the increase in the representation of female examinees was most pronounced among test-takers who attended ABA approved schools. Statistical tests (χ^2 test) conducted on each administration confirmed that the differences in proportions of females were statistically significant between the three groups, but there were no significant differences in the representation of females in the study sample and other examinees who had attended other ABA approved schools.

Performance on the CBX. Performance on the CBX was the final dimension on which the study sample was compared with the larger populations of bar examinees for each of the three cycles of administration included in the study. Table II.3 presents the average performance of test-takers within each comparison group (i.e., study sample, all of whom attended ABA approved schools; examinees attending ABA schools not participating in the study; and examinees from non-ABA approved schools) along with the spread of those scores as measured by their standard deviation (Sd). The statistics are presented separately by test section (i.e., MBE vs. Written) and overall (i.e., Total Scale Score). The passing rates for each group are also presented.

Table II.3

CBX Performance of Study Sample and Other Examinees by School Type

	<u>2013</u> (N=6,028)		<u>2016</u> (N=5,177)		<u>2017</u> (N=5,471)	
	<u>Ave.</u>	<u>Sd.</u>	<u>Ave.</u>	<u>Sd.</u>	<u>Ave.</u>	<u>Sd.</u>
<u>MBE</u>						
<i>In Study</i>	1,503	140	1,461	140	1,469	141
<i>Not in Study: ABA</i>	1,487	143	1,452	155	1,464	151
<i>Not in Study: Other</i>	1,358	148	1,333	147	1,346	148
<i>Total</i>	1,470	153	1,432	155	1,439	155
<u>Written Score</u>						
<i>In Study</i>	1,512	149	1,460	148	1,479	147
<i>Not in Study: ABA</i>	1,500	142	1,459	157	1,481	152
<i>Not in Study: Other</i>	1,346	115	1,303	109	1,340	128
<i>Total</i>	1,476	154	1,427	157	1,448	156
<u>Total Score</u>						
<i>In Study</i>	1,509	131	1,461	133	1,474	131
<i>Not in Study: ABA</i>	1,495	129	1,457	145	1,472	139
<i>Not in Study: Other</i>	1,350	110	1,343	122	1,343	122
<i>Total</i>	1,474	140	1,444	142	1,444	142
<u>Passage Rate</u>	<u>%</u>		<u>%</u>		<u>%</u>	
<i>In Study</i>	71%		55%		62%	
<i>Not in Study: ABA</i>	68%		53%		59%	
<i>Not in Study: Other</i>	19%		13%		22%	
<i>Total</i>	60%		46%		52%	

A series of two-factor (i.e., Year and Group) Analysis of Variances (ANOVAs) were conducted to evaluate the differences in performance among the three groups. Each analysis included a test of the interaction between these two factors to evaluate the consistency of any differences between the study sample and the two comparison groups (i.e., non-participating ABA examinees and non-participating, non-ABA examinees) over time.

Table II.3 reveals that, consistent with already published statistics, overall CBX scores and passage rates for all three groups dropped from 2013 to 2016, and then improved slightly in 2017. The ANOVA tests conducted on each of the CBX sections and the Total Scale Score showed that all year-over-year differences were statistically significant ($p < .001$). Additional post hoc tests indicated that the differences between the average performance of any two pairs of years (i.e., 2013 vs. 2016, 2013 vs. 2017, and 2016 vs. 2017) were also statistically significant ($p < .001$).

Statistically significant differences ($P < .001$) were found in the average performance of test-takers from each of the school groups on all metrics. No “group by year” interactions were detected, however, suggesting that the pattern of differences in the performance of the three groups remained consistent over time.

Not unexpectedly, the performance of test-takers in the non-ABA approved schools was much lower than the students from either of the other two groups. In 2017, for example, test-takers from non-ABA approved schools received an average Total Scale Score of 1,343 compared to test-takers from ABA schools (including both school participating and not participating in the study), who received an average Total Scale Score of 1,470, a difference of almost a full standard deviation.

When the performance of test-takers in the study sample was compared to the performance of test-takers from the ABA schools that were not included in the study, the differences were also found to be statistically different but only by the smallest of margins. Passage rates were consistently higher for the study sample when compared to test-takers from non-participating ABA schools (71% vs 68% in 2013, 55% vs 53% in 2016 and 62% vs. 59% in 2017). No differences were found between these two groups in performance on the Written Section of the exam, however, where the largest score spreads were observed.

The spread of scores on each of the metrics (as measured by the standard deviation [Sd.]) for the study sample was consistent year over year, but smaller than the spread in the overall population of examinees. As a score spread narrows within any sample, the group tends to become more homogeneous in terms of performance. One outcome of this effect is that relationships with other measures that may exist in the overall population become more difficult to identify in the more restricted sample.

In summary, the study sample made up a large and consistent share of the overall CBX population of test takers across the three administrations. The sample was not reflective of the total population of examinees; nor in terms of the proportions of repeaters and females that were included. When compared to only those test-takers who attended other ABA approved schools, these differences in the representation of repeaters and females were not statistically significant.

Differences in performance on the CBX emerged as the most statistically significant factor to distinguish the study sample. The largest differences in performance were observed between examinees coming from ABA approved schools (including both those participating and not participating in the project) and examinees from California accredited and non-accredited schools. Additionally, however, examinees in the study sample consistently achieved slightly higher scores on the CBX in comparison to examinees who attended non-participating ABA schools, and also passed at a slightly higher rate. *Taking all these factors into account, we concluded that findings from the study did not generalize to the entire population of CBX test-takers but were reasonably representative of the test-taker population who attended California ABA schools.*

The Participating Law Schools

To provide a general context for the analyses, Table II.4 presents a summary of the matriculation and graduation changes that took place at the participating schools during the years most closely aligned to the study period.

Table II.4

Matriculation, non-completion and graduation counts and percentages for participating law schools*

	<u>Matriculation Year</u>			<u>% Change</u>	
	<u>2010</u>	<u>2013</u>	<u>2014</u>	<u>2010-2013</u>	<u>2013-2014</u>
<u>Matriculants</u>					
<i>Total</i>	3,379	2,615	2,461	-23%	-6%
<i>Ave. per school</i>	307	238	224		
<i>Range</i>	83-453	126-388	91-375		
<u>Non-Completion</u>					
<i>% Transferring Out</i>					
<i>Ave. per school</i>	4%	6%	5%	2%	1%
<i>Range</i>	0%-12%	3%-14%	0%-13%		
<i>% Academic Dismissal</i>					
<i>Ave. per school</i>	6%	5%	5%	-1%	0%
<i>Range</i>	0%-34%	0%-19%	0%-16%		
<i>% Leaving for Other Reasons</i>					
<i>Ave. per school</i>	7%	7%	8%	0%	1%
<i>Range</i>	0%-22%	0%-15%	0%-16%		
<u>Graduates</u>	<u>Graduation Year</u>			<u>% Change</u>	
	<u>2013</u>	<u>2016</u>	<u>2017</u>	<u>2013-2016</u>	<u>2016-2017</u>
	2,786	2,193	2,066	-21%	-6%
	253	199	188		
	99-399	96-361	91-375		
<i>As % of Matriculants*</i>	82%	84%	84%		

* The graduates were not necessarily the same students as those who matriculated in the respective year

From the data in Table II.4, it can be observed that:

- The class size of the participating schools varied significantly (e.g., ranging from 83 to 453 students in 2010), and as a group, experienced a sharp drop (23%) in admissions from 2010 to 2013, with a continuing, more gradual decrease from 2013 to 2014 (6%).

- The percentage of students not graduating with their entering class also varied significantly among the 11 schools, though overall, the rates did not vary over the three entering classes.
- While the absolute number of graduates dropped significantly over the study period (21% between 2013 and 2016), the graduation rates remained fairly constant.

Based on the secondary data provided by eight of the 11 schools, it was also observed that within each of those schools, there was little variation over the study period in the grading systems that were used, graduation requirements, number of first year bar related courses, or the number upper division bar-related course units offered. As with class sizes however, there was variability between law schools on these metrics. Only one school reported using a closed-book testing policy for their students.

From the available data provided by the participating law schools, it would appear that while curricular practices related to bar examination content instruction did not tend to vary over time, there were some noticeable differences between the schools. The lack of complete data from all schools limits the use of the detailed data, but the differences that were uncovered did point to the need to account for the law school that the examinee attended in analyses of the research questions.

The following section reports on the results of the analyses addressing each of the research questions.

III. RESULTS

The study was designed to answer several questions regarding CBX performance, how it has changed in recent years, and the impact that changing examinees' characteristics may have had on CBX performance. The presentation of the results from the analyses is organized around these questions, beginning with the magnitude of the change in CBX performance between the baseline July 2013, and subsequent July 2016 and 2017 administrations.

Where applicable, we present results in both their original scales and in standardized form to aid in comparisons. Where appropriate, the results of statistical significance testing are also provided to help distinguish differences, changes, or relationships that could have occurred by chance from those that did not. To facilitate the presentation of results, detailed descriptions of more advanced statistical methods or techniques that have been used in deriving the results are presented in the appendices. Most tables dealing with CBX outcomes will include results for Written Scale Scores (WRTSCL), MBE Scale Scores (MBESCL), and Total Scale Scores (TOTSCL) and Final Status (e.g., P/F; passing rates). In the text, we will refer to the CBX performance measures by these acronyms, and refer to the students Undergraduate Grade Point Average, adjusted First Year Grade Point Average and adjusted Final Grade Point Average as UGPA, FYGPA and LSGPA, respectively.

For the sake of consistency, all the statistics presented in this section are based upon the subsamples of students for whom data was received from the law schools. As a result, values for some statistics may differ slightly from those reported in the previous section.

Research Question 1: How did examinees perform on the CBX, and to what degree did that performance change over the study period?

As a point of reference for all other analyses, Table III.1 presents distributional statistics (quartiles, means, and standard deviations) on the July CBX for 2013, 2016 and 2017. The statistics are presented for each examination section separately for first-time takers, those repeating the examination, and for all applicants from the participating law schools. To aid in interpreting the performance differences over time, statistics from Table III.1 were used to calculate separate standardized differences (“Stddif”) between 2013 versus 2016, and 2013 versus 2017.⁶ Use of Stddifs allows for a direct comparison of the size of the differences over time and over different metrics. The Stddifs are presented in Table III.2.

Total Scale Scores. Looking first at the CBX TOTSCLs for the overall population, we see 48 and 33 points decreases from 2013 to 2016 and 2017, respectively. This decrease in scores resulted in a decrease in bar passage rates from 72% in 2013 to 56% and 63% in 2016 and 2017, respectively.⁷ In terms of Stddifs, the 2013 to 2016 decrease represented more than 1/3 a Stddifs (-.37), while the 2013 to 2017 decrease represented a 1/4 Stddifs decrease. The size of the differences was much more pronounced in the applicants taking the exam for the first time versus those who were repeating. With respect to the change from 2013 to 2016, the Stddif for first-time takers was -.35 (representing an average decrease of 45 scale score points), while the Stddif for those repeating was only -.14 (an average decrease of only 18 scale score points). This difference was even more pronounced when comparing 2013 to 2017, where the Stddif for first-time takers was -.22 and a +.06 for those repeating the examination. That is to say, examinees in 2017 actually had a slightly higher mean total score than those in 2013 (1,404 versus 1,396).

An inspection of the change in the quartile points provides additional insight into sources of differences in performance over time. The Stddifs at each of the quartile points were roughly equivalent for both the 2013 to 2016 comparison and the 2013 to 2017 comparison (range of -.37 to -.41 for the former, and -.22 to -.25 for the latter). However, in both 2016 and 2017, the score decreases in the lowest 25% of first-time takers were much higher (almost 1/2 Sd in 2016 and more than 1/4 Sd in 2017) than in any of the other section of the distribution. This was not the case in the sample of students repeating the examination.

⁶ The standardized difference was calculated by subtracting the quartile and mean statistics calculated for 2013 (the baseline year) from the same statistics from the latter years and then dividing that difference by the Sd. of the 2013 scores for all test-takers. For example, the mean MBE score for first-time takers in 2013 was 1,520 and 1,479 in 2016, a drop of 41 scale points. The MBE Sd. in 2013 was 139. Thus, the standardized difference was 41/139, or .29.

⁷ The 2013 passage rate for students from the participating schools was 2% lower than in 2008 when the CBX passage rate was at its most recent peak.

Table III.1

Examinee Performance on the CBX Over the Three-Year Study Period by Repeater Status and Overall

<u>Section/ Statistic</u>	<u>Examination Year</u>								
	<u>2013</u>			<u>2016</u>			<u>2017</u>		
	<u>1st Timer</u> (N=2,372)	<u>Repeater</u> (N=375)	<u>All</u> (N=2,747)	<u>1st Timer</u> (N=1,902)	<u>Repeater</u> (N=492)	<u>All</u> (N=2,394)	<u>1st Timer</u> (N=1,842)	<u>Repeater</u> (N=580)	<u>All</u> (N=2,722)
<u>MBE</u>									
<i>1st Quartile</i>	1,432	1,324	1,415	1,393	1,323	1,372	1,397	1,335	1,382
<i>Median</i>	1,527	1,423	1,510	1,489	1,408	1,474	1,505	1,419	1,478
<i>3rd Quartile</i>	1,617	1,492	1,608	1,582	1,474	1,558	1,595	1,493	1,571
<i>Mean</i>	1,520	1,409	1,504	1,479	1,394	1,462	1,491	1,410	1,472
<i>Sd</i>	135	120	139	140	114	139	140	123	141
<u>Written</u>									
<i>1st Quartile</i>	1,428	1,312	1,410	1,377	1,290	1,360	1,409	1,317	1,387
<i>Median</i>	1,519	1,383	1,501	1,464	1,360	1,447	1,505	1,409	1,473
<i>3rd Quartile</i>	1,627	1,464	1,609	1,586	1,447	1,551	1,602	1,489	1,581
<i>Mean</i>	1,533	1,389	1,513	1,485	1,371	1,462	1,508	1,399	1,482
<i>Sd</i>	143	118	148	147	105	147	145	119	146
<u>Total</u>									
<i>1st Quartile</i>	1,448	1,328	1,416	1,384	1,320	1,368	1,413	1,345	1,386
<i>Median</i>	1,527	1,386	1,509	1,483	1,377	1,456	1,507	1,410	1,480
<i>3rd Quartile</i>	1,612	1,465	1,597	1,573	1,445	1,549	1,587	1,477	1,564
<i>Mean</i>	1,528	1,396	1,510	1,483	1,378	1,462	1,500	1,404	1,477
<i>Sd</i>	125	101	130	133	91	132	129	104	130
<u>% Passing</u>	78%	35%	72%	63%	27%	56%	70%	40%	63%

Since first-time takers make up most of the test taking population in July, we can attribute a disproportionate share of the overall drop in scores (and therefore, passing rates) over the examinations to worse than expected scores by less able first-time takers.⁸

MBE Scale Scores. The average MBESCL dropped by 42 points in 2016 compared to 2013, (Stddif of slightly less than 1/3 Sd), and 32 points from 2013 to 2017 (Stddif of about .20). Again, we see the larger decreases in scores among the first-time takers. For example, average MBESCL of first-time takers decreased by 41 points (-.29 Stddif) from 2013 to 2016 and 29 points (-.21 Stddif) between 2013 and 2017. For repeaters, those differences were quite different, the decrease was only 15 points (-.11 Stddif) between 2013 and 2016, and actually increased from 2013 to 2017 by 1 point. While slightly larger decreases over the time periods were seen in the bottom quartile of the MBE distribution, the differences were not as pronounced as in the TOTSCL distributions and occurred only for first-time takers between 2013 and 2017.

Written Scale Scores. The average WRTSCL decreased by 51 points in 2016 compared to 2013 (-.34 Stddif), which was 9 scale score points more than the drop in MBESCL. The drop was almost three times higher for first-time takers than for repeaters (-.32 Stddif vs -.12 Stddif). In 2017, performance on WRTSCL improved from 2016. Across all examinees, the average WRTSCL went from 1,462 in 2016 to 1,482 in 2017; while still a 31-point drop from 2013, it represented a 20-point improvement over 2016. On average, repeating examinees in 2017 period *improved* on average by 28-points from 2016 and actually earned a higher average score than their 2013 counterparts (1,399 vs. 1,389).

While repeaters continued to underperform relative to first time takers on all three administrations, their CBX score changes between 2013 and 2016 actually led to a 5% increase (from 35% to 40%) in their passage rate, as compared to an 8% decrease in CBX passage rates for first time takers (from 78% to 70%). It is also notable that repeating examinees made up a greater percentage of the test taking populations in 2016 and 2017 (roughly 20% each year), as compared to only 13% in 2013. These findings lend further evidence to the conclusion that the first-time examinees were the major contributors to the decrease in the overall CBX scores and bar passage rates observed between 2013 and 2017. Figure 2.1 provides a graphical illustration of the trend in scores discussed above.

In summary, we found that there were significant differences in performance on the bar examination between 2013 and the latter two years under study, with most of the differences occurring between 2013 and 2016.

⁸ In any analysis referencing differences in TOTSCL that beginning in July 2017, MBESCL and WRTSCL S were given equal weighting in calculation of the Total Scale Score. Before that point, the weighting was 35% for the MBE and 65% for the Written section. Also, in that year, the length of the Written section of the examination was reduced from six essay questions and two performance tasks to five essay questions and one performance task.

