Graduate Management Admission Council®

validity study service

Report created for: XYZ University Full-Time MBA Program Class of 2003

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This report has been created for XYZ University based on data submitted about the Class of 2003

Validity Study for XYZ University, Full-time MBA Program, Class of 2003

Overview

This report is designed to help you make informed decisions concerning your admissions process. It examines the effectiveness of the Graduate Management Assessment Test[®] (GMAT[®]) examination and a limited set of other information as predictors of mid-program grade point average for students in XYZ University, full-time MBA program, class of 2003. This report also provides—

- an estimate of the relative importance of each of the variables in predicting success;
- analysis by gender, age, and citizenship;
- expected and observed scores for specially admitted students; and
- a table to aid in identifying students who may be at risk of experiencing academic difficulties.

To the extent that future classes are similar to the one studied, this report generalizes beyond the class of 2003.

The GMAT[®] assessment is just one of many sources of data used by admissions professionals to help determine the fit of each individual candidate with your full-time MBA program. It serves as a set of objective information in the data mix and is often the single best predictor of academic success. How well the GMAT[®] exam works and the decision of how to optimally weight the GMAT[®] scores and other variables must be investigated for each individual program that uses the exam to assess applicants.

The correlation of mid-program grades with the combination of GMAT[®] scores, undergraduate grade point average and years of work experience for your program is 0.708. This combination predicts quite well. In admissions, multiple correlations of 0.30 to 0.40 are considered good.

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Other key findings for your program:

- GMAT[®] scores are better predictors than undergraduate grade point average;
- GMAT[®] Quantitative scores are better predictors than GMAT[®] Verbal scores; and
- the predictive validity for the GMAT[®] exam is comparable for domestic and nondomestic students, male and female students, and older and younger students.

There are several critical limitations to the study. It does not evaluate the attainment of other goals of the admissions program. The study investigates just one outcome measure, mid-program grades. The study also does not quantify or evaluate other admissions criteria such as the results of an interview, quality of prior work experience, or rigor of previous educational programs.

Validity Study for XYZ University, Full-time MBA Program, Class of 2003

Introduction

This validity study report describes the ability of select admissions factors to predict academic success as measured by grades at the end of the first half of your program.

Information from this study can be used to evaluate current admission procedures, determine appropriate weights for admission factors for applicants, and help identify students who may be at risk for academic difficulty. The report provides some suggestions and possible interpretations that may be helpful to staff in deciding on appropriate actions.

The analysis is based on the following information:

Students

- Information from 162 students of the Class of 2003 was used in this report.
 - Of these, 101 students were male, 61 students were female, and 0 were not specified.
 - 103 students were listed as domestic students, 59 as non-domestic students, and 0 were not specified.

Admissions factors

- Information was provided on six admissions factors:
 - o Undergraduate GPA (UGPA)
 - o Number of years of work experience
 - Four separate GMAT[®] scores: Verbal, Quantitative, Total, and Analytical Writing Assessment (AWA)

Academic success

• Information was provided on one measure of academic success: Mid-program GPA.

Analyses Using All Students

Individual and combined predictors

Mid-program GPA is the average of grades halfway through your program. Typically, this is the equivalent of the end of the first year of a two-year program.

The following table shows the correlation of select admission factors with Mid-program GPA for your program.

Simple and multiple corre	lations of sel	ect variables with mid-program grades.
Variables	Predictive	Chart
	Value	
UGPA	0.377	
Total	0.635	
UGPA + Total + AWA + Work	0.708	
Verbal + Quantitative	0.511	
UGPA + Verbal + Quantitative + AWA + Work	0.596	
Note: Based on 162 students	•	•

- Correlations can range from -1.00 to 1.00 and measure the strength of the prediction.
- Because many factors determine student success, correlations of 0.30 to 0.40 are considered good for admissions into an academic program.
- Although GMAT[®] Total is a better individual predictor than undergraduate GPA, the best prediction results when factors are combined.
- For your program, undergraduate GPA together with GMAT[®] Total, GMAT[®] AWA scores, and Work Experience do an excellent job of predicting mid-program grades.
 - The predictive validity of using the GMAT[®] Total, undergraduate GPA, AWA, and Work score for your program is 0.708.