Table III.2

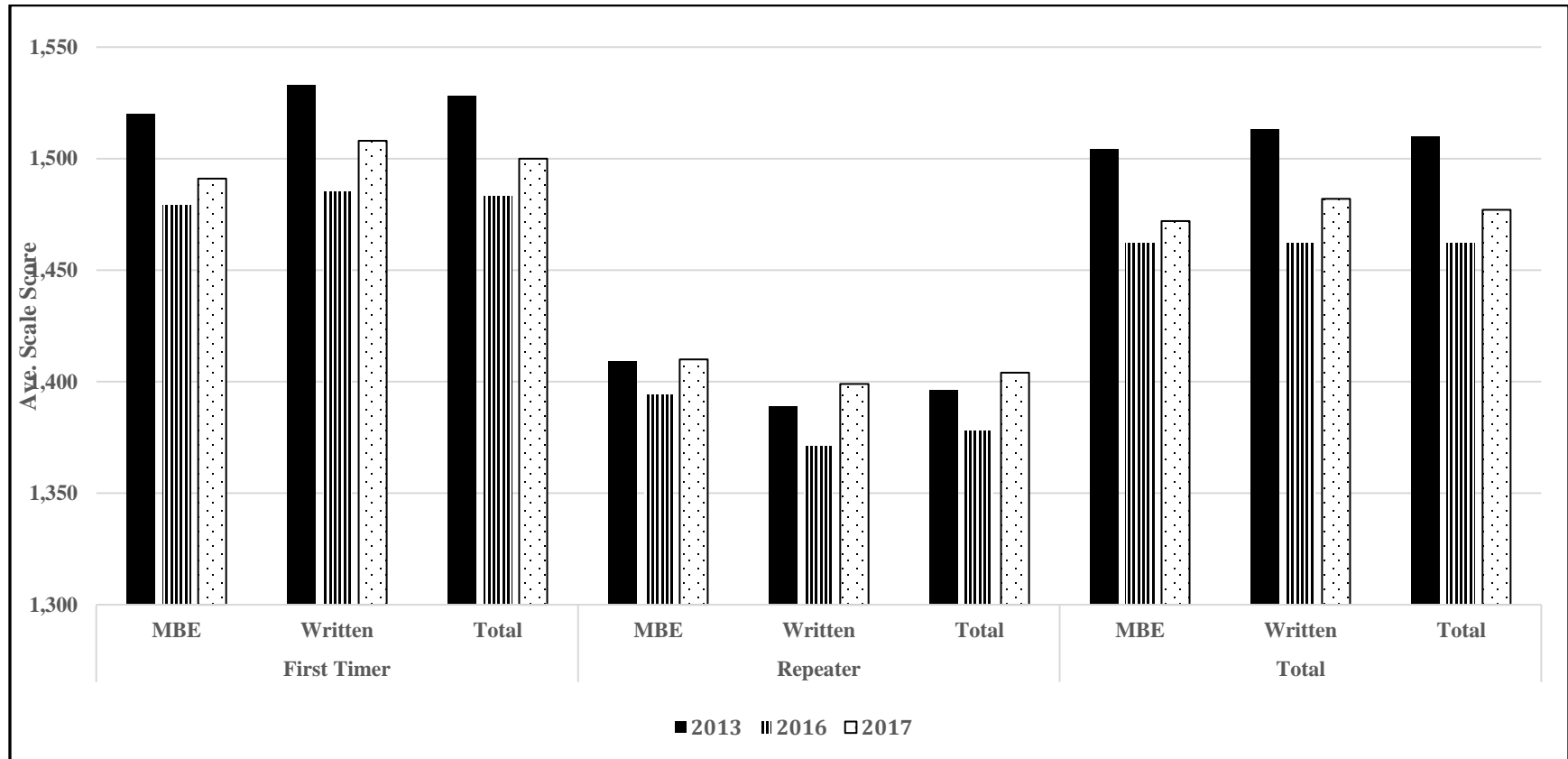
**Standardized Difference in Examinee CBX Performance for 2013 vs. 2016 and 2013 vs. 2017
By Repeater Status and Overall**

<u>Section/ Statistics</u>	<u>Standardized Difference*</u>			<u>Standardized Difference</u>		
	<u>2013 – 2016</u>			<u>2013 - 2017</u>		
	<u>1st Timer</u>	<u>Repeater</u>	<u>All</u>	<u>1st Timer</u>	<u>Repeater</u>	<u>All</u>
<i>MBE</i>						
<i>1st Quartile</i>	-0.28	-0.01	-0.31	-0.25	0.08	-0.24
<i>Median</i>	-0.27	-0.11	-0.26	-0.16	-0.03	-0.23
<i>3rd Quartile</i>	-0.25	-0.13	-0.36	-0.16	0.01	-0.27
<i>Mean</i>	-0.29	-0.11	-0.30	-0.21	0.01	-0.23
<i>Written</i>						
<i>1st Quartile</i>	-0.34	-0.15	-0.34	-0.13	0.03	-0.16
<i>Median</i>	-0.37	-0.16	-0.36	-0.09	0.18	-0.19
<i>3rd Quartile</i>	-0.28	-0.11	-0.39	-0.17	0.17	-0.19
<i>Mean</i>	-0.32	-0.12	-0.34	-0.17	0.07	-0.21
<i>Total</i>						
<i>1st Quartile</i>	-0.49	-0.06	-0.37	-0.27	0.13	-0.23
<i>Median</i>	-0.34	-0.07	-0.41	-0.15	0.18	-0.22
<i>3rd Quartile</i>	-0.30	-0.15	-0.37	-0.19	0.09	-0.25
<i>Mean</i>	-0.35	-0.14	-0.37	-0.22	0.06	-0.25

The CBX passing rates dropped by 16%, and TOTSCCL decreased by about 1/3 Stddif. In the latter administrations, the largest decreases over time were seen in the relative performance of the lower sections of the quartile distributions. *While applicants repeating the examination made up progressively larger percentages of test-takers, the largest relative decreases were seen among first-time takers.* Scores improved slightly in 2017 over 2016.

Figure 2.1

Mean CBX MBE, Written Scale and Total Scale Scores by Administration Year



Research Question 2: What were the characteristic, attributes, and credentials of examinees sitting for each of the CBX administrations, and to what degree did they change over the period of the study?

Past research on the CBX had shown that selected attributes and characteristics of examinees have helped to explain variability in score performance. In his 2017 report, Bolus demonstrated that knowledge of applicants' gender, ethnicity, previous attempts at taking the bar, and the type of law school attended contributed to an understanding of differences in score performance between the 2008 and 2016 February and July examinations. Data available in this study allowed us to extend that understanding by both supplementing the available demographic characteristics and adding entering law school credentials and performance in law school to the mix. The additional variables were selected based on previous research on bar examinations or at the recommendation of the SAG.

This section of the report provides the statistical profiles of the students from the participating schools and answers the question of whether the attributes remained stable over the study period, and if not, where they differed. The students' attributes were clustered into four categories: demographics, entering law school credentials, law school "experience," and law school performance.

Demographics. Table III.3 presents statistics on three demographic variables: age, gender, and ethnicity. Looking first at age, we see that the average examinee age increased slightly from the 2013 administration to the 2017 administration. The derived variable, categorizing age into four categories, reflected that slight shift, revealing that the proportion of applicants who were 30 years of age or older increased by more than 5%, while those 27 years of age or younger decreased by a comparable amount. We suspect that this difference reflected the higher proportion of test-takers who were repeating the CBX in 2017.

In terms of gender, the proportion of female examinees from the participating schools reflected the general population shifts of examinees as a whole. Between the 2013 baseline year of the study and 2016, males no longer represented the majority of test-takers, and by 2017 there was more than a 6% increase in the percentage of female test-takers from the baseline year.

Finally, with respect to racial/ethnic composition, we observed a steady decrease in the proportion of Anglo test-takers and a corresponding increase in minority test-takers between 2013 and 2017. While there were increases in the relative proportions of all minority groups, the largest increases were seen in the Hispanic test-takers, who comprised an additional 5.2% of test-takers relative to 2013.

Entering Law School Credentials. Participating law schools provided data on LSAT, UGPA, and the undergraduate major reported by the student at the time of admission. A summary of these statistics is presented in Table III.4.

Table III.3

***Demographic Characteristics of Examinees from Participating Schools
by the Year They Sat for the CBX***

<u>Demographic</u>	<u>Exam Year</u>		
	<u>2013</u> <u>(N=2,747)</u>	<u>2016</u> <u>(N=2,394)</u>	<u>2017</u> <u>(N=2,422)</u>
<u>Applicant Age</u>			
<u><=25</u>	15.2%	15.9%	13.8%
<u>26 - 27</u>	36.1%	33.8%	32.8%
<u>28-29</u>	22.1%	21.3%	21.6%
<u>>=30</u>	26.7%	29.0%	31.8%
<u>Avg.</u>	28.9	29.0	29.3
<u>Sd.</u>	4.9	4.7	5.0
<u>% Female</u>	47.9%	53.0%	54.1%
<u>Ethnicity*</u>			
<u>%Anglo</u>	58.9%	55.4%	53.0%
<u>%Minority</u>	38.8%	43.1%	44.9%
<u>% Asian</u>	20.5%	19.4%	19.0%
<u>% Black</u>	3.5%	4.1%	5.2%
<u>% Hispanic</u>	9.6%	14.6%	14.8%
<u>% Other</u>	5.2%	5.0%	5.9%

*Percentages may not add to 100% because of missing data

Table III.4 presents distributional data on these variables.⁹ Stddifs were calculated for both UGPA and LSAT scores using similar methods to those described in the preceding section.

With respect to UGPA, there was a minor decrease in the average UGPA from 2013 to both 2016 and 2017, represented by a Stddif of -.13. We observed a slight trend in these differences as the negative Stddifs increased for the lower quartiles. This pattern was more pronounced in LSAT scores. The average LSAT was 159.4 for students taking the 2013 CBX. For the students taking the CBX three years later in 2016, that average fell to 157.3. While only an average 2.1-point decrease in LSAT, the difference represents a Stddif of about one-third. The size of the difference was more pronounced in the lower quartiles and was consistent for the 2013 to 2016

⁹ UGPAs are cast in the original format in which they were received.

and 2013 to 2017 comparisons. The Stddif for the 2013 to 2016 comparison for both the lower and median quartiles were the same size as those observed in overall CBX performance.

Table III.4

***Entering Law School Credentials of Students from Participating Schools
by the Year They Sat for the CBX***

	<u>Exam Year</u>			<u>Stdzd Difference</u>	
	<u>2013</u> (N=2,747)	<u>2016</u> (N=2,394)	<u>2017</u> (N=2,422)	<u>2013 to</u> <u>2016</u>	<u>2013 to</u> <u>2017</u>
<u>Undergrad GPA</u>					
<i>1st Quartile</i>	3.18	3.11	3.11	-0.18	-0.18
<i>Median</i>	3.47	3.41	3.41	-0.16	-0.16
<i>3rd Quartile</i>	3.68	3.64	3.65	-0.11	-0.08
<i>Ave.</i>	3.40	3.35	3.35	-0.13	-0.13
<i>Sd.</i>	0.38	0.38	0.40		
<u>LSAT</u>					
<i>1st Quartile</i>	155	152	152	-0.48	-0.48
<i>Median</i>	160	157	157	-0.48	-0.48
<i>3rd Quartile</i>	164	162	162	-0.32	-0.32
<i>Ave.</i>	159.4	157.3	157.1	-0.34	-0.37
<i>Sd.</i>	6.2	6.4	6.6		
<u>Undergraduate Major</u>					
<i>Social Science</i>	46.9%	49.9%	52.2%		
<i>Arts & Humanities</i>	33.9%	31.3%	31.4%		
<i>Business</i>	9.6%	10.4%	8.1%		
<i>All Other</i>	9.6%	8.5%	8.3%		
<i>Natural Science</i>	4.3%	3.7%	3.3%		
<i>Computer Science</i>	0.0%	0.1%	0.2%		
<i>Engineering</i>	2.4%	1.1%	1.0%		
<i>Health</i>	0.3%	0.2%	0.4%		
<i>Other</i>	2.7%	3.5%	3.5%		

Taken together, these findings suggest that students who took the 2016 and 2017 CBX (and matriculated primarily in 2013 and 2014) had somewhat lower entering credentials than the students sitting for the 2013 administration (matriculating in 2010). And the distributional statistics suggest that a larger group of lower-credentialed students were admitted in the 2013 and 2014 classes.

With respect to undergraduate major, we see that the majority of entering students came to the law schools from either the Social Sciences or Arts & Humanities. Together, these majors comprised 81% of all entering students sitting for the 2013 and 2016 CBXs, and 84% sitting for the 2017 CBX. Business majors comprised between 8% to 10% of the sample for the three years, while no other major made up more than 4%. Matriculants from the hard sciences or engineering were rare, and there was very little year-over-year variation in the composition.

Law School Experience. Table III.5 presents data on some variables that reflect the students' experience while in law school. Not all schools reported student data for each of the variables, but when they did, they generally reported for each year.

Table III.5

***Characteristics of Students Relating to Their Experience While in Law School
by the Year They Sat for the CBX***

<u>Educational Experience</u>	<u>Exam Year</u>		
	<u>2013</u> <u>(N=2,747)</u>	<u>2016</u> <u>(N=2,394)</u>	<u>2017</u> <u>(N=2,422)</u>
<i>Part Time</i>	10.5%	12.3%	11.8%
<i>Transferred In *</i>	8.0%	6.3%	6.2%
<i>In Regular Day Program**</i>	86.9%	84.1%	84.2%
<i>Had a Field of Concentration ***</i>	24.9%	27.1%	27.0%
<i>Graduated within 3 years of Matriculation</i>	97.6%	99.4%	99.4%

* One school did not report transfer status for its students.

** Six schools reported having students in some alternative to a regular day program.

*** Seven schools reported having students with an area of concentration.

The first variable, reported on by all schools, indicated whether the student took a reduced course load at the time of enrollment. Only six of the participating law schools reported any part-time students, and as a result, only 11% to 12% of the entire sample were not full-time. Students transferring into the participating schools comprised 8% or less of the sample, with only one institution reporting more than 10%. For schools offering a field of concentration as part of their curriculum, roughly 25% of the students graduated with such a designation. The percentages remained consistent over time. Table III.5 also shows that in the latter two years, less than 1% of the test-taking sample failed to graduate with their entering class. That percentage was only slightly higher for those taking the CBX in 2013. Further analysis revealed that approximately

90% of those who did not graduate with their graduating class still took the CBX within two years of graduating.

Law School Performance. Table III.6 presents distributional statistics on students' law school performance after their 1L year and upon graduation.¹⁰

Table III.6

***First Year and Final GPA Distributional Statistics
for Students from Participating Schools by the Year They Sat for the CBX***

<u>Grade Point Average</u>	<u>Exam Year</u>			<u>Stdzd Difference</u>	
	<u>2013</u> (N=2,747)	<u>2016</u> (N=2,394)	<u>2017</u> (N=2,422)	<u>2013 to</u> <u>2016</u>	<u>2013 to</u> <u>2017</u>
<i>First Year</i>					
<i>1st Quartile</i>	2.67	2.68	2.69	0.02	0.04
<i>Median</i>	3.00	3.01	3.00	0.02	0.00
<i>3rd Quartile</i>	3.35	3.33	3.33	-0.04	-0.04
<i>Ave.</i>	3.01	3.02	3.01	0.02	0.00
<i>Sd.</i>	0.47	0.46	0.46		
<i>Final</i>					
<i>1st Quartile</i>	2.87	2.88	2.84	0.02	-0.08
<i>Median</i>	3.16	3.15	3.14	-0.03	-0.05
<i>3rd Quartile</i>	3.44	3.43	3.43	-0.02	-0.02
<i>Ave.</i>	3.15	3.16	3.15	0.03	0.00
<i>Sd.</i>	0.40	0.39	0.40		

The results in Table III.6 indicate that there were essentially no differences in average student law school performance between any of the three CBX examination years under study, either upon completion of the first year of law school ($p=.439$) or upon graduation ($p=.335$). The average LSGPA in each year was essentially the same (3.15) with a constant Sd (.40). On average, LSGPA was consistently .14 points higher than the FYGPA (3.01). The overall FYGPA and LSGPA distributions were also nearly identical, as evidenced by the consistent grade at each quartile points for both the FYGPAs and LSGPAs.¹¹ Separate Analyses of

¹⁰ As the reader is most familiar with the standard 0 to 4 (4.3)-point scale, the statistics in Table III.6 are reported in the original GPA scale for illustrative purposes. A separate analysis conducted on the adjusted GPA scores showed a similar pattern.

¹¹ We recognize that not all students sitting for the CBX in a given year are part of the same matriculating class. However, analysis showed that between 85% and 90% of test-takers on each CBX administration matriculated within +/- one year of each other.

Variance conducted for each participating law school found no statistically significant difference in the average FYGPA or LSGPA between the three years ($\alpha=.05$).

We suspect that this finding relates to the practice of “grading on the curve,” whereby students in a given year are evaluated based on their performance relative to other students in that year rather than against some absolute standard.

In summary, over the time spanning the three CBX administrations, the population of examinees from the participating law schools aged somewhat, was no longer predominantly male, and was comprised of a higher proportion of minorities. In terms of the population’s credentials upon entering law school, their UGPAs exhibited a slight downward trend, while their LSATs decreased more sharply. This decrease in LSAT was evidenced by the 1/2 Stddif drop in both the median and bottom quartile LSAT scores from the 2013 CBX cohort to the 2016 and 2017 cohorts.

No readily identifiable changes in the educational experiences of the students over the three-year period could be identified based on the available measures, and on average, no difference was observed in their law school performance as measured by either their FYGPA or LSGPA, a possible result of “grading on the curve.”

Research Question 3: To what degree were these students’ characteristics, credentials, law school experiences, and performance independently related to their outcomes on the CBX? Did the relationships remain consistent over the three administrations?

The factors reported on in the previous section are of particular interest in that they are temporal antecedents to students’ CBX experience. While not necessarily causal in nature, if it could be demonstrated that they exhibited some relationship to students’ eventual performance on the CBX, knowledge of the behavior of these factors could help begin to explain differences in CBX outcomes between the administrations. Additionally, if the relationships were found to be stable and consistent over time, this would provide further support of their influence on these outcomes. Other research has demonstrated that many of the factors considered here have previously shown varying degrees of relationship to bar examination results. However, the research has been limited in that it occurred in restricted samples (e.g., a single law school), was restricted to a single bar examination administration, or focused only on pass rates (as opposed to actual scores). We are unaware of any published research that has simultaneously studied these relationships across multiple bar examination outcomes, across multiple institutions, and over a prolonged time period. This section of the report presents findings on each of these issues. In this section, we report on the statistical relationships between the factors discussed in the previous section and performance on the CBX as measured by the scale scores (WRTSCL, MBESCL, TOTSCL) on the respective test sections and final P/F status.

The methodology for conducting these analyses is discussed in detail in Appendix 11.

Relationships Between Student Characteristics and CBX Outcomes: Method 1 (Categorical Measures).

Table III.7 presents a summary of the 52 GLM models used to evaluate the relationships between the antecedent student characteristics and CBX outcomes. As detailed in Appendix 11, the “Main Effect” in each model evaluated whether there was a statistically significant relationship between the characteristic and the respective CBX outcome, while the “Interaction Effect” indicated whether the relationship did or did not vary by CBX administration. The entries in Table III.7 represent the statistical likelihood that the respective relationship could be interpreted to have occurred by chance. The R^2 variable provides an indication of the percentage of the variation in the CBX outcome that could be “explained” or “accounted for” by the student attribute; the higher the R^2 value, the stronger the relationship.

As an example, in Table III.7, UGPA was found to have a relationship with the MBE. The chances that the relationship occurred by chance was less than .001. By itself, the relationship accounted for 6.2% of the variation in MBESCL. The N.S. in the “Intret” (Interaction) column indicates that there was a non-statistically significant interaction between the administration year

and UGPA. This finding implies that the relationship between UGPA and MBE was statistically stable for each administration.

An inspection of Table III.7 immediately reveals that none of the tests resulted in a statistically significant interaction of the CBX administration year and the student characteristic for any of the CBX outcomes. *From this finding, we conclude that the degree of relationship that did or did not exist between the student characteristic and CBX performance did not change over the three administrations under study.*

To illustrate this further, Table III.8 presents the example of CBX TOTSCS statistics for each administration separately for minority and non-minority applicants.¹² Statistics in Table III.8 reveal that non-minority applicants consistently scored higher than minorities on each of the three CBX administrations (49, 53 and 43 points in 2013, 2016, and 2017, respectively). Statistics from Table III.7 indicate that those differences are statistically significant. However, the results in Table III.7 also point to the fact that the size of those differences were statistically equivalent from year-to-year, as indicated by the lack of a significant interaction, and that any observed changes in the size of the differences between minority and non-minority examinees were due to chance alone. The standardized differences calculated between the two groups in Table III.7 illustrates this even more clearly, revealing that the maximum variation between them was only .07 Sd units.

Inspection of the “Main Effects” columns in Table III.7 *indicate that ten out of the 13 student characteristics were found to be statistically related to the CBX outcomes. Further, those relationships, while different in their relative magnitudes, were present for each of the four CBX metrics (i.e., MBESCL, WRTSCL, TOTSCS, and P/F Status).* The only characteristic for which this was not the case was examinee gender. Gender was found to be strongly related to MBESCL, only marginally related to WRTSCL, but not related to overall scores or P/F status. The three non-significant antecedent/CBX relationships were related to variables (transfer status, graduated within three years of matriculation, and had a field of concentration) intended to capture the law school experience. As referenced in Table III.7 footnotes, two of these variables had only sparsely reported data.

The difference in the strength of the various relationships can be seen most clearly in the R^2 values. Not unexpectedly, and consistent with available past research on student credential/bar performance relationships, the variables measured on the continuous scales (UGPA, LSAT, FYPA, and LSGPA) resulted in the larger R^2 values.

¹² A summary of the average and standard deviations of CBX scores and passing rates for each stratification of all non-continuous student characteristic variables for each year is provided in Appendix 9 for reference purposes.