- Adding the number of years work experience to the combination did not appreciatively increase the predictive validity.
- Your admission process effectively selects students who will perform well.
 - If a random sample of applicants was admitted, approximately 12.6% of the students would have scored under 3.00. Your selection process resulted in only 5.6% of the students scoring under 3.00—a 225% improvement.
 - Approximately 76% of your admitted students scored higher than the expected average would have been if a random sample of applicants had been admitted.
- The predictive validity of the GMAT[®] Total is rarely the same as the validity of the GMAT[®] Quantitative and Verbal combined
 - Although the GMAT[®] Total score is the sum of the raw scores for Quantitative and Verbal, each of these numbers are scaled separately. As a result, the sum of the scaled section scores—which are the reported scores—is not the same as the scaled total score.

Contribution of Predictors

• The relative importance of each variable can be viewed as optimal weights for predicting Mid-program GPA for incoming students in your program. The optimal weights vary depending on which variables you choose to consider.



- GMAT[®] Total is more important than the other variables.
 - GMAT[®] Quantitative is the most important variable when the section scores are considered.
- GMAT[®] Total and undergraduate GPA contribute the most to the prediction.
 - AWA does not add appreciably to what is already being contributed by GMAT[®] Total.
 - An AWA essay may be informative in other ways, such as when using an essay as a writing sample.
 - Number of years of work experience does not contribute substantially to the prediction.
 - Qualitative work experience factors are often more informative than length of work experience.

Analyses for Groups of Students

Citizenship

Combinations of factors based just on the GMAT[®] test for domestic and non-domestic students were examined for their predictive validity by group.



- The predictive value for the combination with all the variables is similar for domestic and non-domestic students.
 - The best combination of predictors for both domestic and non-domestic students included multiple predictors.
 - Domestic: Total + AWA = 0.65
 - Non-domestic: Total + AWA = 0.67
 - The combination with GMAT[®] Total has better predictive validity than the combination with GMAT[®] section scores for domestic students.
 - The combination with GMAT[®] Total has better predictive validity than the combination with GMAT[®] section scores for non-domestic students.

The relative importance of the GMAT[®] section scores as predictors of mid-program grade point average differs little by citizenship.



• When only GMAT[®] Quantitative, GMAT[®] Verbal, and GMAT[®] AWA scores are used, the Quantitative scores are the single most important predictor variable for domestic students.

- When just GMAT[®] Quantitative, GMAT[®] Verbal, and GMAT[®] AWA scores are used, the Quantitative scores are the single most important predictor variable for non-domestic students.
- AWA contributed more to the prediction for non-domestic students than it did for domestic students.

Gender

Combinations of factors based on the GMAT[®] test, undergraduate grade point average, and work experience for male and female students were examined for their predictive validity by group.



- The predictive value for the combination with all the variables is similar for male and female students.
 - The best combination of predictors for both male students and female students included multiple predictors.
 - Male: Total + AWA + UGPA + Work = 0.60
 - Female: Verbal + Quantitative + AWA + UGPA + Work = 0.59
 - The combination with GMAT[®] Total is has better predictive validity than the combination with GMAT[®] section scores for male students.
 - The combination with GMAT[®] Total is has better predictive validity than the combination with GMAT[®] section scores for female students.

The relative importance of the GMAT[®] section scores, work, and UGPA as predictors of midprogram grade point average differs by gender.



- Among GMAT[®] sections, the Quantitative scores are the most important predictor variable for male students.
- Among GMAT[®] sections, the Quantitative scores are the most important predictor variable for female students.
- AWA contributed more to the prediction for male students than it did for female students.
- Undergraduate GPA contributed more to the prediction for male students than it did for female students.

Age

Combinations of factors based on the GMAT[®] test, undergraduate grade point average, and work experience for younger students (ages less than 30) and older students (ages 30 or above) were examined for their predictive validity by group.



- The predictive value for the combination with all the variables is similar for younger and older students.
 - The best combination of predictors for both younger students and older students included multiple predictors.
 - Younger: Total + AWA + UGPA + Work = 0.60
 - Older: Verbal + Quantitative + AWA + UGPA + Work = 0.59
 - The combination with GMAT[®] Total is has better predictive validity than the combination with GMAT[®] section scores for younger students.
 - The combination with GMAT[®] Total is has better predictive validity than the combination with GMAT[®] section scores for older students.

The relative importance of the GMAT[®] section scores, work, and UGPA as predictors of midprogram grade point average differs by age.



- Among GMAT[®] sections, the Quantitative scores are the most important predictor variable for younger students.
- Among GMAT[®] sections, the Quantitative scores are the most important predictor variable for older students.
- AWA contributed more to the prediction for younger students than it did for older students.
- Undergraduate GPA contributed more to the prediction for younger students than it did for older students.

Specially admitted students

On average, specially admitted students did better than expected based on their GMAT[®] scores, undergraduate grade point average, and work experience.