Table III.7

Results of GLM Tests Evaluating Relationships of Student Characteristics to CBX Performance

<u>Student Characteristic</u>	<u>MBE</u>			<u>Written</u>			<u>Total</u>			<u>Pass/Fail</u>		
	<u>R²</u>	<u>Main ^a</u>	<u>Intrc t^b</u>	<u>R²</u>	<u>Main ^a</u>	<u>Intrc t^b</u>	<u>R²</u>	<u>Main ^a</u>	<u>Intrc t^b</u>	<u>R²</u>	<u>Main ^a</u>	<u>Intrc t^b</u>
<u>Baseline (CBX Year)</u>	1.7%			2.1%			2.4%			1.9%	-	-
<u>Demographic</u>												
<i>Age</i>	3.1%	<.001	N.S.	9.0%	<.001	N.S.	7.6%	<.001	N.S.	6.0%	<.001	N.S.
<i>Gender</i>	3.2%	<.001	N.S.	2.5%	<.001	N.S.	2.4%	N.S..	N.S.	1.9%	N.S..	N.S.
<i>Ethnicity</i>	5.4%	<.001	N.S.	4.3%	<.001	N.S.	5.7%	<.001	N.S.	3.9%	<.001	N.S.
<u>Entering Credential</u>												
<i>Major</i>	3.0%	<.001	N.S.	3.6%	0.009	N.S.	4.1%	<.001	N.S.	3.1%	N.S..	N.S.
<i>UGPA</i>	6.2%	<.001	N.S.	8.6%	<.001	N.S.	9.4%	<.001	N.S.	6.2%	<.001	N.S.
<i>LSAT</i>	18.5%	<.001	N.S.	11.7%	<.001	N.S.	17.1%	<.001	N.S.	11.3%	<.001	N.S.
<u>Law School Status/Experience</u>												
<i>Part Time Student</i>	2.9%	<.000	N.S.	4.5%	<.001	N.S.	4.7%	<.001	N.S.	3.9%	<.001	N.S.
<i>Transferred In ^c</i>	1.9%	N.S..	N.S.	2.5%	N.S..	N.S.	2.8%	N.S..	N.S.	2.1%	N.S..	N.S.
<i>In Regular Day Program ^c</i>	3.3%	<.001	N.S.	4.6%	<.001	N.S.	5.0%	<.001	N.S.	4.1%	<.001	N.S.
<i>Had a Field of Concentration ^c</i>	2.4%	N.S..	N.S.	2.8%	N.S..	N.S.	3.2%	N.S..	N.S.	2.3%	N.S..	N.S.
<i>Graduated within 3 years</i>	1.8%	N.S..	N.S.	2.3%	N.S..	N.S.	2.6%	N.S..	N.S.	2.0%	N.S..	N.S.
<u>Law School Grade Point Ave.</u>												
<i>First Year</i>	31.8%	<.001	N.S.	29.0%	<.001	N.S.	36.0%	<.001	N.S.	24.3%	<.001	N.S.
<i>Final</i>	38.1%	<.001	N.S.	34.8%	<.001	N.S.	44.0%	<.0002	N.S.	30.6%	<.001	N.S.

^a p-value associated with main effect of student characteristic on CBX outcome

^b p-value associated with interaction of administration year and student characteristic on CBX outcome; N.S. = Not Significant at $\alpha < .01$.

^c Variable not reported on by all participating students

Table III.8

***Average and Standard Deviation of CBX Total Scale Scores
by Racial/Ethnic Status and Examination Year***

<i>Race/Ethnicity</i>	<i><u>2013</u></i> <i><u>(N=2,640)</u></i>			<i><u>2016</u></i> <i><u>(N=2,331)</u></i>			<i><u>2017</u></i> <i><u>(N=2,329)</u></i>		
	<i><u>%</u></i>	<i><u>Ave</u></i>	<i><u>Sd</u></i>	<i><u>%</u></i>	<i><u>Ave</u></i>	<i><u>Sd</u></i>	<i><u>%</u></i>	<i><u>Ave</u></i>	<i><u>Sd</u></i>
	<i><u>N</u></i>			<i><u>N</u></i>			<i><u>N</u></i>		
<i>Non-Minority</i>	61%	1,529	130	56%	1,484	132	55%	1,495	135
<i>Minority</i>	38%	1,480	126	43%	1,431	128	44%	1,452	120
<i>Total</i>	100%	1,510	131	100%	1,461	133	100%	1,476	130
<i><u>Difference</u></i>									
<i>Raw</i>	49			53			43		
<i>Standardized</i>	0.37			0.40			0.33		

Table III.9 further illustrates the association between antecedent credentials and CBX outcomes by showing how examinees with scores in different ranges of the LSAT, performed on the CBX during each administration.¹³ For example, Table III.9 shows that on the 2013 CBX administration, roughly 20% of examinees scored less than 154 on the LSAT and earned an average of 1,420 on the MBE. The next 20% of the examinees (scoring between 154 and 158 on the LSAT), averaged 1,474 on the MBE (54 points higher). On average, in the top three LSAT ranges, examinees scored 35, 34, and 41 points higher, respectively. This trend is also reflected in the 2013 passing rate, though it did plateau at an LSAT of 162 where applicants passed at roughly an 85% rate.

Examining the same set of scores for the 2016 administration, we see a similar pattern of an increase in scores from the lowest LSAT range to the top. However, we did observe some interesting differences from the 2013 administration. First, a much larger portion of all applicants had scores of less than 154 on the LSAT (31% versus 19% in 2013), and their average MBE performance was lower (1,388 vs. 1,420). The average 2016 MBESCL were lower than the 2013 MBESCL across the LSAT score ranges. This difference is also reflected in the differences in passage rates between 2013 and 2016 within each of the score ranges.¹⁴ *Thus, in 2016, we see more examinees in these lower credential ranges with poorer scores than in 2013.*

¹³ The LSAT ranges were formed by placing examinees into one of five “quintiles” (i.e., equal sized groups representing roughly 20% of the overall sample) based on the 2013 sample.

¹⁴ Similar tables to Table III.9 for UGPA and law school grades are included in Appendix 10 as additional examples and for reference later in the report.

Table III.9

***CBX Performance Statistics on the 2013, 2016, and 2017 Administrations
for Examinees Scoring within LSAT Score Ranges ^a***

	<u>MBE</u>									<u>Written</u>						<u>Total Score</u>						<u>Pass Rate</u>		
	<u>2013</u> (N=2,675)			<u>2016</u> (N=2,327)			<u>2017</u> (N=2,351)			<u>2013</u>		<u>2016</u>		<u>2017</u>		<u>2013</u>		<u>2016</u>		<u>2017</u>		<u>2013</u>	<u>2016</u>	<u>2017</u>
	<u>%</u>	<u>Ave.</u>	<u>Sd</u>	<u>%</u>	<u>Ave.</u>	<u>Sd</u>	<u>%</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>%</u>	<u>%</u>	<u>%</u>
<u>LSAT Range</u>																								
<i>< 154</i>	19%	1,420	125	31%	1,388	122	33%	1,405	124	1,456	129	1,396	111	1,438	128	1,443	112	1,393	102	1,422	111	52%	32%	46%
<i>154-158</i>	24%	1,474	131	25%	1,457	132	24%	1,461	127	1,488	140	1,452	134	1,468	136	1,483	123	1,454	120	1,465	118	65%	56%	62%
<i>159-161</i>	19%	1,509	127	16%	1,489	129	17%	1,500	127	1,511	140	1,487	151	1,503	153	1,510	120	1,488	130	1,501	128	75%	64%	70%
<i>162-164</i>	20%	1,543	118	15%	1,514	123	13%	1,513	135	1,551	142	1,514	156	1,520	147	1,548	119	1,514	132	1,517	128	85%	74%	78%
<i>>164</i>	20%	1,584	128	13%	1,558	129	14%	1,577	130	1,571	155	1,551	155	1,556	152	1,576	129	1,553	135	1,567	127	84%	81%	85%
<i>All</i>	100%	1,506	138	100%	1,462	139	100%	1,472	140	1,515	148	1,462	147	1,483	146	1,512	129	1,462	132	1,477	130	72%	56%	63%

^c Score ranges based on quintiles from the distribution of LSAT scores of students sitting for the 2013 CBX.

Relationships Between Student Characteristics and CBX Outcomes: Method 2 (Continuous Measures).

Results from the models discussed in the previous section indicated that relationships between many of the antecedent variables measured on a *categorical* scale and CBX outcomes were statistically significant and stable across administrations. Relationships of student credentials measured on a *continuous* scale (i.e., LSAT and the various GPAs) with CBX outcomes were reexamined using the Pearson correlation coefficient. Correlations were calculated for each administration. The correlations represented the degree of linear relationship throughout the entire score range, rather than in the discrete categories examined in the previous section. These correlations are presented in Table III.10.

Table III.10

Correlations Between Entering Law School Credentials, Law School Grades, and CBX Outcomes from the 2013, 2016, and 2017 Administrations

<i><u>Metric</u></i>	<i><u>MBE</u></i>			<i><u>Written</u></i>			<i><u>Total</u></i>			<i><u>Pass Rate</u></i>		
	<i><u>2013</u></i>	<i><u>2016</u></i>	<i><u>2017</u></i>	<i><u>2013</u></i>	<i><u>2016</u></i>	<i><u>2017</u></i>	<i><u>2013</u></i>	<i><u>2016</u></i>	<i><u>2017</u></i>	<i><u>2013</u></i>	<i><u>2016</u></i>	<i><u>2017</u></i>
<i>UGPA</i>	.212	.199	.234	.299	.248	.228	.300	.252	.255	.226	.217	.199
<i>LSAT</i>	.424	.433	.427	.284	.370	.286	.368	.428	.392	.275	.358	.298
<i>FYGPA</i>	.582	.550	.563	.529	.545	.521	.609	.595	.597	.465	.488	.469
<i>LSGPA</i>	.640	.606	.617	.606	.609	.583	.687	.662	.662	.537	.551	.519

All correlations were found to be statistically different from zero ($p < .001$), *suggesting that both pre-matriculation credentials and performance while in law school had a significant linear relationship with CBX outcomes.*

In terms of the magnitude of those relationships, the temporal proximity of the performance measure to the time that the student sat for the CBX makes a difference. UGPA, a measurement earned at least three years preceding the bar exam, demonstrated the weakest relationships with CBX outcomes ($r = .199$ to $.300$), while students' LSGPA exhibited the strongest relationship ($r = .519$ to $.687$). We also observed that all metrics tend to correlate more highly with the TOTSCL than with the individual section scores or P/F status, most likely a function of the higher reliability of that measure. Figure 2.2 presents a visual representation of these relationships and the differences in their magnitude. The values of the various credential/CBX

outcome correlations are consistent with the findings of previous bar examination research in California (Klein & Bolus, 1997), New York (Kane, Mroch et al. 2006) and Texas (Klein & Bolus, 2004; Austin et al., 2017).

Using the statistical methods described by Steiger (1980), we then tested the stability of these relationships over the different administrations by comparing the correlations for the same two sets of variables (2013 versus 2016, 2013 versus 2017, and 2016 versus 2017).¹⁵ For example, for the FYGPA/CBX TOTSCS relationship, we first compared the correlations .609 to .595 (2013 versus 2016), then .609 to .597 (2013 versus 2017), and then .595 to .597 (2016 versus 2017). A total of 28 tests were run.

Test results revealed that all but three of the 28 tests were found to be statistically non-significant ($\alpha=.01$). *This finding indicated that among the three CBX administrations, there were no statistical differences in the relationships between the CBX outcomes and student credentials or performance.* (This finding corroborated results from the preceding section where these measures were stratified and treated in discrete categories). The only exceptions were associated with the Written section on the 2016 examination. In that case, the correlations between the LSAT and WRTSCL during that year were .09 correlation points higher than in either 2013 or 2017. A similar difference (.07) was observed with the WRTSCL/ UGPA correlations in 2016.

In terms of the *interrelationships* among these antecedent measures, we first observed that the correlations among entering law school credentials and law school grades were statistically significant but small. For example, the overall correlation between student UGPA and FYGPA was only .19, rising to .24 for UGPA and LSGPA. The relationship of LSAT with FYGPA and LSGPA was only slightly higher (.29 and .28, respectively). The correlation between UGPA and LSAT was only .20. As noted in Klein & Bolus (1997), the low relationship between UGPA and LSAT can be explained by the fact that law school admissions policies often allow higher LSAT scores to compensate for lower UGPAs and vice-versa. Finally, we note that the correlation between FYGPA and LSGPA was .89. The relationship was consistent across the CBX administration samples and similar from law school to law school.¹⁶ The strength of the relationship was not surprising given that a major portion of the LSGPA is comprised of the FYGPA.

In summary, the results in this section point to the fact that there are student characteristics and metrics antecedent to students' CBX attempts that were clearly related to their eventual performance on the examination. Demographic attributes, entering credentials, selected aspects of the law school experience, and performance while in law school were all found to be related to performance on the CBX. Those relationships existed with each section of the CBX, as well as

¹⁵ A significant test result implied that the correlations were not equal; a non-significant result indicated that the hypothesis that the correlations were equal could not be rejected.

¹⁶ The correlation between the two GPAs were the same in their original (i.e., unadjusted) metric as well.

the TOTSCL and P/F outcome. While the various relationships differed in their magnitude, they tended to be consistent from one CBX administration to the next.

Figure 2.2.

Correlations of CBX Outcomes with Students' Entering Law School Credentials and Grade Point Averages by Administration Year

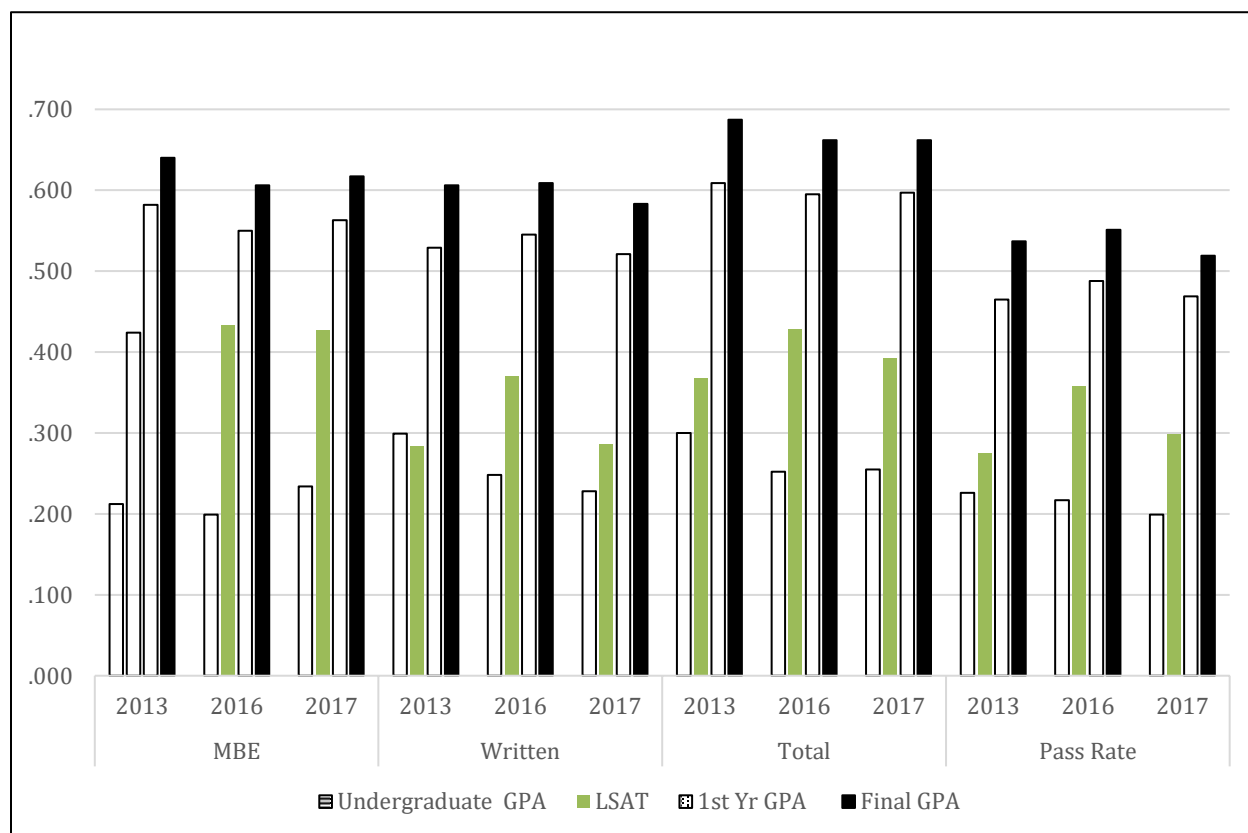
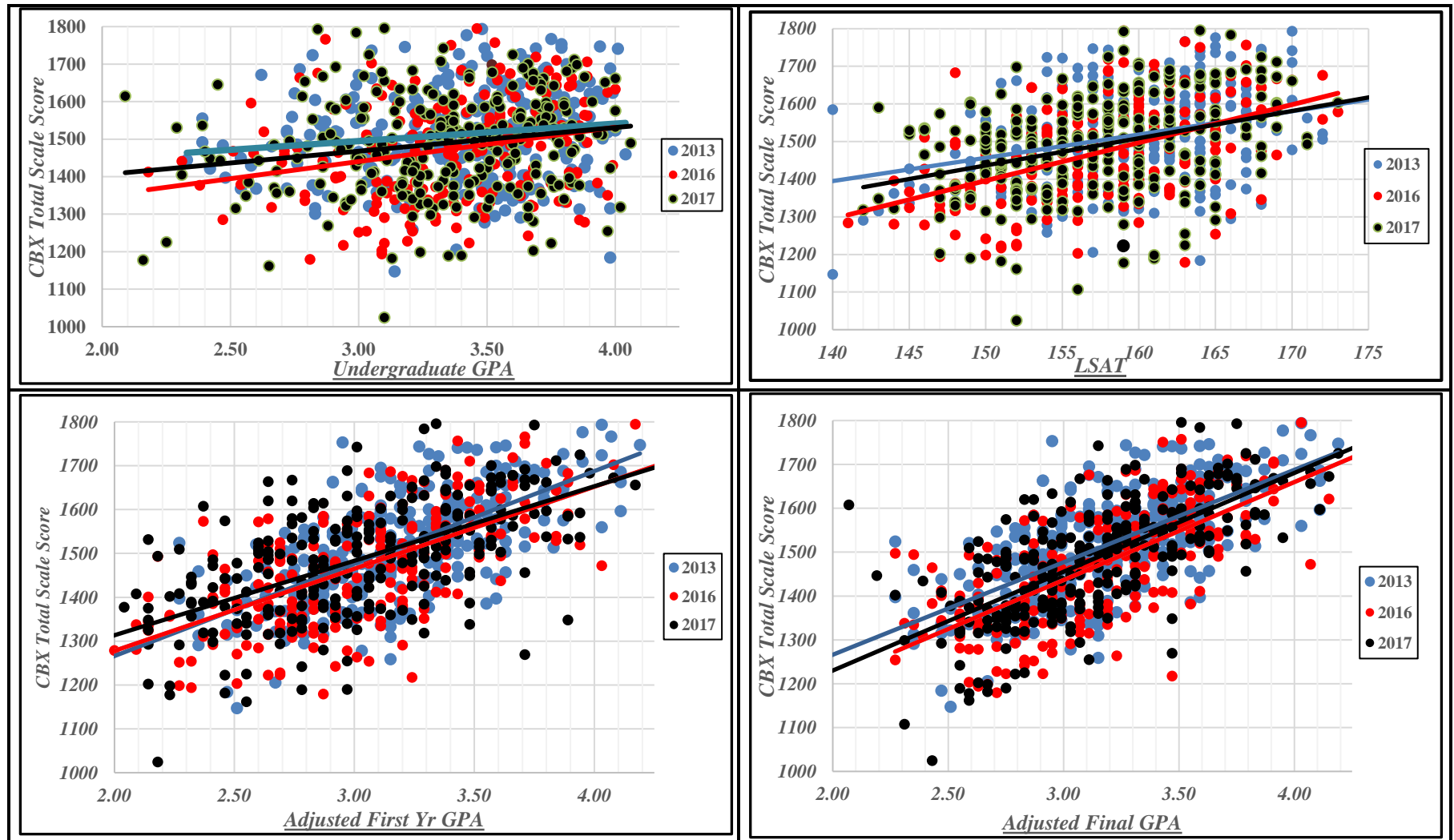


Figure 2.3 presents a series of scatterplots of LSAT and the various GPA measures with the CBX TOTSCL to illustrate the relationships, their relative strengths, and their consistency across administrations. The data in the scatterplots represent a 10% random sample of students from each administration (to make viewing easier), and each administration is represented by a different color. In addition, a least squares regression line as graphic representation of the correlations in Table III.10 and Figure 2.2 has been included to illustrate the similarity in the linear relationships between years.

The overlapping regression lines for the three administrations in each graph provide a visual representation of the statistical finding showing no significant differences in the size of the correlations. The increasing steepness of the slope of each of the lines represents the difference in the magnitude of the correlations, ranging from an almost flat line for the UGPA plot to a very steep line for LSGPA.

Figure 2.3

Scatterplots Showing the Relationships of CBX Total Scale Score with Entering Law School Credentials, FYGPA, and LSGPA



Research Question 4: To what degree do the interrelationships between students' characteristics, credentials, and law school experiences account for the differences in CBX performance over administrations?

The findings in the previous section clearly established that the many of the attributes and characteristics that students bring to the CBX are related to their eventual performance. However, the results also suggested that not all of those relationships are equally strong, nor are they the same for each CBX outcome. And additionally, most of these applicant characteristics were not necessarily independent of one another. For example, while both FYGPA and LSGPA were both individually highly correlated with scores on the CBX, they were almost perfectly correlated with each other ($r=.89$). The next analytic step therefore required us to systematically investigate the *joint relationship* that these antecedent variables had on CBX performance. To the degree that some combination of student credentials and characteristics were related to the outcomes and subsequently explained variability in CBX performance, they could subsequently be used to statistically “control” for potential pre-CBX differences that may have existed. By statistically removing their impact, CBX outcomes could be more accurately assessed, including the difference in performance over administrations.

Multivariate regression modeling techniques were systematically applied to the data in an attempt to control for these possible differences. Described more fully in Appendix 12, separate models were developed for each CBX scale score. The model development used a stepwise method to sequentially evaluate different “sets”¹⁷ of antecedent measures (along with other variables described in the Appendix). The variable sets were added in the order in which they would temporally occur (e.g., entering law school credentials preceded performance in law school). After all sets were entered, a final model with only statistically significant explanatory variables was created. The resulting models for each CBX outcome were then used to make year-over-year comparisons using “adjusted” outcomes.

The findings reported in this section provide summaries of the key steps in the modeling exercise that illustrate (1) the strength of the various models and variation in CBX performance that they account for, (2) which student variables remained significantly related to CBX performance when evaluated in combination with others, (3) the degree to which the significant metrics would be expected to affect outcomes, and (4) how the actual differences in CBX performance over the administrations compared to the adjusted differences.

Model Testing.

Table III.11 provides a summary of the stepwise testing results for each of the CBX outcomes.¹⁸

¹⁷ The variable sets were similar to those reported on in the previous section (e.g., student demographics, entering credentials, etc.).

¹⁸ See Appendix 11 for a detailed account of the methods applied to obtain these results.

Table III.11

Summary of R² Values for Regression Models Testing the Cumulative Impact of Potential Predictors of CBX Performance

	<u>Predictor Categories*</u>						
<u>CBX Outcome</u>	<u>Baseline: Admin Year Only</u>	<u>Applicant Demo-graphics</u>	<u>Entering Law School Credentials</u>	<u>Performance in Law School</u>	<u>Law School Attended</u>	<u>CBX Repeater Status</u>	<u>Final Model</u>
<u>Scale Score</u>							
MBE	1.8%	7.3%	23.7%	47.9%	49.8%	50.2%	50.1%
Written	2.3%	10.7%	19.4%	42.8%	44.4%	44.5%	44.3%
Total	2.7%	9.9%	23.8%	52.3%	54.3%	54.4%	54.3%
<u>P/F Status</u>	1.2%	3.1%	12.0%	31.1%	32.0%	33.6%	33.3%

*The percentages within each column represent the model R² value of the category and all categories preceding it.

The entries in Table III.11 present the percentage in the variation between the applicants' CBX scores that could be explained by the predictor category *inclusive of* the categories preceding it. The larger the percentage, the stronger the explanatory power of the model. The mathematical difference between 100% and the particular entry represents unexplained variability between applicant scores.¹⁹ For example, looking at CBX WRTSCL, we see that a knowledge of which administration an applicant sat for accounted for only 2.3% of the differences in applicants scores. Adding knowledge of the applicants' demographic characteristics and entering law school credentials increased the explanatory power almost 10-fold to 19.4%. Including those factors as well as knowledge of their performance in law school more than doubled that to 42.8%.

Inspection of Table III.11 sheds light on several facts regarding the relationships between the various categories and CBX outcomes.

First, we notice that the *models are generally better at explaining differences in TOTSCL than the CBX section scores*; and between the two section scores, the models are better at predicting MBESCL than WRTSCL. The reason for this is most likely due the relative reliability of each of these CBX scores. Historically, the TOTSCL and MBESCL reliability averages approximately .90 while WRTSCL reliability averages around .79. Explanatory capacity of these predictors is lowest for P/F status, owing to both the dichotomous nature of this outcome (i.e., yes versus no), and the fact that passing rates for these particular administrations were relatively close to the 50% to 60% levels where prediction is the most difficult.

¹⁹ Unexplained variability includes both possible measures that are not included and random effects.

Table III.11 also revealed a general pattern whereby the inclusion of additional categories continued to add to the strength of the explanatory models. During the modeling, the largest gains in explanatory power in CBX outcomes were first realized when entering law school credentials were considered. The combination of student demographics and pre-admission credentials, the metrics that students brought with them to law school accounted for approximately 24%, 19%, and 24% of the variability in CBX scores (MBESCL, WRTSCL, and TOTSCL, respectively). Then a rather substantial increase in explainable variation was observed when law school performance was factored in (additional R^2 increases of 24.2%, 23.4%, and 28.5% respectively for the same CBX scores and 19% for CBX passage rates). This finding suggests that performance while in law school plays the strongest role in predicting CBX performance, even after consideration of entering credentials, showing it to have a moderating impact on those credentials.

Consideration of the law school that students attended generally added an additional 2% to the explanatory power of the models. This addition was considered a statistically significant improvement in all models ($p < .0001$)²⁰. Finally, after considering all of the preceding factors, knowledge of previous examination attempts added little to nothing to the efficacy of the models. This final result suggests that the differences observed in repeaters versus first-timer CBX performance was generally explainable by these other antecedent factors.

The last column presented in Table III.11 represents the final statistical models derived for each CBX outcome after eliminating non-significant variables from each of the predictor categories. Because of high degree of collinearity (i.e., the interrelationship of the variables within and between the various categories), some predictors that were initially *independently* related to CBX outcomes no longer were found to be associated after factoring in the *joint* relationships with other variables²¹.

Model Outcomes.

Table III.12 presents the standardized effect sizes associated with each of the variables within each of the categories. The effect size is the regression coefficient reflecting the strength of association of each variable with the outcome, after factoring in its relationship with other variables in the model. The effects are reported in standardized format (as opposed to the initial

²⁰ Note that these findings do not imply that schools do not provide a value-add to their student's performance on the CBX. The grades that students earn in their respective institutions are clearly a function of the instruction that they receive. Results of more detailed analyses outside the scope of this report indicated that even after statistically controlling for other metrics we have been discussing, attendance at some schools did enhance the examinees' performance more than others.

²¹ After arriving at the "Final" models, we examined additional models that posited "higher-order" effects (i.e., interactions of different terms such as age by minority), derivatives effects (e.g., performance improvement in law school from 1L year to graduation), and non-linear associations (e.g., mathematically adjusting LSAT scores to evaluate the possibility of a more accelerated impact moving up the score range (rather than simply a straight-line relationship). None were found to statistically improve upon the final model.

metric) to allow for a direct comparison of the impact of the different variables.²² A positive value indicates that as the particular explanatory variable increased in size, so does the respective CBX outcome. Conversely, a negative value implies that as the value increases, the CBX outcome decreased. For Minority Status, negative values imply that being a minority was associated with lower expected performance, *all other things held equal*.

Table III.12²³

***Summary of Effect Sizes of the Explanatory Measures Appearing
in the Final Models Predicting CBX Performance***

<i>Predictor Category/ Variable</i>	<i><u>CBX Outcome</u></i>			
	<i><u>Scale Score</u></i>			<i><u>Status</u></i>
	<i><u>MB</u></i>	<i><u>Written</u></i>	<i><u>Total</u></i>	<i><u>P/F</u></i>
<i><u>Demographic</u></i>				
<i>Age</i>	<i>N/S</i>	<i>-.087</i>	<i>-.085</i>	<i>-.135</i>
<i>Minority Status</i>	<i>-.040</i>	<i>N/S</i>	<i>-.027</i>	<i>N/S</i>
<i>Gender (Female)</i>	<i>-.093</i>	<i>N/S</i>	<i>N/S</i>	<i>N/S</i>
<i><u>Entering Law School Credential</u></i>				
<i>UGPA</i>	<i>N/S</i>	<i>N/S</i>	<i>.019</i>	<i>N/S</i>
<i>LSAT</i>	<i>.178</i>	<i>.086</i>	<i>.115</i>	<i>.167</i>
<i><u>Law School Performance</u></i>				
<i>First Year GPA</i>	<i>N/S</i>	<i>N/S</i>	<i>N/S</i>	<i>N/S</i>
<i>Final GPA</i>	<i>.572</i>	<i>.477</i>	<i>.606</i>	<i>.872</i>
<i><u>CBX Repeater Status</u></i>	<i>.074</i>	<i>N/S</i>	<i>.041</i>	<i>N/S</i>

N/S indicates that the variable was not included in the final model.

What is readily apparent from the results was the overwhelming importance of the aggregate performance in law school as measured by the students' cumulative GPA upon graduation. For each CBX outcome, LSGPA dwarfs the effects of all remaining potential predictors. The finding is entirely consistent with previously cited research, even in those instances where the same set of factors available in this study were not available. The size of these effect, ($\beta = .572$, $.541$, and $.591$ for the CBX scores, and $.477$ for final CBX status) suggested that for each 1/2 Sd increase

²² A standardized coefficient refers to how many standard deviation units the CBX outcome will change per unit standard deviation change in the predictor variable

²³ Table III.12 excludes the year effect, which is discussed later, and individual school effects to protect the anonymity of participating institutions.

in the “adjusted” LSGPA realized by a student, their performance on the CBX would be expected to increase by 1/2 Sd on the 2000-point CBX scale (discussed further in the next section).

Also apparent from this table is the lack of significant effect of the FYGPA, *after* consideration of the LSGPA. As mentioned previously, the extremely high correlation between these two factors foreshadowed the fact that only one would carry the law school performance effect. Additionally, the true underlying relationship of the FYGPA with CBX performance may have been attenuated by the fact that the lower end of its distribution has been truncated as a result of academic dismissal.

In terms of the demographic variables, age of the student at the time they sat for the CBX was found to have a small negative effect on CBX performance, and this effect seemed to be operating through its impact on the Written section ($\beta = -.136$). Older applicants tended to perform more poorly on that section, translating into slightly lower TOTSCl ($\beta = -.075$) and subsequently, lower chances of passing ($\beta = -.087$). This age-related effect was not present on the MBE. With respect to gender, the actual differences observed between males and females on their MBESCL and WRTSCL were strong enough to carry forward, even after their non-CBX performance credentials were factored in. However, the lack of a gender effect on TOTSCl or P/F status suggests that the section effects cancel each other. Finally, the analysis revealed a very slight negative racial/ethnic effect on the MBE ($\beta = -.04$), suggesting that minorities performed a bit worse on the MBE than non-minorities. This translated into a small impact on TOTSCl but not on actual differences in passing the CBX.

Care should be taken to not over-interpret these smaller effects or construe them to be indications of bias in the CBX.

During the multivariate modeling, UGPA retained a slight positive statistical relationship with TOTSCl ($\beta = .022$) but not with either section independently or resulting P/F decisions. LSAT, on the other hand, did maintain its significant relationship to all CBX scores and P/F decisions, though in a diminished capacity of its independent relationship.

To further illustrate the relative impact of each of these measures on the CBX outcomes, we stratified the significant metrics into discrete categories and reran the multivariate models. This approach provided an alternative insight into how a change in group membership (e.g., male versus female) or improvement on some antecedent performance metric (e.g., moving from the middle of the GPA distribution up one quintile) might be expected to have impacted the CBX TOTSCl or bar passage rates. Table III.13 presents the analysis results.

The entries in the tables are referred to as “raw” regression coefficients and indicate the expected number of additional points that would be added to or subtracted from to the CBX outcome if an

examinee was a “member” of the particular group, *all other things held equal*.²⁴ The magnitude of the effect is reflected in the absolute number of points. For example, an examinee who was 25 years old or less would be expected to have about a 56-point increase in their WRTSCL, while an older examinee who was 28 to 29 would be expected to have less than half that (i.e., 24.4-points). An even older examinee would be expected to have no additional points added. The gender differences noted in previous sections is illustrated in terms of the 25-point expected decrease on the MBE section for female examinees and the 16-point increase expected on the Written section. These expected differences netted out to a non-significant impact on the resulting TOTSCL and CBX P/F status, whereas the 13-point decrease expected for minorities on the MBE (couple with no expected racial/ethnic impact on the Written section) results in an 8-point expected decrease in the TOTSCL. *As observed previously, there was no statistically significant effect of race on final P/F status after controlling for other measures in the model.*

The relative strength of the antecedent performance credentials can be seen when comparing UGPA to either LSAT or the LSGPA. When considered in the context of other explanatory variables, UGPA did not predict MBESCL or WRTSCL, but it did have the slightest effect on TOTSCL. The added impact of moving from the bottom of the UGPA range (i.e., less than 3.10) to the top of the range (> 3.72) on TOTSCL was only 5.5 points. Compare this to the 44 additional TOTSCL points earned moving from the bottom quintile of the LSAT range (< 154) to the top quintile (>164). The difference in the LSAT/MBE and LSAT/Written relationships is also apparent from this table, as evidenced by the expected gains in the respective CBX outcomes. Performers with LSAT scores greater than 164 were expected to gain an additional 68 scale score point on the MBE and less than half that amount on the Written section.

The most striking finding in Table III.13 is the extreme impact that being in the top 20% of the graduating GPA distribution had on all CBX outcomes as compared to the lower quintiles. For example, students in this group were expected to earn more than 220 additional scale score points on each section of the CBX as compared to only 58 to 54 additional scale score points if they were in the second lowest quintile (note that adjusted GPA's below 2.80 represent the first quintile).²⁵ The similarity of the effect on each of the CBX section scores and overall scores is also quite notable.

²⁴ Note that these coefficients are “point estimates,” meaning that the number is the center point of a potential range. Because the coefficients are statistically significant and the number of examinees used in the analysis, the range is relatively small.

²⁵ Recall that these are adjusted GPAs and that the results were reported across all the participating schools. These relationships may not necessarily hold for an individual school.

Table III.13

Raw Regression Coefficients for Predictor Variables of CBX Outcomes

<u>Predictor</u>	<u>CBX Outcome</u>			
	<u>Scale Score</u>			<u>P/F</u>
	<u>MBE</u>	<u>Written</u>	<u>Total</u>	<u>Status</u>
<u>Age</u>				
<=25	*	56.3	33.7	9.2%
26-27	*	45.7	26.2	8.2%
28-29	*	24.4	12.6	5.0%
<u>Gender</u>	-25.5	16.4	*	*
<u>Minority Status</u>	-13.2	0.0	-8.1	*
<u>UGPA</u>				
3.10-3.36	*	*	1.5	*
3.37-3.55	*	*	4.9	*
3.56-3.72	*	*	4.9	*
>3.72	*	*	5.1	*
<u>LSAT</u>				
154-158	26.0	6.2	14.8	5.4%
159-161	37.0	15.1	24.7	7.5%
162-164	47.1	22.1	32.8	11.7%
>164	68.1	25.5	43.6	9.4%
<u>Adj. LSGPA</u>				
2.80-3.03	58.7	56.3	55.8	22.5%
3.04-3.27	103.4	98.9	99.3	39.0%
3.28-3.51	159.3	150.2	151.9	55.7%
>3.51	226.7	227.3	224.4	66.2%
<u>Repeater</u>	20.3	*	6.8	*

* Not statistically significant

Evaluating “Adjusted” CBX Performance Differences.

The models developed and described in the previous section were then used to re-examine the differences in CBX performance over time reported in the beginning of the Results section. By statistically controlling for the various antecedent attributes and credentials remaining in the models, a comparison of the “adjusted” (also referred to as “predicted”) outcomes could be

compared over time by means of an Analysis of Covariance (see Appendix 11). Essentially, this technique allows for a comparison in CBX performance after holding the effects of the significant antecedent variables constant across the three administrations.

Table III.14 presents the results of the actual and adjusted (predicted) comparisons of the differences in CBX performance on the three administrations.

Table III.14
Unadjusted vs. Adjusted Scale Score Differences in CBX Performance
on the 2013, 2016, and 2017 Administrations

<u>Year</u>	<u>Actual</u>		<u>Adjusted</u>		<u>Impact of Adjustment</u>	
	<u>Mean</u>	<u>Diff. from 2013</u>	<u>Mean</u>	<u>Diff. from 2013</u>	<u>Absolute Impact</u>	<u>Percentage Impact</u>
<u>MBE</u>						
2013	1,507		1,497			
2016	1,463	-44	1,468	-29	-15	34%
2017	1,471	-36	1,477	-20	-16	44%
<u>Written</u>						
2013	1,518		1,512			
2016	1,463	-55	1,465	-47	-8	15%
2017	1,482	-36	1,487	-25	-11	30%
<u>Total</u>						
2013	1,514		1,506			
2016	1,463	-51	1,466	-40	-11	22%
2017	1,477	-37	1,482	-25	-12	32%
<u>Pass Rate</u>						
2013	72.9%		70.2%			
2016	55.7%	-17.2%	56.8%	-13.4%	-3.8%	22%
2017	63.0%	-9.9%	65.3%	-4.9%	-5.0%	51%

α Impact of adjustment on differences between 2013 administration and subsequent administrations

β Absolute impact expressed in terms of 2013 Sd units.

Table III.14 contains the mean scale score performance on each section of the CBX, on the TOTSCL, and the CBX passage rate in both actual and adjusted forms. For each form, the table presents the mean differences between the 2013 administration and both the 2016 and 2017

administrations. In the final two columns, the difference (i.e., “impact”) in the between year comparisons is presented in both absolute (scale score and passage rate) and percentage formats.

By factoring in antecedent variables, the differences in CBX performance over time were reduced. The difference in 2013 adjusted mean MBE performance and 2016 adjusted mean MBE performance was roughly 29 points (1497 – 1468), compared to an actual difference of 44 points (1,507-1,463). Similarly, the difference in 2013 adjusted mean MBE performance and 2017 adjusted mean MBE performance was 20 points (1,497 – 1,477), compared to an actual difference of 36 points (1,507-1,471). Thus, the size of the MBE difference between the 2013 administrations and the latter two administrations was reduced by 15 and 16 points, respectively. Expressed in terms of percentages, 34% of the differences between 2013 and 2016 MBE performance could be attributed to the differences in the various student characteristics and credentials included in the model, while almost 45% of the differences between 2013 and 2017 MBE performance could be explained by differences in those same characteristics.

While there were similar effects due to the adjustments on the Written section of the CBX, they were much less pronounced. The difference between the actual and adjusted mean WRTSCL in the 2013 to 2016 comparison was reduced by only 8 scale score points (15%), and 11 scale score points for the 2013 to 2017 (30%) comparison. We attribute some of the differences between the MBESCL and WRTSCL impacts to the rather large difference in their respective reliabilities.