Observed and expected mean mid-program GPA for specially admitted students								
		Mid-Program Grade Point Average Mean Chart						
	N							
Specially Admitted Students								
Expected	20	2.21						
Actual	20	2.67						

- Although the admission process works well overall, the impact on individual students varies.
 - Applicants whose unique characteristics prompted special admission performed better than would be expected given their profiles.
 - The admissions factors examined here do not represent a complete picture; applicants should be evaluated with all possible sources of information taken into consideration.

Probability of Success

Identifying whether a potential student's grades are likely to fall in the bottom quarter of the class can aid in determining who may be at risk for experiencing academic difficulty. The following table provides estimates of the probability that a student's mid-program grades will be in the lowest quarter of the class based on just two admissions variables: GMAT[®] Total and undergraduate GPA.

Probability a student will have a mid-program grade point average in the lowest quartile, given their undergraduate GPA and GMAT [®] Total score.										
-	Undergraduate GPA									
GMAT [®] Total	2.50	2.75	3.00	3.25	3.50	3.75	4.00			
200	0.99	0.99	0.99	0.99	0.99	0.99	0.99			
250	0.99	0.99	0.99	0.99	0.99	0.99	0.99			
300	0.99	0.99	0.99	0.99	0.99	0.99	0.99			
350	0.99	0.99	0.99	0.99	0.99	0.99	0.99			
400	0.99	0.99	0.99	0.99	0.99	0.98	0.96			
450	0.99	0.98	0.97	0.94	0.91	0.86	0.79			
500	0.93	0.89	0.83	0.76	0.67	0.57	0.47			
550	0.73	0.63	0.53	0.43	0.33	0.24	0.17			
600	0.39	0.29	0.21	0.14	0.09	0.06	0.03			
650	0.12	0.08	0.04	0.03	0.01	0.01	0.01			
700	0.02	0.01	0.01	0.01	0.01	0.01	0.01			
750	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
800	0.01	0.01	0.01	0.01	0.01	0.01	0.01			

If a student's exact GMAT[®] score or undergraduate GPA is not listed, then either choose the closest values or extrapolate the probability value.

- The table is based only on two scores. A careful examination of other admissions information, including scores in the different sections of the GMAT[®] exam, will provide additional insights into potential students' future performance.
- If an applicant is projected to be at risk, the program staff may choose one of a number of possible actions, such as denying admission, conditionally admitting, providing tutoring in needed areas, or assigning a mentor or coach.

Comparisons with Other Programs

The following chart shows a comparison of the results for your program with the results of 244 recent validity studies of other programs. These studies involved more than 35,000 students.

Predictive validities for select variables and combinations for your program and for all programs									
	All	Programs (1997–20	003)	Vour Program					
	25 th %ile	Median	75%ile	1001 Frogram					
UGPA	0.192	0.285	0.376	0.377					
Total	0.371	0.456	0.557	0.635					
Total + AWA	0.402	0.476	0.572	0.668					
Total + AWA + UGPA	0.456	0.520	0.633	0.707					
Verbal	0.228	0.329	0.418	0.350					
Quantitative	0.240	0.351	0.451	0.470					
Verbal + Quantitative	0.363	0.452	0.549	0.511					
Verbal + Quant + AWA	0.382	0.477	0.566	0.538					
Verbal + Quant + AWA + UGPA	0.448	0.521	0.623	0.590					

- The predictive validity of the GMAT[®] Total score alone is higher for your program compared with most other programs.
- The predictive validity of the GMAT[®] Total combined with AWA and UGPA is higher for your program compared with most other programs.
- The predictive validity of the GMAT[®] Verbal score alone is higher for your program compared with most other programs.
- The predictive validity of the GMAT[®] Quantitative score alone is higher for your program compared with most other programs.

The GMAT[®] exam is used as an admissions tool by a wide range of graduate business programs. Consequently, these benchmarks should be interpreted with caution.

- The data combine all program types. Full-time and executive MBA programs typically have the highest predictive validities.
- While the average predictive validities for GMAT[®] Quantitative and GMAT[®] Verbal scores are comparable, one or the other section score typically predicts better for an individual program.
- There are many factors that affect the validity that will be observed for a particular program.
 - Differences in the scholastic abilities of the student body.
 - If all admitted students have similar application profiles, it is difficult to predict differences among them, resulting in *lower predictive validity*.
 - If there is a great deal of variation among students, it is easier to predict performance, resulting in *higher predictive validity*.
 - Differences in grades and grading practices.
 - If grading policies are inconsistent, it is difficult to predict grades, resulting in *lower predictive validity*.
 - If students must maintain a minimum grade point average, there is a smaller range of possible grades for the student body, resulting in *lower predictive validity*.
 - If students are able to receive both low and high grades, there will be more differences that can be detected, resulting in *higher predictive validity*.
 - Factors that cannot be measured numerically.
 - Lower predictive validity may result if factors such as interviews, personal essays, or recommendations are factored heavily into the admission decision. The program would likely see *higher validity* if these factors were measured and combined with the standard factors examined here.