The net impact of the adjustments to each of the CBX sections is captured in the TOTSCL. While actual mean TOTSCL dropped by 51 points between 2013 and 2016, the difference in the adjusted scores for those two administrations was only 40 points. Thus, we conclude that slightly more than 1/5 of the observed decrease in CBX performance between 2013 to 2016 could be attributed to differences in the student characteristics. The same analyses for the passing rates showed that the 17.2% decrease in CBX passage rates between 2013 and 2016 was adjusted to a 13.4% decrease, a 3.8% absolute change, and a 22% relative decrease. The difference between 2013 and 2017 actual and adjusted decreases was more pronounced. The adjusted pass rate differences between 2013 and 2017 was estimated to be slightly less than 5% as compared to an actual difference of 10%, suggesting that the differences in the various student antecedent attributes accounted for 50% of the decrease.

These analyses helped to explain a reasonable portion of the differences in each of the CBX performance measures between the 2013 and both the 2016 and 2017 examinations. *However, a substantial portion of the difference still remained unexplained, and subsequent analyses on the adjusted scores revealed that there still remained a statistically significant decrease over the examination periods even after the adjustments ($p < .001$). These remaining differences could not be accounted for by the available study data.* We will address this further in the Summary and Discussion section at the end of the report.

In addition to results from the full models discussed in this section, in which all antecedent factors were controlled simultaneously, there was interest in identifying the unique impact of entering law school variables (i.e., demographics and credentials as measured by UGPA and LSAT separate from law school credentials (as measured by adj. LSGPA) on the CBX performance decline.

Isolating the differential impact of these two sets of credential variables, however, was hampered by two issues. The first was statistical in nature whereby the relationships between the different metrics and CBX outcomes most likely were impacted by the type of measurement (highly standardized in the case of (LSAT and bar exam scores) and non-standardized in the case of the other measures (UGPA and adj. LSGPA), and the resulting differences in the reliability of the measurements. The second issue was logical in nature with respect to the sequence of causal relationship from entering credentials to bar performance, with law school credentials playing a moderating role. That is to say, it is not reasonable to assume that the observed relationship between the pre-admission credentials and CBX performance is unaffected by the intervening law school instruction and subsequent performance. Due to these two issues, reliable and accurate estimates could not be unambiguously derived to distinguish the relative impacts of entering and law school credentials.

With these qualifications in mind, we did however attempt to estimate the impact of the pre-admission variables, by applying the same modeling approaches describe above. We first attempted to isolate the impact of adj. LSGPA on the decreases in CBX performance. We then reasoned that mathematically, the remainder of the percentage impact calculated in the full model (from Table III.14) could be attributed to pre-admission credentials and characteristics. Focusing on the 2013 to 2016 CBX performance decreases, the results of these analyses suggested that (1) approximately equal parts of the percentage impact could be attributed to the pre and post admission variable sets, and (2) the findings were roughly the same for each of the CBX scale scores and bar passage rate.

Research Question 5: Does exposure to, and better performance in, selected law school courses lead to improved performance on the CBX?

The SAG and deans from the California law schools expressed interest in determining the degree to which classroom exposure to material covered on the CBX and performance in those classes eventually translated to enhanced performance on the CBX. They were also interested in exploring whether exposure to other course work, bar preparation classes, and clinical experiences might have a supplemental impact.

Course/Content-Specific Analyses.

We first evaluated whether classroom exposure and performance in *specific legal content areas* had a direct effect on eventual CBX performance on questions covering content in those same areas. To establish whether there was a unique and direct effect, we reasoned that at least two conditions must be met: (1) there must have been a *positive and consistent* relationship between classroom exposure/performance in the selected course areas and the corresponding content areas covered in the CBX; (2) that relationship should have *been stronger* than the relationship between course work in the area with *some unrelated* CBX content area. For example, to conclude that classroom instruction in Torts had a unique impact on CBX Torts-related content (1) the number of units and/or grades that students earned in their Tort course should correlate positively with their scores on CBX Torts-related essay questions and/or MBE Torts subtests, and (2) that relationship should be consistently higher than the relationship to performance on some unrelated CBX topic such as Contracts.

Student's course-specific data was provided by nine of the 11 law schools.²⁶ The schools provided both course GPA and the number of units in each of the 13 content areas that can be covered on the CBX.²⁷ For the three administrations under study, 12 of those subject matter areas were covered at least once in either an essay question or performance task.²⁸ One essay question and/or performance task was selected from the three administrations to represent CBX written performance in that content area. A second essay or performance task was randomly selected from the administration covering an unrelated subject. A similar process was followed using MBE subtests.²⁹

For each student who took at least one class in a given subject matter area, we constructed a set of scores representing (1) the number of units they took, (2) the "adjusted" grade they earned in

²⁶ Note that not all schools provided a complete set of class/course specific data. The analyses that follow were based on the available data.

²⁷ An essay may occasionally have content that crosses over with another subject area, and performance tasks can cover multiple subject matter areas.

²⁸ Trusts was not covered but analyzed in combination with Wills since several schools reported their course data in combination.

²⁹ Raw subtest scores (ranging from 1 to 32) covering six content areas were available for 2013 and percentile scores (ranging from 1 to 99) were available for seven subtest areas for 2017. Civil Procedure was added in 2015.

the class,³⁰ (3) the score they received on the given essay (or performance task), (4) the score they received on an unrelated essay, (5) their score/percentile on the MBE subtest (if available) and (6) their score/percentile on an unrelated subtest. To maximize the opportunity to uncover relationships between *recent* classroom performance and subsequent performance on the CBX, only students who graduated within three years of their matriculation date and took the examination for the first time were included in the analyses.

We conducted a correlational analysis of these scores separately in each of the subject matter areas. Students' overall adjusted GPA and performances on the CBX scale scores were included as well to determine whether some course experience/performance impacted overall CBX performance more than others. The *differences* in the respective correlations were tested to determine if they were statistically different from zero ($\alpha=.01$). Results of the analyses are presented in Table III.15.

Table III.15 presents the Pearson correlation coefficients between the course grades and CBX performance.³¹ Each row in the table represents the relationship of the students' course grade to a different CBX metric. For example, the first row of the table shows that adjusted course grades in Civil Procedure classes correlated .34 with the CBX essay question covering Civil Procedure issues, while correlating .31 with an unrelated CBX essay question from that same administration. Those same grades correlated .39 with the MBE subtest questions covering Civil Procedure, while correlating .40 with an unrelated MBE subtest from the same administration. Since the number of students sitting for each of the classes varied, so did the samples on which the correlations were calculated. Sample sizes ranged from 1,247 in courses on Remedies, to 2,059 in Constitutional Law, a class taken by almost all students.

Overall, course performance was found to be moderately and positively related to performance on the written CBX questions covering the same content ($p<.001$); this was the case whether the CBX content appeared on an essay question or a Performance Task question. Correlations with MBE subtest performance was higher in all cases, most likely a function of the increased reliability of the MBE subtest scores. However, statistical tests indicated that *none of those correlations were significantly different than the correlation between the course grades and CBX performance on an unrelated topic*. For example, the .34 correlation between course grades and the Civil Procedure CBX essay was not statistically distinguishable from the .31 correlation between the course grades and the score earned on the unrelated essay ($p=.272$). Similarly, the .39 correlation between Civil Procedure grades and the Civil Procedure MBE subtest was only .01 different than the correlation between the course grade and an unrelated MBE subtest

³⁰ The same procedures used to adjust overall FYGPA and LSGPA was applied to the individual course grades to account for differences in school gradings scales (see Appendix 8).

³¹ In no course area was the number of units taken by students related to CBX performance. This finding was the same when all students were included in the analysis sample (even those who did not take the course) and when only students taking the class were included in the analysis sample. We believe this null finding is due to the lack of variation in the number of units earned in these courses between students. Thus, we report only the course GPA/CBX outcome correlations.

($p=.593$). This finding was consistent whether CBX performance was measured via essay, performance task, or MBE.

Thus, we conclude that performance in any given course is not uniquely related to performance on the CBX, and the relationships that were observed are most likely a function of the students' general legal knowledge.

Table III.15

***Correlations of Adjusted Law School Course-Specific Grades
with CBX Written Essay/Performance Task and MBE Subtest Scores***

<u>Course</u>	<u>Same CBX Written Content</u>	<u>Different CBX Written Content</u>	<u>Same CBX MBE Content</u>	<u>Different CBX MBE Content</u>
	<u>Essays</u>			
Civil Procedure	0.34	0.31	0.39	0.40
Community Property	0.30	0.26	N/A	N/A
Con Law	0.29	0.27	0.41	0.36
Contracts	0.23	0.22	0.42	0.42
Evidence	0.28	0.32	0.42	0.42
Prof. Responsibility	0.15	0.17	N/A	N/A
Property	0.26	0.29	N/A	N/A
Remedies	0.22	0.23	N/A	N/A
Torts	0.28	0.22	0.37	0.33
Wills & Trusts	0.28	0.25	.	.
	<u>Performance Tasks</u>			
Business	0.15	0.19	N/A	N/A
Criminal Law	0.18	N/A	0.34	0.36
Evidence	0.21	0.17	0.42	0.42
Property	0.31	0.27	N/A	N/A
Remedies (w. PT)	0.16	0.16	N/A	N/A

N/A=No alternative task or CBX score for this content area.

Note: Not all students took all classes, thus, each course correlation in the table is based on different samples.

This analysis focused on the impact of law schools' *individual* course performance on *specific* content areas of the CBX. While we saw no unique relationship on a course-by-course basis, it is possible that students' *cumulative* performance in these law school courses may have had a different effect. The aggregated GPA associated with multiple courses represented a more

reliable indicator of knowledge in those instructional areas than a single course, and the overall CBX scores were more reliable measures of the content areas covered in the examination than any one essay by itself.

We examined this possibility by creating two additional law school GPAs for each student. We calculated the first by obtaining a weighted GPA for all the courses covering the 13 bar related content areas (“Bar-Related GPA”). Since we did not have all of the students’ individual course grades, we estimated a “Non-Bar-Related GPA” for the students by algebraically removing the Bar-Related GPA from the students LSGPA.³² We then correlated both measures with the WRTSCL, MBESCL, and TOTSCL from the CBX. Again, we used only first-time examination takers who graduated within three years of their matriculation. Table III.16 presents the correlations between the various law school GPAs and the CBX.

Table III.16

Correlations of CBX Scale Scores with Student Actual GPA in CBX-Related Courses and Estimated GPA in Non-CBX-Related Courses

<u>CBX Scale Score</u>	<u>Law School GPA (N=5,367)</u>		
	<u>CBX-Related Courses</u>	<u>Non CBX-Related Courses</u>	<u>Final</u>
<i>Written</i>	0.58	0.52	0.57
<i>MBE</i>	0.68	0.57	0.64
<i>Total</i>	0.69	0.60	0.66

The size of the differences in the respective “related” versus “non-related” correlations are clearly larger than in the previous table, and the size of those differences were found to be statistically significant ($p < .0000$).³³ The almost .10 difference in the correlation with the TOTSCL was most likely driven by the MBE difference of .10. To illustrate this effect, we divided the calculated GPAs in both the CBX-related courses and the Non-CBX related courses into the same quintile ranges used in the previous analyses. We then determined the percentage of students who passed the examinations within the respective score ranges. The results are presented in Table III.17.

³² We assumed a total of 88 units per student based on the requirements for graduation at the majority of law schools.

³³ The p-values would be influenced by the larger sample sizes that the tests in Table III.13 were based upon.

Table III.17

***CBX Passage Rates Based on Law School Performance in
CBX-Related Courses vs. Non-CBX-Related Courses***

<u>GPA Range</u>	% Passing CBX	
	<u>CBX-Related Courses</u>	<u>Non CBX- Related Courses</u>
< 2.80	20%	30%
2.80-3.03	46%	54%
3.04-3.27	77%	65%
3.28-3.51	93%	78%
>3.51	99%	93%

Inspection of Table III.17 shows that for the same GPA, a student's probability of passing the CBX tended to increase more rapidly if he/she earned that GPA in courses with CBX-related content than in other courses. For example, a student earning a GPA between 3.28 and 3.51 in CBX-related courses had a 93% chance of passing the CBX as compared to 78% chance of passing if that student earned that GPA in non-CBX-related courses. Since the non-CBX related course GPA is an estimation, this finding would need to be confirmed using a complete set of students' individual course grades.

Impact of Other Curricular Offerings on CBX Performance.

The SAG suggested that five other curricular areas be studied. These included (1) bar preparation courses offered by the school, (2) specialty courses in subject areas not covered on the CBX, (3) clinical course work, (4) externships, and (5) professional internships. Schools were asked to provide the number of units that a student earned in each area. Participation in this aspect of the data collection was optional. Two of the eleven schools provided no data, and anywhere from four to eight schools provided the data on each of the curricular areas.

For each of the curricular areas, we examined the relationship with CBX performance from three perspectives: (1) the relationship of the absolute number of units taken with CBX TOTSCS across all students, (2) the relationship of those units, after considering the students overall GPA, and (3) whether participation in these courses by students at differing ability levels (as determined by their GPA), improved performance on the CBX. The analyses were conducted across all the schools that participated, as well as individually by school.

Bar Preparation Courses. Five law schools provided data for this variable. Students averaged about 1.5 units (range 0 to 6). For all those students, there was a $-.20$ ($p < .0001$) correlation between the number of units taken and CBX TOTSCl. The source of this negative relationship appears to be the fact that in five out of six of the schools, it was students with lower GPAs who took these classes. *After controlling for GPA, the number of bar preparation course units a student takes had no relationship to their performance on the CBX.* A follow up analysis, examining just the students in the lower half of GPA distribution, showed that there was no statistically significant difference in CBX TOTSCl for those who took a bar preparation course versus those who did not ($p = .24$). Analyses conducted within each of the five schools yielded similar findings.

Clinical Courses. Eight law schools provided data on clinical course units. Across those schools, students averaged about two units (range of 0 to 19) of clinical coursework, and about 35% of students had at least one unit. There was no relationship found between those students who took these courses and LSGPA (either across all of the schools, or at any of the eight schools individually), suggesting that the clinical courses were open to all students. *Both before and after controlling for LSGPA, the number of units was found to have no relationship with CBX performance when examined across all schools ($r = -.03$) and when evaluated at each law school separately (r 's ranging from $-.12$ to $+.03$).* The follow up analysis, examining just the students in the lower half of the GPA distribution, also showed that there was no statistically significant difference in CBX TOTSCl for those who took any clinical Course versus those who did not (1,402 vs. 1,397, respectively; $p = .16$). Analyses conducted within each of the eight schools yielded non-significant results as well.

Externships. Eight law schools also indicated that they had externships and provided the number of units earned by their students in these programs. Across those schools, on average, students earned slightly more than one unit (range of 0 to 27), with the averages ranging between one and two units for each school. In half of those schools, a statistically significant larger proportion of the students with higher GPA took those courses, while in the other half of schools there was no difference in their GPAs. This would suggest that the policies for who could take (or which students opted to take) externships was not consistent across the schools. There was a weak, but positive relationship between the number of externship units earned and CBX TOTSCl ($r = .22$; $p < .0001$). However, after controlling for students' GPA in a regression model, the externship/TOTSCl relationship dissipated, suggesting that the original $.22$ correlation was confounded with the broader law school performance levels of those who did and did not take the course. We conclude that overall, *the number of externship units had no independent relationship with CBX performance.* We draw a similar set of conclusions from analyses conducted within each of the eight schools.

Internships. Six law schools indicated that they offered units for internships and provided the data for their students. On average, students earned roughly three units (range of 0 to 25) for their internships, with the averages ranging between two and four units at each school. In none

of the six schools was there a difference in the GPAs of students who did or did not participate in an internship, suggesting that this program was open to all students. However, across all students, there was no statistically significant relationship between internship units and CBX TOTSCL ($r=-.02$; $p=.15$). Similarly, within each school, the correlations were also quite low and statistically non-significant, ranging from $-.05$ to $.12$. Based on this evidence, we conclude that overall, *the number of internship units had no independent relationship with CBX performance.*³⁴

Non-Bar Related Specialty Course Units. Only four schools reported on this variable. There was wide variation in the number of units reported, so analysis was done by individual school. For three of the schools, the average number of units taken were 28, 52, and 44, respectively. At the fourth school, the average was five, which we suspect was the number of courses as opposed to the number of units. In all schools, the number of units (courses) taken was highly correlated with overall GPA, suggesting that it was the better performing students in their 2L and 3L years that tended to take these classes. Correlations with CBX TOTSCL ranged from $.00$ to $.15$. As seen with other course areas, once overall GPA was factored in, all correlations approached 0, and the number of *non-bar related specialty course units had no statistically significant relationship with CBX performance.*

In summary it appears that neither coursework alone nor experience in any of these specialized areas provided any enhancement in performance on the CBX. It is possible that had actual grades in these additional courses been available, then the relationship possible would have been stronger. However, at this point we conclude that course and/or program exposure in any of the five specialized areas had little to no effect on students' performance on the CBX.

³⁴ Results from a single school showed a statistically significant 46-point improvement in CBX TOTSCL ($p<.02$) for students who took an internship over those who did not. The result was limited to the 70 students scoring in the bottom third of the class GPA distribution.

IV. SUMMARY & DISCUSSION

This study was the fourth and final in a series of investigations commissioned by the California State Bar to investigate potential causes of the recent decreases in performance on the California Bar Examination. The project entailed quantitative analyses of previously unavailable data on bar examinees in order to address two questions:

- 1) Were there stable statistical relationships between examinees' performance on the bar and their antecedent characteristics, credentials and law school experiences over time; and
- 2) Had the characteristics, credentials and law school experiences of those sitting for the CBX changed over time and, if so, to what extent did these changes explain the decline in bar passage rates.

The study was a collaborative effort between the State Bar of California and 11 ABA approved California law schools that participated in the project on a voluntary basis. No non-ABA approved schools elected to join the research. A Study Advisory Group (SAG) made up of law school deans, staff members from the State Bar and the study consultant guided the study design and assisted in its implementation.

The centerpiece of the study was an integrated database of 7,563 examinees which contained individual level demographic data and exam results for test-takers from the July 2013 (the baseline year), July 2016, and July 2017 administrations of the CBX, along with data on the entering law school credentials, law school experiences, and law school performance of these examinees provided by the law schools they had attended. The study sample constituted 46% of all CBX examinees, and 57% of all test-takers from ABA approved schools, for the three cycles of test administration examined. Initial comparative analyses of demographic and CBX performance data for the study sample with the total population of examinees indicated that the study findings could be generalized to test-takers from ABA-approved schools, but not to the total population of examinees which also included graduates of California accredited and unaccredited law schools.

Major Findings:

Major findings emerging from each of the sequential phases of the study analyses are presented below:

Changes in CBX Performance Between 2013, 2016 and 2017

By 2013, overall CBX passage rates were already in a state of steady decline, having fallen by 6% from 2008 (from 62% to 56%). In terms of subsequent decreases from 2013 to the latter two years in our sample:

- *There continued to be a fairly significant decrease in overall performance between 2013 and 2016, as evidenced by the 48-point drop in Total Scale Scores which resulted in a 16% drop in CBX passing rates. The Total Scale Score change represented a drop of more than a third of standard deviation (Stddif).*
- *Decreases between the 2013 and 2016 administrations were much more pronounced in first-time test-takers (-.35 Stddif) than those repeating the CBX (-.14 Stddif).*
- *CBX Total Scale Scores and passing rates increased slightly in 2017, yet were still lower than the 2013 levels by 33 points (-.25 Stddif) and 9%, respectively. Examinees repeating the CBX in 2017 actually performed better (Mean=1,404) than repeaters on the 2013 administration (Mean=1,396).*
- *Similar patterns were observed on the individual CBX sections (i.e., MBE and Written) scores*

Changes in Examinee Characteristics Over Time

The characteristics and credentials of the students sitting for these administrations were categorized into four categories: (1) demographics, (2) entering law school credentials, (3) law school “experiences,” and (4) law school performance, and were evaluated with an eye toward determining whether there were meaningful changes over time.

- *Statistically significant shifts ($p < .001$) occurred in the basic demographics of test-takers over administrations. The average age of examinees rose slightly from the 2013 to 2017 administrations (28.9 to 29.3). Over the same period, both the percentage of female test-takers (48% to 54%) and the percentage of minority test-takers (39% to 45%) increased.*
- *Statistically significant shifts ($p < .001$) also occurred in the examinees’ entering law school credentials. The mean UGPAs decreased steadily from 2013 to 2017 (3.40 to 3.35), while the proportion of students coming from the social sciences increased (47% to 52%). A more significant shift was observed in the LSAT where mean scores decreased from 159.4 in 2013 to 157.3 and 157.1 in 2016 and 2017, respectively. These decreases represented a Stddif of -.34 between 2013 and 2016, and a Stddif of -.37 between 2013 and 2017. Interestingly, a larger Stddif of -.50 was observed in the bottom quartile of the LSAT distribution.*

- *We found no statistically significant ($\alpha=.05$) overall shifts between years on any of the measures that we categorized as “law school experiences,” including the percentages of (a) part-time students (range of 11% to 12%), (b) transfer students (range of 6.3% to 8.0%), (c) attendance in the regular day program (range of 84.1% to 86.9%) or (d) students graduating within three years of matriculation/transfer into law school (range of 98% to 99%).*
- *Analysis of both unadjusted (i.e., original metric) and adjusted (i.e., using LSAT scores to standardize differences in grading scales) revealed no statistically significant differences between years in either the average FYGPA ($p=.439$) or LSGPA ($p=.335$). Additional analysis revealed that for each of the CBX administrations, the GPA distributions for the students were nearly identical, sharing common medians, means, quartile points, and score spreads. Separate analyses within each school yielded similar results. We suspect these findings reflect the policy of “grading on the curve”.*

Law Schools’ Bar-Related Curricular Changes.

- *Based on the institutional level data also provided by the participating law schools, we found that a given school’s curricular practices relating to the bar examination did not vary over the time period covering the three CBX administrations; however, there were sufficient differences between the schools warranting consideration in the subsequent analyses and model development.*

The Relationship of the Antecedent Characteristics and Credentials to CBX Performance

As an intermediate step in determining whether examinees’ attributes could help to explain the drop in CBX performance, analyses were conducted to assess the magnitude and stability (over CBX administrations) of the relationships between examinees’ characteristics and their performance with CBX scores and bar passage rates.

- *Correlational and regression analysis revealed that all but three of the measures had a statistically significant relationship ($p<.01$) with examinees’ MBE, Written and Total Scale Scores, and eventual P/F status. The three non-significant antecedent/CBX relationships were observed in variables from the “School Experience” category.*
- *Consistent with previous research, we found that among all variables, LSGPA demonstrated the strongest relationship with CBX Scale Scores (r ’s ranging from .662 to .687), followed by FYGPA (r ’s ranging from .595 to .609), LSAT (r ’s ranging from .368 to .428), and UGPA (r ’s ranging from .255 to .300).*
- *Smaller, yet still statistically significant relationships were observed between each of the demographic characteristics (i.e., age, gender, and ethnicity) and CBX outcomes during each administration.*

- *For the most part, the pattern of relationships between the antecedent characteristics was consistent for both MBE and Written Scale Scores, though the size of the relationships were generally lower than with Total Scale Scores. A notable exception was the difference in the direction of the relationship that gender had on the respective test sections*
- *Multivariate testing revealed that with a few marginal exceptions, the relationships between all test-takers antecedent characteristics and CBX outcomes remained stable across the three administrations. This would suggest that some portion of the decreases in both CBX scale scores and bar passage could be attributable to changes that occurred in the composition of each of the CBX cohorts over time.*

The Joint Impact of Antecedent Characteristics on CBX performance

Evaluation of the simultaneous impact of the antecedent student characteristics on CBX performance was conducted via Analysis of Covariance (ANCOVA) and Logistic Regression (for the CBX pass vs. fail outcome). The modeling was designed to determine the statistically significant set of predictors for each CBX outcome and then to evaluate their overall impact in terms of the percentage of variation in the outcomes that could be accounted for.

Specific results from the modeling revealed:

- *Antecedent measures from all categories, except the “Law School Experience” category, had a statistically significant joint relationship with one or more CBX metrics.*
- *Of the antecedent performance measures, LSGPA was the single most important predictor of CBX performance (due to its exceedingly high correlation with LSGPA, FYGPA added no statistically significant value and was excluded in the final models), followed by LSAT. UGPA had a small, but statistically significant effect on Total Scale Scores only.*
- *Examinee age, gender and minority status had small, but statistically significant, impacts that varied by CBX test section. For example, being a minority had a slight negative effect on MBE Scale Scores, but not on Written Scale Scores, resulting in an even smaller net impact (about 8 scale points) on Total Scale Scores and no subsequent impact on final P/F status.*
- *The overall impact of the models was evaluated in terms of the multivariate correlations (R) between the final “predictor set” and the CBX outcomes, and the percentage of variation in those outcomes that could be accounted for by the set (R^2). The resulting values were $R=.70$ ($R^2=50\%$) for the MBE Scale Score model; $R=.66$ ($R^2=44\%$) for the Written Scale Score, $R=.73$ ($R^2=54\%$) for the Total Scale Score, and $R=.57$ ($R^2=33\%$) for the final P/F status model.*

The Impact of Antecedent Characteristics on Declines in CBX performance

The preceding analyses indicated that the examinees taking the CBX during each of the three administrations differed on many characteristics found to be related to CBX performance. To control for these differences, ANCOVA (and logistic regression) models were applied as an adjustment mechanism to account for both the established relationships and any differences in the composition of the test-taking pool during the three CBX administrations. The analyses revealed that after factoring in significant antecedent student factors, differences in adjusted (i.e. “predicted”) CBX scores between 2013 and the latter administrations were statistically smaller than the actual differences that had been previously reported.

- *The size of the Total Scale Score differences between 2013 and the latter years was reduced by 20% and 39% for 2016 and 2017, respectively; for Written Scale Scores, the differences were reduced by 15% and 30%, respectively, and for MBE Scale Scores, the differences were reduced by 34% and 44%, respectively.*
- *The difference in the adjusted bar passage rates between 2013 and 2016 was 13.4% as compared to an actual difference of 17.2%, a relative 22% impact. The effect was larger for the 2013 to 2017 comparison where the difference in the adjusted bar passage rates between the two administrations was 4.9% as compared to an actual difference of 9.9%, a relative 51% impact.*
- *While the models indicated that a major portion of the decline in CBX performance could be explained by antecedent characteristics and credentials, a significant portion remained unexplained. The analyses showed that the differences between performance on the 2013 administration and performance in the latter two years remained statistically significant ($P < .001$) for all CBX measures, even after application of the statistical controls. These findings suggest that factors other than the ones considered in this study most likely have also played a role in the CBX performance decline.*
- *Isolating the differential impact of students’ pre-admission characteristics and credentials from subsequent antecedent factors on the decline in CBX scores was complicated by both statistical and logical issues. Despite these complications, an alternative set of models were developed suggesting that (1) approximately equal parts of the percentage impact could be attributed to the pre and post admission variable sets, and (2) the findings were roughly the same for each of the CBX scale scores and bar passage rate.*

The Impact of Law School Coursework on CBX performance

A question of special interest to law school deans and faculty was whether exposure to, and performance in, specific law school courses related to the legal subject areas covered on the CBX, or in specialized courses such as bar preparation, clinical courses or intern/externships,

would lead to improved performance on the CBX. Reporting the number of units and/or grades for these courses was optional for the participating schools. Depending on the specific course, between four and eleven schools provided data. The following findings are therefore limited to the unique set of schools reporting in each area.

- *Correlational analysis revealed that performance (or attendance) in a given law school course covering any of the 13 bar related topics was not uniquely related to performance on a CBX question or MBE subtest covering the same content.*
- *However, overall CBX performance correlated more strongly statistically ($p < .001$) with aggregate performance in all of the bar-related courses than with aggregate performance in all non-bar-related courses, suggesting that there may be some type of cumulative effect operating.*
- *We could find no evidence that participation in any of the other specialized course areas of interest (e.g., Bar preparation courses, Externships) had any statistically significant impact on CBX performance, either before or after adjustments for overall law school performance, or for particular subgroups of students, such as those with lower GPAs.*

Discussion

That fact that bar examination scores have been in steady decline for the last nine years, both nation-wide and within California, is indisputable. What has been the focus of debate are the causes for this decline. The hypotheses that have been generated are varied, sometimes colored by the perspective and biases of a particular stakeholder, and frequently at odds. Suffice it to say, there are a multitude of complex and interrelated social, behavioral, and economic factors involved, all most likely playing some direct or indirect role.

The value of recent research relative to the debate regarding the decline in bar performance has been limited by two significant factors. The first is the lack of individual-level data for test-takers, and the subsequent reliance on published, aggregated law school-level information (e.g., see Albanese, 2015, 2016 and 2018). As researchers readily admit, use of aggregate data to make inferences about individuals has inherent shortcomings. Furthermore, almost all available law school-level information has been gathered on the matriculating class as opposed to the graduating class that sits for the bar examination. Attempts to correct for this shortcoming rely yet again on inferences from aggregated academic dismissal and voluntary transfer rates.

A second limitation emanates from the lack of broad, multi-variable databases, resulting in investigations that focus on the one-to-one relationship of a single credential (e.g., average or lowest quartile point of the group LSAT distributions) to a single bar examination performance metric (e.g., bar passage rates). Subsequently, these studies fail to consider other potential

confounding factors (e.g., group demographics) that might lead to alternative inferences and are not able to focus on the more granular underlying score distributions on which a pass/fail decision is made.

In entering this research, we did not believe that the investigation would provide the definitive answer to why bar examination scores have been in decline. We aimed instead to bring additional empirical evidence to bear through a study that advanced beyond the recognized limitations of prior studies.

The results of this study are valuable for many reasons. First and foremost, they helped to establish a clear link between several antecedent (i.e., pre-bar) attributes of test-takers and their performance on the CBX, and to disentangle the relative strength of those linkages. Through correlational methods, we were able to quantify the size and directionality of relationships between multiple antecedent examinee attributes, and to show that even during this period of change and decline in CBX performance, most of the relationships remained stable. These outcomes lend supporting evidence to the hypothesis that at least some aspect of the recent changes in CBX performance are clearly related to shifts in the attributes of examinees over the past decade.

We were also able to look past simple one-to-one relationships. We were able to evaluate the simultaneous impact of multiple variables that exhibited varying degrees of collinearity. For example, these findings serve as a reminder of the dangers of drawing interpretations of the impact of racial/ethnic status on CBX performance. Consistent with the 1997 findings of Klein and Bolus, this study reconfirmed that racial/ethnic minorities *with equivalent credentials* to whites will tend to earn the same scores on the CBX and have the same probability of passing. The outcome of our analysis also helped to clarify the net impact of LSAT and Undergraduate GPA. We demonstrated that while these pre-admission credentials are clearly predictors of CBX performance, their impact is greatly attenuated when considered in conjunction with an examinee's experience and performance in law school.

Through the application of the statistical models, we were also able to demonstrate that portions of the decline in CBX scores during the study time frame could be explained by changes in the composition of the populations of examinees over the three years. By social science standards, the predictive power of the models was reasonably strong, accounting for over 50% of the variability in CBX Total Scale Scores and well in-line with findings of past efforts in this area (e.g., Kane et al. 2006). We believe that the study proves that identifiable, systematic, and measurable changes in the demographic characteristics and antecedent credentials of examinees explain some portion of the decline in bar scores and passage rates. As such, any discussion of potential causes of the decline in scores and passage rates must extend beyond the relevance and validity of the CBX alone. We also feel that these results serve as a solid reference point for further investigation.

Having said this, we readily acknowledge that the explanatory power of the study's analytical models was far from perfect, and much of the CBX performance variation between test-takers and between administrations remains unaccounted for. Generally, unexplained variation in any type of statistical modeling comes from one or more of three sources of error including random differences, measurement error or specification error. The latter two types are of specific relevance to this study, as detailed below.

GPA as a potential source of measurement error. Measurement error generally refers to the difference between the true underlying value of a trait or construct and its measured value. This difference is an inherent part of the measurement process and recording values. The greater the measurement error, the larger its effect on reducing the strength of relationships.

In the current study, LSGPA clearly had the strongest relationship with performance on the CBX, and explained a good portion of the variability in the CBX scale scores and passage rates. However, its real impact in explaining differences in CBX performance *between administrations* may be attenuated by policies of “grading on the curve” at the law schools.

Statistical analyses revealed that at each of the participating schools, there were no significant differences between class years on the original GPA scales (either FYPGA or LSGPA; $\alpha=.05$) used at the law schools. The GPA spreads were also markedly similar from year to year. Analyses used in this report relied on GPAs that were statistically adjusted (through use of the LSAT) to first and foremost control for differences in grading scales used at each of the schools, but also to help adjust for between-year similarities/differences. A subsequent analysis of those “Adjusted” GPA scores at each of the schools also indicated no between-year differences ($\alpha=.05$).

We suspect that while the .44 correlation between LSAT and LSGPA did a reasonable job in helping to standardize, or normalize, the differences in grading scales between schools, it may not have adequately controlled for the between year differences in the underlying level of classroom performance *within schools over time, if they existed*. There was insufficient data available to prove this. However, if true, we suspect that the adjusted CBX scores and passing rates between the three administrations may have been even closer.

Reliability of CBX essay question, MBE subtest scores and course grades. The reliability of these measures represents another source of measurement error in our analysis. Our two-stage correlation analysis suggested that better performance in individual bar-related courses did not translate into improved performance on CBX essay questions and/or MBE subtests in those same topic areas. Yet, in the second stage of the analysis we found some seemingly contradictory evidence suggesting that aggregate performance across all courses may have led to better performance on the overall CBX. In the first stage of the analysis, we necessarily relied on a single grade in a single course and a single CBX essay (or MBE subtest) to evaluate the one-to-one relationship. It may truly be the case that it is more general legal reasoning and analytic

skills, and not specific content area knowledge, that leads to better CBX performance. It is also possible, however, that the true underlying relationship between content instruction to CBX content performance was masked due to the unreliability (increased measurement error) of a single essay question, or a grade in one doctrinal course. While these results shed new light on this question, more research is needed.

Specification error and directions for additional research. Specification error refers to the exclusion of critical explanatory variables during modeling. Almost all modeling exercises of the types conducted in this study will exhibit some form of specification error. For both budgetary and scheduling reasons, the scope of this study was limited to data available within the law schools' and the California Bar's databases. Using only the attributes and credentials of test-takers that were available within those databases, we were able to cost-effectively explain some of the reasons for the decrease in CBX performance. While we believe that the results clearly improve upon past research, we also openly acknowledge that there are many other potential measurable factors that could be included to reduce the specification error of models and subsequently help to further explain the decline in CBX performance.

Several categories of variables were not available for this study that also *may* have an impact on changes in CBX performance. There are some in the legal community have argued that recently matriculated students differ in both tangible and intangible ways from their predecessors. They posit that students are coming into law school with different learning skills which are not directly measurable by an LSAT score. Once in law school, others believe that students learning styles have changed as has the amount of time spent on coursework outside of class (due to differences in motivation or an increasing need for gainful employment outside of school to mitigate debt issues and family demands³⁵). Still others have argued that because of these and other issues, students' level of engagement in the overall law school experience may have been altered over time. And, once they are ready to sit for the bar examination, their methods of preparation have changed.

Many of these are factors are simply working hypotheses, while some are backed by past research linking them to performance on bar examinations. For example, in 2004, Klein and Bolus reported in a study of the Texas Bar Examination that applicants who worked while preparing for the bar examination earned about 15 total scale score points less than their classmates with comparable LSAT scores and LSGPA who were not working; a difference comparable to the unique effect of being a first-time test taker in that state. They also found that applicants could earn up to an additional 10 scale score points based on the methods that they used to prepare for the exam. There is also new research exploring other linkages between other potential factors and bar examination scores. A collaborative effort between the Law School Survey of Student Engagement (LSSSE) and AccessLex Institute is now underway, attempting

³⁵ In the ABA Standards for Approval of Law Schools, Standard 304(f), which restricted student employment to 20 hours per week, was eliminated in 2014.

to understand the potential for using student engagement theory to understand the process and actions that contribute to bar examination performance. Both past and present research may point to fruitful new avenues of investigation for California.

Given the collaborations between the State Bar and the California law schools formed through this study, the opportunity now exists to systematically capture new data on these additional metrics through an ongoing survey program of stakeholders. Using self-report information from law school students, law school faculty and deans, and possibly practicing lawyers, the models developed in this study could be expanded. Data from these sources could subsequently be applied to reduce the specification error in this research, help to quantify the impact of many of these hypothesized factors, and be used on an ongoing basis to determine their role in the shifting performance on the CBX.

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APPENDICES

Appendix 1

List of Study Advisory Group Members

<u>Name</u>	<u>Affiliation</u>
Martin Pritikin	Concord Law School, Dean
David Faigman	University of California Hastings College of Law, Dean
Jay Mootz	University of the Pacific McGeorge School of Law, Dean
Mitchel Winick	Monterey College of Law, Dean
Susan Prager	Southwestern Law School, Dean
Natalie Rodriguez	Southwestern Law School, Assistant Dean
Ron Pi	California State Bar, Project Coordinator
Roger Bolus, Ph.D.	Research Solutions Group, Principal Investigator

Appendix 2

List of Study Data Elements by Data Source

1. Primary Variables from Law Schools			
#	<u>Variable Name</u>	<u>Data Type/Format</u>	<u>Notes</u>
<u>Student Level</u>			
1	Matriculating Year	Numeric	
2	Transfer In status (Y/N)	Y/N	
3	Graduation Year	Numeric	
4	Undergraduate GPA	Numeric	
5	Highest LSAT score	Numeric	
	Average LSAT score	Numeric	
7	First Year Law School Grade Point Average	Numeric	GPA at the end of first year regardless of school type or part time/full time
8	Final Law School Cumulative Grade Point Average	Numeric	Defined based on status at time of enrollment
9	Part Time/Full Time	P/F	
<u>Institutional Level</u>			
For matriculating class of 2005, 2013 and 2014 (2004, 2012 and 2013 for evening part-time students)			
1	Number of students matriculating in the class	Numeric	
2	Number of students graduating in 2008, 2016, and 2017	Numeric	
3	Grading scale used for matriculating class	Numeric	Grade range (e.g., 0 - 100; A - F; 60 - 85; 0.0 - 4.0)
4	Number of students who transferred out from the entering class	Numeric	
5	Number of students academically dismissed from the entering class	Numeric	
6	Number of students who did not complete their degree for any other reason from the entering class	Numeric	
1. Primary Student Level from the State Bar database merged with individual students			
1	Number of exam attempts		
2	Gender		

3	Race/ethnicity		
4	Age at time of examination		
5	Scores on individual essay questions		Scores mapped to each of 13 CBX legal content areas
6	Scores on individual performance tasks		
7	Scaled Total Written Score		
8	MBE Scale Score		
9	MBE percentile scores on each of 7 subtest areas		Available for 2017 exam only
10	Scaled Total Score		Based on 35/65 weighting for 2013 and 2016, and 50/50 weighting in 2017

2. Secondary Variables from Law Schools (if Available)

Student Level

1	Regular Day Program vs. Another Program	D/O	Defined as "Other Program" if a student was in the "other" program for any period during law school
2	Undergraduate major		Categories of fields of study yet to be define such as humanities, social science, natural science and engineer, etc.
3	Student had an area of concentration?	Y/N	
4	Bar course unit taken - Business Associations	Numeric	Schools would determine the courses that fit the description of the bar course subjects
5	Bar course unit taken - Civil Procedure	Numeric	Same as above
6	Bar course unit taken - Community Property	Numeric	Same as above
7	Bar course unit taken - Con Law	Numeric	Same as above
8	Bar course unit taken - Contracts	Numeric	Same as above
9	Bar course unit taken - Crim Procedure	Numeric	Same as above
10	Bar course unit taken - Crim Law	Numeric	Same as above
11	Bar course unit taken - Evidence	Numeric	Same as above
12	Bar course unit taken - Prof Responsibility	Numeric	Same as above
13	Bar course unit taken - Real Property	Numeric	Same as above
14	Bar course unit taken - Remedies	Numeric	Same as above
15	Bar course unit taken - Torts	Numeric	Same as above
16	Bar course unit taken - Trusts	Numeric	Same as above
17	Bar course unit taken - Wills	Numeric	Same as above
18	Bar course grade - Business Associations	Numeric	Same as above
19	Bar course grade - Civil Procedure	Numeric	Same as above
20	Bar course grade - Community Property	Numeric	Same as above
21	Bar course grade - Con Law	Numeric	Same as above
22	Bar course grade - Contracts	Numeric	Same as above
23	Bar course grade - Crim Procedure	Numeric	Same as above
24	Bar course grade - Crim Law	Numeric	Same as above
25	Bar course grade - Evidence	Numeric	Same as above
26	Bar course grade - Prof Responsibility	Numeric	Same as above
27	Bar course grade - Real Property	Numeric	Same as above
28	Bar course grade - Remedies	Numeric	Same as above
29	Bar course grade - Torts	Numeric	Same as above
30	Bar course grade - Trusts	Numeric	Same as above
31	Bar course grade - Wills	Numeric	Same as above
32	Bar prep course - units taken	Numeric	Refers to any courses taken for credit designed to prepare students for any of the three parts of the bar exam but not including doctrinal courses.