Implications

- Undergraduate GPA and GMAT[®] scores are good predictors of mid-point academic success and are therefore useful as admissions factors.
- Number of years of work experience can be misleading.
 - If an individual has been away from school for a long period of time, examine factors that would indicate whether he or she is ready for an academic program.
 - Look at factors of work experience other than length.
- Emphasis should be on different admissions factors depending on the individual student and the program to which he or she is applying.
 - Confidence in the admission factors is especially high for female students; pay special attention to GMAT[®] Quantitative scores
 - Differences in GMAT[®] AWA and undergraduate GPA are especially important for male students
 - GMAT[®] Verbal and AWA should be weighted more heavily for younger applicants, whereas special attention to GMAT[®] Quantitative scores for older applicants is warranted.
- Identifying students who may be at-risk for academic trouble is a first step to taking actions that can improve both retention and satisfaction with the program.
 - Admissions factors such as GMAT[®] section scores or grades in particular undergraduate courses can guide admissions staff in making determinations about how to proceed with these applicants.
- The admissions factors used in this study do not represent the complete picture.
 - There is considerable variance left unexplained by the admissions factors assessed.
 - o Consider conducting another study and including additional variables.

Technical Notes

 Bivariate correlations with mid-program grade point average were adjusted for restriction in range following the equations provided in Hunter and Schmidt (1990), page 127. Estimates for the population variances were based on all students sending GMAT[®] scores to your program.

$$r_{ij}^* = \frac{U r_{ij}}{\sqrt{(U^2 - 1) r_{ij}^2 + 1}}$$

where r_{ij}^{*} is the adjusted bivariate correlation of variables i and j, r_{ij} is the observed bivariate correlation, and

$$U = \frac{\sigma_{pop}}{\sigma_{obs}}$$

- 2. The regression equations for your program are
 - a. MPGPA= 2.31 + 0.001 * Total + 0.018 * AWA + 0.080 * UGPA + 0.018 * Work
 - b. MPGPA= 2.34 + 0.007*Verbal + 0.009*Quantitative + 0.016*AWA + 0.081 *UGPA + 0.018 * Work
- 3. The Pratt Index of the relative importance of variables is

$$PI_i = \frac{r_i^{T}\beta_i}{R^2}$$

where r_{ij} is the adjusted bivariate correlation of predictor variable i with criterion variable j;

 β_i is the standardized beta weight for variable I; and

 R^2 is the squared multiple correlation of the set of variables with j.

References

- Hunter, J. E., and F. L. Schmidt. *Methods of meta-analysis: Correcting error and bias in research findings.* Newbury Park, Ca.: Sage Publications, 1990.
- Johnson, J. W., and J. M. LeBreton. 2004. "History and use of relative importance indices in organizational research." *Organizational Research Methods* 7: 238–257.
- Thomas, D. R., E. Hughes, and B. D. Zumbo. 1998. "On variable importance in linear regression." *Social Indicators Research* 45:253–275.

Appendix

A. Descriptive Statistics by Group

	UGPA	Verbal	Quant	AWA	Total	Work	MPGPA
All	3.22 (0.35)	32 (7)	40 (6)	4.4 (0.8)	598 (51)	3 (3)	3.37 (0.27)
Male	3.17 (0.36)	33 (7)	40 (6)	4.5 (0.8)	604 (54)	3 (2)	3.37 (0.27)
Female	3.30 (0.33)	32 (7)	39 (6)	4.2 (0.8)	589 (46)	3 (4)	3.39 (0.26)
Domestic	3.06 (0.35)	31 (6)	38 (6)	4.4 (0.7)	587 (55)	3 (3)	3.34 (0.25)
Non- Domestic	3.30 (0.33)	33 (7)	40 (6)	4.4 (0.9)	603 (49)	3 (3)	3.39 (0.27)
Younger (<30)	3.06 (0.35)	31 (6)	38 (6)	4.4 (0.7)	587 (55)	3 (3)	3.34 (0.25)
Older (=>30)	3.30 (0.33)	33 (7)	40 (6)	4.4 (0.9)	603 (49)	3 (3)	3.39 (0.27)

Table A-1. Mean (Standard deviation)