33	Number of non-bar specialty classes (e.g., Intellectual Property) taken	Numeric	
34	Clinical courses - units taken	Numeric	
35	Judicial externships - units taken	Numeric	
36	Professional internships - units taken	Numeric	
<u>Institutional Level</u>			
For each matriculating class			
1	Number of units devoted to first-year bar classes	Numeric	
2	Number of non-bar specialty classes (e.g., Intellectual Property) offered	Numeric	
3	Number of concentration area(s) offered	Numeric	
4	Number of faculty using open-book exams	Numeric	
5	Number of upper division bar-related classes offered	Numeric	
6	Semester, Quarter or some other system	S/Q/O	
7	Total units required for graduation	Numeric	

Appendix 3

Data Confidentiality, SB690 and FERPA.

A primary concern about the study voiced by all of the California deans was the protections and confidentiality of all study data. Because of a recent court case, the State Bar was prohibited from releasing any individual bar results directly to the law schools, as such a release was deemed to be subject to public disclosure. As a result, for the past several years, the state's law schools were not notified which of their students passed or failed the bar examination. The deans felt that this would be an impediment and disincentive for their colleagues to participate. Additionally, there were concerns voiced by public institutions that the Federal Education Rights and Privacy Act (FERPA) might not protect the release of students' information to the Bar. There were differing legal opinions regarding whether the purpose of the study met the standards under which FERPA could offer protection.

Along a parallel path, in February 2017, State Assembly Bill 690 (SB690) was introduced in the California Legislature. The bill was intended to provide confidentiality and data security protections to information provided by the bar to law schools and for student data collected from law schools that participated in the study. Between February 2017 and October 2017, the content of SB690 varied as it moved toward ratification and signature by the governor. The breadth and specificity of the bill changed several times over the nine-month period. During some of those iterations, the bill was modified in such a way as to negate the possibility of insuring confidentiality of the data exchange, thereby negating the possibility of conducting the study.

The core text of the bill that related to the study is as follows:

(a) Notwithstanding any other law, any identifying information submitted by an applicant to the State Bar for admission and a license to practice law and all State Bar admission records, including, but not limited to, bar examination scores, law school grade point average (GPA), undergraduate GPA, Law School Admission Test scores, race or ethnicity, and any information contained within the State Bar Admissions database or any file or other data created by the State Bar with information submitted by the applicant that may identify an individual applicant, other than information described in subdivision (b), shall be confidential and shall not be disclosed pursuant to any state law, including, but not limited to, the California Public Records Act (Chapter 3.5 (commencing with Section 6250) of Division 7 of Title 1 of the Government Code).

(b) Subject to existing state and federal laws protecting education records, subdivision (a) does not prohibit the disclosure of any of the following:

(1) The names of applicants who have passed any examination administered, given, or prescribed by the Committee of Bar Examiners.

(2) Information that is provided at the request of an applicant to another jurisdiction where the applicant is seeking admission to the practice of law.

(3) Information provided to a law school that is necessary for the purpose of the law school's compliance with accreditation or regulatory requirements. Beginning with the release of results from the July 2018 bar examination, the information provided to a law school shall also include the bar examination results of the law school's graduates allocated to the law school and the scores of any graduate allocated to the law school who did not pass the bar examination and who consents to the release of his or her scores to the law school. Consent of a law school graduate to the release of his or her scores may be obtained by a check-off on the graduate's application to take the bar examination. For purposes of this paragraph, "scores" means the same scores reported to a graduate who did not successfully pass the bar examination.

(4) Information provided to the National Conference of Bar Examiners or a successor nonprofit organization in connection to the State Bar's administration of any examination.

(5) This subdivision shall apply retroactively to January 1, 2016.

(c) Disclosure of any of the information in paragraphs (2) to (4), inclusive, of subdivision (b) shall not constitute a waiver under Section 6254.5 of the Government Code of the exemption from disclosure provided for in subdivision (a) of this section.

(d) (1) Notwithstanding any other law except existing state and federal laws protecting education records, any information received from an educational or testing entity that is collected by the State Bar for the purpose of conducting a Law School Bar Exam Performance Study as the State Bar has been directed to do by the California Supreme Court by letter dated February 28, 2017, other than aggregate, summary, or statistical data that does not identify any person and does not provide substantial risk of identification of any person, shall be confidential and shall not be disclosed pursuant to any state law, including, but not limited to, the California Public Records Act (Chapter 3.5 (commencing with Section 6250) of Division 7 of Title 1 of the Government Code).

(2) Nothing in this subdivision is intended to impact any litigation pending on the effective date of the measure that added this subdivision.

Participating schools felt that this verbiage offered sufficient protection to participate.

Appendix 4

Timeline of Study Activities and Relevant Events

December 2016	Initial concept and study design developed for the Senior Director of Admissions, California Bar.
January 2017	Proposal presented to the CBX for their consideration.
February 2017	Performance Changes Study completed by Dr. Roger Bolus and submitted to the California Bar Board of Trustees, with the study recommending the proposed work.
February 2017	SB 690 first introduced in the Legislature intended to provide confidentiality and data security protections for student data collected from law schools participating in the study
March 2017	The proposal to conduct study with law schools is approved and a liaison from the Bar is assigned to the project.
May 2017	The Bar completed creation and formation of Study Advisory Group (SAG) consisting of five law school deans, one representing CALS and Registered law schools, respectively, three representing ABA schools, a Bar staff member and the Principal Investigator.
June 2017	Advisory Group deans met to review and finalize the study design and discussed recruitment effort to invite law schools to participate in the study. Recommendations were made to allow all schools to participate and expand data collection and applicant sample.
July-August 2017	The Bar sends a survey to all California law schools to solicit participation in the study. Twenty-six law schools responded positively expressing interest in the study, including 13 ABA-Approved schools, 10 Accredited schools, and 3 Registered schools.
July-October 2017	Conference calls conducted between Bar's internal and external counsel, law school deans and their counsels to address issues of study data privacy and confidentiality.
October 2017	California Governor signs SB 690

October 2017	The Bar reached out to law schools requesting confirmation of earlier decisions regarding study participation. Six (6) law schools responded positively confirming earlier decision to participate in the study.
October 2017	As incentive to increase law schools' interest in study participation, the Bar responded to law schools' suggestion to modify the study design by changing the original exam cohorts of 2008 and 2016 to those of 2013, 2016, and 2017. Another offer to participate in the study is sent out to the California law school community.
November 2017	Eleven (11) ABA-approved schools indicate willingness to participate in the study. California Accredited schools and Unaccredited opt not to participate.
December 2017	Bar sends out initial lists of applicants from 2013, 2016 and 2017 to the participating schools along with templates describing primary and secondary data to be collected from the schools' records.
January 2017- May 2018	Schools collect the requested data, conferring with the Bar representative as questions arise. The Bar receives the data, reformats, links with CBX results and performs quality control checking. The final school submits data at the end of May.
June 2018	The Bar completes data cleaning activities and provides investigator with datasets containing final linked student and school level dataset

Appendix 5

Participating Law Schools

Golden Gate University School of Law

Loyola Law School-Los Angeles

Pepperdine University School of Law

Southwestern Law School

University of California, Davis School of Law

University of California, Hastings College of Law

University of California, Irvine School of Law

University of California, Los Angeles School of Law

University of San Diego School of Law

University of the Pacific McGeorge School of Law

Western State University College of Law

Appendix 6

Data Sharing and Confidentiality Agreement with Participating Law Schools

This is a Data Sharing and Confidentiality Agreement (“Agreement”) between The State Bar of California (“State Bar”), on behalf of its contractor, Roger Bolus, (“Principal Investigator” and collectively with “State Bar,” the “Recipient”) and [Law School Name] (“Law School”). For purposes of the Family Educational Rights and Privacy Act (“FERPA”), The State Bar is an organization conducting studies for, or on behalf of, Law School pursuant to 20 U.S.C. section 1232g(b)(1)(F) and 34 C.F.R section 99.31 (a)(6). This Agreement shall govern access to data and information maintained by the Law School, as specifically described below.

A. Purposes.

1. The purpose of this Confidentiality Agreement is for Law School to facilitate a study to improve legal education to better prepare law students to pass the State Bar admission examination and to provide the State Bar, a public corporation and judicial adjunct of the Supreme Court, data regarding the relationship between law school performance and bar exam passage to facilitate bar entry for qualified law students (“Study”).
2. Bar entry is a key goal of the Law School’s students and preparation for the bar examination is an important learning objective for the Law School and its students. Bar examination rates are steadily decreasing. The Study is part of an effort to better understand whether the declining passage rate reflects changes in the legal education environment and/or other factors impacting the ability of law students to enter the bar.
3. The Study will examine the preparation and ability level of the examinees sitting for the 2013, 2016 and 2017 July bar examinations; relationships between performance on the bar examination and applicant ability/preparation levels; and whether performance on the examinations is consistent over time for those subgroups with similar ability. The study findings will assist Law School in efforts to better prepare students for the bar examination. In addition, the Study will assist the State Bar to determine if any revisions should be recommended regarding the bar examination.

B. Term.

The term of this Agreement begins on December 15, 2017 or the date the Agreement is executed by both Parties, whichever is earlier. The term of this Agreement ends on June 30, 2018 or upon

completion of the Study whichever date is earlier; provided, however, that any obligations or duties that the State Bar has under this Agreement relating to the confidentiality of data, destruction of data, and liability related thereto shall survive termination or expiration of this Agreement. In the event the Recipient anticipates that the Study will not be completed by June 30, 2018, at least thirty (30) days prior to such date, Recipient shall notify Law School of (i) the anticipated date of completion and (ii) current status of the Study so that the Parties may negotiate an amendment to this Agreement to allow for Study completion.

C. Recipient's Confidentiality and Data Use Obligations.

1. Within 30 days following the date of the last signature on this Confidentiality Agreement, Law School shall make reasonable efforts to provide the data set forth in Exhibit A to State Bar.
2. The State Bar and Law School contact persons identified in this Confidentiality Agreement may mutually agree in writing to modifications to Exhibit A. In the case of a conflict between the terms of Exhibit A and this Agreement, the terms of this Agreement shall control.
3. Covered data and information ("CDI") includes any and all data provided by Law School to the Recipient pursuant to this Agreement, including any paper and electronic student education record information supplied by Law School.
4. All CDI provided to Recipient pursuant to this Confidentiality Agreement shall be kept strictly confidential as follows:
 - a. Recipient shall not use or disclose the confidential data received from or on behalf of Law School except as specifically authorized by the Agreement (as the Agreement may be amended from time to time) or as required by law. Recipient shall not use the confidential data for any purpose other than the purpose for which the disclosure was made, including for any other Study or effort other than the Study specifically described in section A of this Agreement.
 - b. Recipient shall conduct the Study in a manner that does not permit personal identification of students of Law School by individuals other than representatives of the State Bar and, in

the case of representatives of the State Bar, only to such persons who have a legitimate interest in the information and who are directly involved in the preparation, conduct and evaluation of the Study.

c. Authorized Users

(1) Recipient shall limit access to the CDI to the Principal Investigator and those individuals affiliated with and working within the State Bar under the supervision of Principal Investigator who are listed on Exhibit B to this Agreement and have also accepted the terms of this Agreement (each a “Project Investigator” and collectively with the Principal Investigator, “Authorized Users”). Recipient shall refer to the Law School any request for access to the CDI from anyone other than the Authorized Users.

(2) Recipient shall immediately notify the Law School if it becomes aware that any of the Authorized Users has failed to comply with the terms of this Agreement and/or has compromised the privacy and security of the CDI. In such event, Recipient shall comply with Section 4(d) of this Agreement and the Law School, at its sole option, may immediately remove such user from the list of Authorized Users and immediately terminate such user’s access to the CDI.

(3) Except as permitted by this section C (4), Recipient shall not directly or indirectly disclose, distribute, or otherwise allow any third party to have access to any of the CDI without such third party executing a data transfer and non-disclosure agreement with the Law School under the same terms, or terms at least as restrictive, as set forth in this Agreement. Any new principal or project investigator shall execute an amended Exhibit B, Project Investigators.

- d. The State Bar Contact Person shall notify the Law School Contact Person within 24 hours of becoming aware of any security incident that may or may have compromised the security, privacy or integrity of the CDI. The notification shall describe the incident in detail and identify responsible staff (name, title, and contact information).

5. All results of the Study presented by Recipient in publicly disclosable documents shall be at an aggregate level such that no individual or small group can be identified, either directly or through identifiers linked to the individuals. Prior to any reporting that includes Law School's CDI, Recipient will meet and confer with Law School on data disclosure avoidance methodologies to protect personally identifying information in the reporting of Law School's CDI.

D. Physical and Technical Safeguards.

1. Recipient shall develop, implement, maintain and use reasonable administrative, technical and physical security measures to preserve the security, privacy, integrity, and availability of all electronically maintained or transmitted CDI received from, or on behalf of, Law School, including encryption and role-based access controls for any electronic and network-accessible systems with access to the CDI.
2. Recipient shall notify Law School when the research utilizing the Law School confidential data provided under this Agreement has been completed. At the conclusion of the Study, the parties shall meet and confer to discuss the type of data that will be returned to the Law School. Within 30 days thereafter, Recipient shall destroy any and all CDI and shall provide Law School with a certificate confirming the date of and method of destruction of CDI.

E. No Warranties; Limitation of Liability.

1. THE DATA IS PROVIDED "AS IS" AND WITHOUT ANY WARRANTY EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR THAT THE USE OF THE DATA WILL NOT INFRINGE OR VIOLATE ANY PATENT, COPYRIGHT, TRADEMARK OR PROPRIETARY RIGHTS OF ANY THIRD PARTY.
2. In no event will the Law School be liable for any use or disclosure of the CDI by the State Bar, an Authorized User, State Bar's other employees, representatives, agents, and/or contractors, or for any claims, damages, losses, or liabilities, of whatsoever kind or nature, which may arise out of or in connection with the use or disclosure of the CDI by the State Bar, an Authorized User, or State Bar's other employees, representatives, agents, and/or contractors.

3. The State Bar agrees to defend, indemnify, and hold harmless the Law School and its trustees, officers, employees, faculty, agents or representatives from any loss, claim, damage, or liability of any kind or nature, which may arise from or in connection with this Agreement or from the State Bar's acceptance, use, storage or disposal of the CDI, except loss, claims, damages, or liabilities arising directly from the gross negligence or willful misconduct of the Law School. State Bar's indemnification obligations under the Agreement include the costs which arise as a result of Recipient's breach of this Agreement.

F. General Provisions.

1. The CDI shall be used by the State Bar only for the purposes specified in this Agreement.
2. The terms of this Agreement may be amended at any time by written mutual consent of all parties.
3. This Agreement constitutes the entire agreement between Law School and the Recipient. Any modification of this Agreement must be in writing and signed by all parties. Any oral representations or agreements between the parties shall be of no force or effect. The invalidity in whole or in part of any provisions of this Agreement shall not void or affect the validity of any other provisions of this Agreement.
4. Any disputes between the parties concerning the interpretation of this Agreement shall be resolved by the parties, or the agreement may be terminated.
5. Any party may terminate this Agreement upon thirty (30) days written notice to the other parties.
6. The State Bar contact person shall be:

Ron Pi, Principal Program Analyst, Office of Research and Institutional Accountability

The State Bar of California

180 Howard Street

San Francisco, CA 94105

415-538-2000

7. The Law School contact person shall be:

Appendix 7

Derived Variables and Adjusted Grade Point Averages

Several derived variables were created for purposes of the study analysis. Some original variables were “recoded” into more discrete categories to more easily visualize relationships. For example, undergraduate grade point averages that were on a 0.00 to 4.00 scale were recoded into 5 categories representing fixed percentages of the score distribution. In other instances, more discrete categories were aggregated into a commonly used single-category variable. A key example included creating a single dichotomous variable of “Minority vs. Non-Minority” out of the “Ethnicity/Race” data element, which consisted of ten or more categories. Similarly, the single dichotomous variable of “Repeater vs. First-Time Taker” was derived from a variable which indicated the number of previous examination attempts a student had at the time of the examination. The California Bar also undertook an extensive analysis of the various undergraduate majors to re-categorize them into the standard set used by the American Bar Association (when the participating schools did not use that system).

Procedures Used to Adjust Law School Grade Point Averages

GPA's obtained from the schools were recorded in the original metric in which they were obtained. Because schools use different grading scales and standards, it was necessary to adjust for those potential differences for statistical analysis purposes. Several methods have been used historically, but the common denominator in all have been to anchor the adjustment to a common standardized scale when available (e.g., SAT). The adjustment procedures applied by Wightman (1998) in the *Law School Admission Council National Longitudinal Bar Passage Study* were selected for the current study since there was commonality in many of the same issues facing both studies.

The adjustment process required several steps. First, law school grades were standardized separately within each law school to have a mean of 100 and standard deviation of 10. This step was required because not all law schools use the same grading scale. Standardization puts all schools on a common scale. A major issue with pooling the unadjusted/within school-school standardized grades for analysis is that differences between schools' grading practices are ignored. In other words, regardless of differences between schools, a standardized LGPA of 100 at school A would be indistinguishable from an LGPA of 100 at school B, despite differences in quality of student.

The second step in the adjustment process was to regress the standardized LGPA of all students on Law School Admission Test (LSAT) score (and UGPA when available) to obtain linear least squares regression weights to predict LGPA from the predictors. The weight(s) was(were) then applied to the predictor values of every student to obtain a *predicted* LGPA for the student. The

average of the predicted LGPAs was calculated separately for participating law school to obtain a within-school predicted mean.

In the next step, each school's predicted mean then was used to adjust the within-school standardized LGPA for every student in that school. For example, if the mean predicted LGPA (on the standardized 100/10 scale) for a particular school was 101 then 1 point was added to the standardized LGPA of every student in that school. If the mean predicted LGPA were 98 then 2 points was subtracted from the standardized LGPA of every student in that school. The adjustments were applied separately for each examination year in the study³⁶.

Finally, the scores were scaled back to one that more closely resembled the traditional 4.0 grading system by centering and spreading the first year and final GPA distributions around means of 3.00 and 3.15 and score spreads of .46 and .40, respectively. These were the approximate parameters for the entire sample of students on the original raw scores.