B. Adjusted Correlation Tables

	MPGPA	Total	AWA	UGPA	Verbal	Quant	Work
MPGPA	1.000						
Total	0.635	1.000					
AWA	0.023	0.344	1.000				
UGPA	0.377	0.255	0.125	1.000			
Verbal	0.350	0.805	0.484	0.139	1.000		
Quant	0.470	0.831	0.093	0.269	0.345	1.000	
Work	0.078	0.078	0.120	0.011	0.020	0.030	1.000

Table B-1. All students

Table B-2. Domestic Students

	MPGPA	UGPA	Verbal	Quant	AWA	Total	Work
MPGPA	1.000						
UGPA	0.187	1.000					
Verbal	0.290	-0.114	1.000				
Quant	-0.045	0.285	-0.084	1.000			
AWA	0.345	0.018	0.099	-0.096	1.000		
Total	0.197	0.173	0.678	0.559	0.166	1.000	
Work	-0.222	-0.296	0.125	0.171	-0.196	0.154	1.000

Table B-3. Non-Domestic Students

	MPGPA	UGPA	Verbal	Quant	AWA	Total	Work
MPGPA	1.000						
UGPA	0.217	1.000					
Verbal	-0.125	0.097	1.000				
Quant	0.360	0.021	-0.454	1.000			
AWA	0.066	0.008	0.450	-0.260	1.000		
Total	0.243	0.147	0.557	0.442	0.172	1.000	
Work	-0.117	0.026	0.054	-0.235	-0.051	-0.179	1.000

	MPGPA	UGPA	Verbal	Quant	AWA	Total	Work
MPGPA	1.000						
UGPA	0.217	1.000					
Verbal	-0.125	0.097	1.000				
Quant	0.360	0.021	-0.454	1.000			
AWA	0.066	0.008	0.450	-0.260	1.000		
Total	0.243	0.147	0.557	0.442	0.172	1.000	
Work	-0.117	0.026	0.054	-0.235	-0.051	-0.179	1.000

 Table B-4. Male Students

Table B-5. Female Students

	MPGPA	UGPA	Verbal	Quant	AWA	Total	Work
MPGPA	1.000						
UGPA	0.217	1.000					
Verbal	-0.125	0.097	1.000				
Quant	0.360	0.021	-0.454	1.000			
AWA	0.066	0.008	0.450	-0.260	1.000		
Total	0.243	0.147	0.557	0.442	0.172	1.000	
Work	-0.117	0.026	0.054	-0.235	-0.051	-0.179	1.000

Table B-6. Students Younger than 30

	MPGPA	UGPA	Verbal	Quant	AWA	Total	Work
MPGPA	1.000						
UGPA	0.217	1.000					
Verbal	-0.125	0.097	1.000				
Quant	0.360	0.021	-0.454	1.000			
AWA	0.066	0.008	0.450	-0.260	1.000		
Total	0.243	0.147	0.557	0.442	0.172	1.000	
Work	-0.117	0.026	0.054	-0.235	-0.051	-0.179	1.000

Table B-7. Students 30 or Older

	MPGPA	UGPA	Verbal	Quant	AWA	Total	Work
MPGPA	1.000						
UGPA	0.217	1.000					
Verbal	-0.125	0.097	1.000				
Quant	0.360	0.021	-0.454	1.000			
AWA	0.066	0.008	0.450	-0.260	1.000		
Total	0.243	0.147	0.557	0.442	0.172	1.000	
Work	-0.117	0.026	0.054	-0.235	-0.051	-0.179	1.000

C. Relative Importance of select admissions variables

Relative importance of select admissions variables								
Combination	Total	UGPA	AWA	Work	Predictive Value			
Total + UGPA + AWA + Work	0.825	0.180	-0.011	0.005	0.708			
Total + UGPA + AWA	0.830	0.180	-0.011		0.707			
Total + UGPA	0.808	0.191			0.673			
Relative importance is based on the Pratt Index.								

Table C-1. Based on Total, UGPA, AWA and Work

 Table C-2. Based on Verbal, Quantitative, UGPA, AWA and Work

Relative importance of select admissions variables								
Combination	Verbal	Quant	AWA	UGPA	Work Exper			
Verbal + Quant +								
UGPA + AWA +								
Work	0.293	0.409	-0.013	0.293	0.018			
Relative importance is based on the Pratt Index.								

For More Information

Information on GMAT[®] validity, including findings from studies done on different graduate management student populations, can be found on the GMAC[®] Web site at <u>www.gmac.com/VSS</u>.

For more information on GMAT[®] validity or the Validity Study Service, contact—

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