³⁶ We note that one limitation (and difference from the Wightman study) is that the current study did not deal with intact law school classes. Rather, the focus was on cohorts of students who sat for the CBX. Our analyses revealed, however, that at least 94% of test takers in any of the years under study were members of the same entering and graduating class for each law school. We reasoned that this represented a large enough cohort in each of the schools to proceed with this adjustment method.

Appendix 8

Procedures for Compilation and Preparation of Study Database

In mid-December 2017, the California Bar extracted the list of all test takers from each of the participating schools who sat for one or more of the examinations in any of the three years. It then prepared school-specific lists with student names and sent these lists to the schools along with the list of requested primary and secondary variables. Schools were provided with an MS Excel template to use to record the requested data but were allowed to use whatever format they found to be the easiest. Participating schools were given until the end of March 2018 to complete their collection and send their data file back to the California Bar. Because of delays, the submission of all school data was not completed until the end of May 2018.

Upon receipt of the individual data files from the schools, the California Bar cross-checked the file with the allocation lists originally sent to the schools to check for completeness.

Discrepancies were discussed with the school and resolved. The California Bar then proceeded to conduct a series of quality control checks on the files, including performing range checks on numerical variables (e.g., Grade Point Averages) and verifying true zero values to distinguish them from missing values. The California Bar also correlated key variables known to generally be related (e.g., LSAT and Final GPA) and performed visual inspection of scatterplots of to identify potential outlier cases. Suspected problems were discussed with the schools and corrected when necessary. The California Bar also resolved differences between the grading scales of the participating schools.

Using a cross-reference file of student name and unique identifying code, the California Bar then linked the individual data files from the law schools to data from its archives. For each student, his or date of birth, gender, and race/ethnicity were extracted from the California Bar's archives. For each administration of the CBX that the student sat for, three scale scores were extracted: Total, Written and MBE. In addition, the student's raw scores on each of the individual essays, performance tests, and MBE subtests (expressed as percentiles in 2017) were also extracted. Finally, an indicator of whether the student was a first-time taker or repeater on the given exam was extracted.

Finally, all data files were merged to form a single analytic file containing one record per student per examination occurrence. Some additional derived variables (e.g., student age at the point of the examination, subject matter areas for the individual essays and performance tasks) were added to single analytic file for use in the final analyses. Applicant names were removed from the final file before being provided to the Principal Investigator for data analysis in mid-June 2018. Refer to Appendix 4 to see the overall summary of the chronology of events leading up to the final data collection.

Appendix 9

CBX Outcomes Descriptive Statistics by Student Characteristics

<u>Characteristic</u>	Exam Year																		Pass %
	2013						2016						2017						
	Written		MBE		Total		Written		MBE		Total		Written		MBE		Total		
	Ave	Sd	Ave	Sd	Ave	Sd	Ave	Sd	Ave	Sd	Ave	Sd	Ave	Sd	Ave	Sd	Ave	Sd	
<u>Age</u>																			
<=25	1,576	148	1,528	133	1,559	126	1,504	152	1,481	141	1,496	137	1,529	143	1,491	148	1,510	135	74%
26-27	1,556	137	1,517	135	1,542	122	1,482	147	1,462	141	1,475	133	1,506	145	1,481	141	1,493	130	70%
28-29	1,519	142	1,504	142	1,514	129	1,447	136	1,448	139	1,447	126	1,464	138	1,454	138	1,459	122	62%
>=30	1,469	148	1,492	137	1,477	128	1,409	129	1,435	132	1,418	118	1,431	132	1,449	134	1,440	120	51%
<u>Gender</u>																			
Female	1,519	150	1,528	135	1,522	130	1,451	142	1,478	135	1,460	128	1,462	142	1,477	140	1,470	128	64%
Male	1,538	145	1,490	138	1,521	129	1,463	147	1,434	139	1,452	133	1,488	144	1,458	139	1,473	129	63%
<u>Race</u>																			
Non-Minority	1,547	149	1,533	136	1,542	128	1,479	147	1,478	138	1,478	132	1,490	148	1,482	146	1,486	133	69%
Minority	1,497	141	1,470	131	1,488	124	1,429	137	1,424	134	1,427	124	1,460	137	1,449	131	1,454	120	55%
<u>Major</u>																			
A&H.	1,534	148	1,518	130	1,528	128	1,470	146	1,462	136	1,467	131	1,475	143	1,462	139	1,468	128	66%
Business	1,532	145	1,501	140	1,521	128	1,438	133	1,453	134	1,443	120	1,468	147	1,472	145	1,470	133	63%
Nat. Science	1,557	157	1,539	140	1,550	135	1,488	156	1,503	129	1,493	137	1,500	139	1,523	150	1,511	134	71%
Soc. Science	1,521	145	1,502	139	1,515	128	1,454	148	1,448	142	1,452	134	1,478	144	1,464	140	1,471	128	62%
Other	1,523	165	1,506	155	1,517	146	1,420	99	1,430	134	1,424	101	1,464	149	1,477	129	1,470	123	56%
<u>Part Time?</u>																			
No	1,536	146	1,514	137	1,529	128	1,466	146	1,460	141	1,464	132	1,484	145	1,470	142	1,477	130	66%
Yes	1,454	141	1,460	129	1,457	121	1,394	118	1,416	119	1,402	106	1,424	123	1,441	125	1,433	110	45%
<u>Transfer?</u>																			
No	1,528	149	1,507	138	1,520	131	1,456	145	1,454	139	1,455	131	1,475	145	1,465	141	1,470	129	63%
Yes	1,537	127	1,539	133	1,537	108	1,473	142	1,468	134	1,471	125	1,494	125	1,485	120	1,490	110	73%
<u>Regular Prg.</u>																			
Yes	1,536	147	1,515	137	1,529	128	1,467	147	1,461	141	1,465	133	1,486	145	1,472	141	1,479	130	66%
No	1,468	142	1,467	129	1,468	124	1,402	117	1,417	120	1,407	105	1,426	124	1,436	129	1,431	112	47%
<u>Concentration</u>																			
Yes	1,526	149	1,506	140	1,519	131	1,454	146	1,450	139	1,453	132	1,474	146	1,466	140	1,470	130	63%
No	1,535	144	1,520	128	1,530	122	1,467	141	1,466	137	1,467	128	1,484	136	1,468	139	1,476	124	65%

Appendix 10

CBX Descriptive Statistics by Undergraduate GPA scores ranges ^a, Adjusted First Year and Final Law School Grade Points Averages

	<u>MBE</u>									<u>Written</u>						<u>Total Score</u>						<u>Pass Rate</u>		
	<u>2013</u> (N=2,675)			<u>2016</u> (N=2,327)			<u>2017</u> (N=2,351)			<u>2013</u>		<u>2016</u>		<u>2017</u>		<u>2013</u>		<u>2016</u>		<u>2017</u>		<u>2013</u>	<u>2016</u>	<u>2017</u>
	<u>% Test Takers</u>	<u>Ave.</u>	<u>Sd</u>	<u>% Test Takers</u>	<u>Ave.</u>	<u>Sd</u>	<u>% Test Takers</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>%</u>	<u>%</u>	<u>%</u>
<u>UGPA</u>																								
<u>Range</u>																								
< 3.10	20%	1,469	129	24%	1,426	130	24%	1,433	137	1,447	136	1,410	122	1,443	137	1,455	118	1,415	113	1,438	123	56%	40%	51%
3.10 - 3.36	20%	1,483	141	21%	1,446	132	22%	1,452	132	1,499	138	1,442	129	1,467	133	1,493	124	1,443	118	1,460	118	69%	50%	59%
3.37 - 3.55	20%	1,507	134	21%	1,471	139	19%	1,474	134	1,520	146	1,483	150	1,488	143	1,516	126	1,478	134	1,481	126	75%	61%	66%
3.56 - 3.72	20%	1,523	136	18%	1,491	139	17%	1,486	144	1,540	143	1,493	157	1,500	152	1,534	127	1,492	140	1,493	135	77%	66%	68%
> 3.72	20%	1,546	134	16%	1,497	145	18%	1,533	135	1,574	145	1,510	159	1,539	153	1,564	125	1,505	142	1,536	130	85%	68%	78%
<i>All</i>	100%	1,506	138	100%	1,463	139	100%	1,472	140	1,516	148	1,463	147	1,483	146	1,513	130	1,463	132	1,478	130	73%	56%	63%

^a Score ranges are quintiles based on the distribution of student Undergraduate GPAs sitting for the 2013 CBX.

CBX Descriptive Statistics by Undergraduate GPA scores ranges, Adjusted First Year ^a and Final Law School Grade Points Averages

	<u>MBE</u>									<u>Written</u>						<u>Total Score</u>						<u>Pass Rate</u>		
	<u>2013</u> (N=2,675)			<u>2016</u> (N=2,327)			<u>2017</u> (N=2,351)			<u>2013</u>		<u>2016</u>		<u>2017</u>		<u>2013</u>		<u>2016</u>		<u>2017</u>		<u>2013</u>	<u>2016</u>	<u>2017</u>
	<u>% Test</u> <u>Takers</u>	<u>Ave.</u>	<u>Sd</u>	<u>% Test</u> <u>Takers</u>	<u>Ave.</u>	<u>Sd</u>	<u>% Test</u> <u>Takers</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>%</u>	<u>%</u>	<u>%</u>
<u>Adj 1st Yr</u> <u>GPA</u>																								
<2.65	20%	1,398	124	22%	1,368	125	22%	1,373	128	1,406	120	1,367	103	1,384	123	1,404	102	1,367	95	1,378	109	37%	23%	32%
2.65-2.87	19%	1,447	120	21%	1,412	121	22%	1,422	120	1,462	119	1,409	118	1,439	121	1,457	101	1,410	105	1,431	103	59%	40%	49%
2.88-3.14	20%	1,500	115	19%	1,462	121	17%	1,472	115	1,514	129	1,455	128	1,484	128	1,509	107	1,457	112	1,478	107	79%	56%	66%
3.15-3.43	21%	1,552	109	21%	1,504	114	22%	1,519	113	1,563	128	1,502	131	1,528	133	1,559	104	1,502	111	1,524	107	89%	74%	81%
>3.43	20%	1,622	106	18%	1,589	107	17%	1,602	106	1,626	141	1,604	140	1,605	128	1,625	112	1,599	115	1,604	102	95%	93%	95%
<i>All</i>	100%	1,505	139	100%	1,462	140	100%	1,472	141	1,515	149	1,462	147	1,483	147	1,511	131	1,462	133	1,478	130	72%	56%	63%

Score ranges are quintiles based on the distribution of student adjusted first year law school GPA sitting for the 2013 CBX.

CBX Descriptive Statistics by Undergraduate GPA scores ranges, Adjusted First Year and Final Law School Grade Points Averages ^a

	<u>MBE</u>									<u>Written</u>						<u>Total Score</u>						<u>Pass Rate</u>		
	<u>2013</u> (N=2,675)			<u>2016</u> (N=2,327)			<u>2017</u> (N=2,351)			<u>2013</u>		<u>2016</u>		<u>2017</u>		<u>2013</u>		<u>2016</u>		<u>2017</u>		<u>2013</u>	<u>2016</u>	<u>2017</u>
	<u>%</u>	<u>Ave.</u>	<u>Sd</u>	<u>%</u>	<u>Ave.</u>	<u>Sd</u>	<u>%</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>Ave.</u>	<u>Sd</u>	<u>%</u>	<u>%</u>	<u>%</u>
<u>Adj Final GPA</u>																								
<2.80	20%	1,381	125	21%	1,352	119	21%	1,363	126	1,388	114	1,352	103	1,367	116	1,386	98	1,352	92	1,365	105	30%	17%	26%
2.80-3.03	20%	1,451	110	22%	1,412	120	21%	1,415	116	1,459	118	1,407	111	1,439	118	1,457	96	1,409	100	1,427	100	60%	38%	48%
3.04-3.27	21%	1,500	109	21%	1,460	112	22%	1,469	108	1,517	119	1,457	119	1,479	124	1,511	97	1,458	102	1,474	99	80%	59%	66%
3.28-3.51	19%	1,559	99	18%	1,518	108	19%	1,534	104	1,568	120	1,516	125	1,542	120	1,565	95	1,517	105	1,538	95	93%	79%	87%
>3.51	20%	1,633	95	18%	1,596	97	17%	1,608	102	1,636	132	1,608	137	1,613	128	1,635	102	1,603	109	1,611	99	97%	94%	97%
All	100%	1,505	139	100%	1,462	139	100%	1,472	141	1,514	148	1,462	147	1,482	146	1,510	130	1,462	132	1,477	130	72%	56%	63%

^a Score ranges are quintiles based on the distribution of student adjusted final law school GPA sitting for the 2013 CBX.

Appendix 11

Methodology for Evaluating Bivariate Statistical Relationships

To evaluate the relationships between bar performance and the non-continuous measures (e.g., Ethnicity), we constructed a series of two factor Analysis of Variance (2-Way ANOVA; also referred to as a Fixed-effect General Linear Model) where the independent variables were examination year and the particular student characteristic/attribute of interest and the dependent variable was the bar outcome. The model testing proceeded in three steps.

In the first step, a baseline model was built that included only the administration year. In the second step, another model was constructed that included administration year and added a main effect for the characteristic/attribute being assessed. We interpreted a “significant” main effect for the factor of interest in this model to mean that it exhibited a statistical relationship to the CBX outcome. A “non-significant” effect was interpreted as a lack of relationship between with the examination outcome and the factor. In the final step, we constructed a third model that included the interaction of administration year and the factor of interest. We interpreted a “significant” interaction to mean that the relationship between the factor and the bar outcome lacked stability and varied in some manner from CBX administration to CBX administration.

For the antecedent factors that were measured on a continuous scale (i.e., LSAT, Undergraduate GPA, law school 1st Year and graduating GPA), we examined both the linear relationships using correlation coefficients (Pearson or point-biserial) and potential non-linear relationships by stratifying the continuous measures into more discrete groupings (examined in the analysis described above). We first tested whether the correlations were statistically different than zero for each administration. We then examined the stability of these relationships by statistically testing whether the correlations between the same two variables, calculated for different administrations were significantly different from each other³⁷. For example, we evaluated whether the correlation between LSAT and CBX Total Scale Scores on the 2013 administration was statistically similar or different from that same correlation on the 2016 or 2017 administrations. Separate tests were conducted using each of the student factors discussed in the preceding section for each of the four CBX outcome metrics (i.e., a total of 52 tests).

As with earlier tests, we were concerned that the extremely large number of students included in the model and the large number of tests that were being conducted would result in identifying weak relationships that were statistically significant relationships but with little practical significance. We therefore applied two criteria in our evaluation. For the correlational analysis and effects testing the critical alpha was set at .001. For the GLM

³⁷ Significance testing related to the correlations applied the methods described in Steiger (1980).

model testing, we applied a second criterion that the added effects (main and interaction) each had to add at least 1% to the R^2 value³⁸ of the baseline model.

³⁸ R^2 refers to the percentage of variation in the model and refers to the proportion of variability in the outcome variable that can be accounted for by independent variables in the model. R^2 values range from 0% to 100%. The higher the R^2 value, the larger the relationship

Appendix 12

Methodology for Multivariate Modeling

A similar strategy was used to (a) evaluate the simultaneous impact of student characteristics on each of the CBX outcomes and (b) determine the net effect that they had on the change in performance over the three examinations. For the interested reader, this appendix provides details of the steps that were followed. The results section of the report summarizes the findings, focusing on the activities conducted in each step.

1. All student characteristics were categorized into groupings. The groupings were considered to have a sequential order, relative to when a student sat for the CBX. These included:
 - a. *Demographic attributes*, including gender, ethnicity, age at the time the CBX was taken, examination
 - b. *Pre-law school credentials* including undergraduate GPA, undergraduate major, and LSAT
 - c. *Characteristics of school experience*, including whether or not the student attended part-time, was part of the regular day time program, had an area of concentration, graduated within 3 years of the primary matriculating cohort
 - d. *Law School performance*, including adjusted 1L GPA and adjusted GPA upon graduation
 - e. *Examinee status*, referring to whether the student was sitting for the first time or repeating the CBX.
2. For each CBX outcome, the bivariate relationships of the variables within each grouping (reported under Research Question 3 in the Results Section) were examined for both statistical significance and comparability over the three administrations.
3. Based upon a lack of statistical significance in the preliminary modeling of the characteristics of law school experience category, three of the variables (area of concentration, transfer in status, and graduated within 3 years of matriculation) were dropped from further consideration. The variable indicating whether the student was part of the regular day time, was part of the secondary dataset and missing from a significant percentage of the records. Data on a third variable from the secondary dataset, Undergraduate Major was not provided by three of the 11 schools.

We conducted a preliminary multivariate regression analysis that included the remaining two “School Experience” variables along with others to determine if they would continue to be predictive in the presence of stronger explanatory measures

(e.g., LSAT). Neither of the variables were found to significantly contribute be non-significant and were dropped from further modeling.

4. At that point, in preparation for the sequential multivariate testing (see next step), the analysis sample was pared down to a subsample of case having complete information on the remaining analysis variables. The analysis sample was reduced from 7,563 to 7,313. A χ^2 significance test indicated that the proportion of students coming from each school tested in each of the three years had not changed ($p=.48$).
5. For each CBX outcome, a series of regression models were formulated and then tested on all 7,313 students. The first model consisted of demographic variables alone. The next model, included demographics and the entering law school credentials. Each subsequent model added another grouping of variables. The final two models added an effect for school, and then repeater status. The R^2 (i.e., percentage of variation) was evaluated for each model and recorded³⁹. Logistic regression was used to model the dichotomous CBX pass vs. fail outcome.
6. At the final step, the statistical significance of each independent variable was then evaluated. Non-significant variables ($\alpha=.01$) were dropped from further model development.
7. The interaction of administration year with all significant explanatory variables were then added to the model and evaluated for statistical significance. Both statistical significance of the interaction effects and the incremental R^2 (over the final model without interactions) was evaluated. No interactions were statistically significant and none of the more complicated models added further explanatory power. This suggested that the same statistical adjustments could reliably be applied to the CBX scores for all administrations.
8. Additional exploratory analyses were conducted with various derivatives of the variables including non-linear effects (e.g., LSAT²) and measures intended to simulate performance change while in law school (e.g., Final GPA – 1L GPA). None of the exploratory models added anything to the exploratory value of the models.
9. In the next step, Analysis of Covariance (ANCOVA) models were tested. ANCOVA modeling is used in comparing differences between groups (e.g., administration years) when (a) there are other variables known to be related to the outcome being tested (e.g., CBX scores), (b) there are known imbalances in the composition of the groups (e.g., higher concentrations of repeating test-takers in the

³⁹ For all modeling of CBX pass/fail outcomes, which can take on only two values (0 for failing and 1 for passing), Logistic Regression models were applied. The “pseudo R^2 ” from that modeling approached was used.

different administrations), and (c) more precision is required in performing the group comparisons. A key assumption of ANCOVA analysis is that the relationships between the explanatory variables and the outcomes are consistent within each of groups being tested.

The ANCOVA models assigned administration year as a “fixed” effect, and the statistically significant antecedent variables from the previous steps as covariates. To assure that the “consistency of relationship” assumption was met, the interaction of administration year and the covariates were re-evaluated (see Step 7). A statistically non-significant interaction is considered evidence that the assumption has been met. *No interactions were found to be statistically significant* for any of the models.

10. Using the results from the ANCOVA models, “adjusted” scores were calculated. The resulting scores were then used to calculate “adjusted” or “least square” means for each scale score on each administration. Similarly, “adjusted” or “least square” passing rates were calculated. These “adjusted” means represented the average performance on each CBX *after accounting for the student attributes that were antecedent to the examination*. The adjusted outcomes for each administration year were then compared to the actual results to determine what percentage of the observed decrease between administrations could be accounted for by the models.