A Better Predictor of Graduate Student Performance in Finance:
Is it GPA or GMAT?

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Abstract

This study explores the relative importance of two widely used predictors of students' academic performance in graduate business programs, GMAT scores and undergraduate GPAs. Results from previous studies have been mixed with respect to overall performance in graduate business programs, but their relative importance as predictors of performance in finance has received little attention in the literature. The results of this study seem to indicate that undergraduate GPAs might be better predictors of overall performance in graduate business programs, and GMAT scores may be better predictors of performance in finance. These findings could have implications for the establishment of appropriate admissions criteria, remedial and prerequisite requirements for particular students, and provide guidance for finance instructors at the graduate level.

1. Introduction

Various factors that have the potential to predict academic performance have been previously explored. Though results have been mixed, students' undergraduate cumulative Grade Point Average (GPA) and overall Graduate Management Admission Test (GMAT) scores seem to have emerged as reasonable predictors of students' performance, with some degree of consistency across several of the published studies. However, no published research has specifically examined the relative importance of each of these factors as predictors of students' performance in a graduate level corporate finance course. The typical graduate level corporate finance course is unique in its content and structure compared to other courses in graduate business programs; therefore, results regarding the relative importance of these two widely used predictors may not apply to students taking the graduate finance course. A better understanding of students' likely performance could have implications for the establishment of appropriate admissions criteria, remedial and prerequisite requirements for particular students, and provide guidance for instructors of finance at the graduate level. Thus, the purpose of this study is to examine differences in the predictive ability of undergraduate cumulative GPA and GMAT scores on the overall course grade earned by students completing a graduate corporate finance course.

2. Related Literature

Results of several earlier studies provide support for the validity of the GMAT as a predictor of graduate student performance, such as Deckro and Woundenberg (1977), Graham (1991),

Paolillo (1982), Youngblood and Martin (1982), and others. Using the Master of Business Administration (MBA) program at Tulane University in New Orleans, Louisiana, the Graduate Management Admissions Council (GMAC) finds that, among potential predictor variables, graduate students' performance can best be explained using students' GMAT scores and undergraduate GPAs (Validity Study Service, 1990). More recent studies, such as Arnold, Chakravarty, and Balakrishnan (1996), Hancock (1999), Yang and Lu (2001), Wright and Bachrach (2003), Koys (2005), Sulaiman and Mohezar (2006), and others provide additional support for this finding.

Some analyst have questioned the theoretical and empirical validity of the approach used by many graduate business programs combining GMAT, GPA, and other quantifiable factors within a formula as a major factor in the admissions process, (Schwan, 1988; Carver and King, 1994). In this context, Dobson, Krapljan-Barr, and Vielba (1999) find that GMAT scores are negative and very poor predictors of MBA student performance in a United Kingdom (UK) business school. Hancock (1999) and Wright and Bachrach (2003) find that women tend to score lower on the GMAT than men, which suggests that gender bias may exist in GMAT scores; however, they observe no difference in academic performance across the gender, a result supported by Yang and Lu (2001) and Sulaiman and Mohezar (2006). Wright and Palmer (1994) find that using a combination of GMAT and GPA may be appropriate across the full range of students, but this method may not be a good predictor of low performers in an MBA program. Using multiple-discriminate analysis, Clayton and Cate (2004) find that undergraduate GPA and GMAT scores play no role in predicting MBA no-shows and graduation success.

When viewed as a whole, previous empirical evidence seems to suggest that undergraduate GPA and GMAT scores may not necessarily be good predictors of performance. This begs the questions: are they good predictors of academic performance in a finance course? And if they are, which of them is the better predictor? This study is intended to shed some light on these issues, and add more pieces to this puzzle.

3. Data and Methodology

The data for this study was collected for a randomly selected sample of graduate students at the University of Central Florida's (Orlando, Florida) graduate business program over a five year period, from 2001 to 2006. Given that performance in graduate level finance is the primary focus of this study, students were selected from a pool of students taught by only one professor to ensure consistency in course content, structure, methods, and grading standards.

The study sample consisted of 193 students for whom complete data was available. For each student included in this study, several variables were collected: course grade earned in the graduate level corporate finance course, which was converted into a numeric value on the same basis used for computation of GPAs; cumulative GPA for all courses taken in the graduate program; total GMAT score, and cumulative undergraduate GPA earned prior to entering the graduate program. Descriptive statistics of these variables are reported in Table 1.

Table 1

Descriptive Statistics of
Variables Analyzed
(n=193)

Variable	Mean	Std. Dev.	Median	Minimum	Maximum
FGRADE	2.98	0.77	3.00	2.00	4.00
GGPA	3.48	0.30	3.45	2.50	4.00
GMAT	528.60	64.66	530.00	300.00	710.00
UGPA	3.28	0.39	3.30	2.10	4.00

FGRADE = grade earned in the graduate finance course, converted to a numeric value, where A=4, B=3, C=2
GGPA = cumulative grade point average earned across all courses in the graduate program
GMAT = total score earned in the Graduate Management Admissions Test
UGPA = cumulative grade point average earned in the prior undergraduate program

To assess relevant relations, six different regression models were applied and estimated using Ordinary Least Squares (OLS), derived from two basic structures, which used two different dependent variables and the same two independent variables. The two basic structures are shown in the following two equations:

$$GGPA_j = a + b_1 GMAT_j + b_2 UGPA_j + \varepsilon_j \qquad (1)$$

and

$$FGRADE_j = a + b_1 GMAT_j + b_2 UGPA_j + \varepsilon_j \qquad (2)$$

where:
  GGPA = cumulative grade point average earned across all courses
      in the graduate program by student *j*,
  FGRADE = grade earned in the graduate finance course by student *j*,
      converted to a numeric value, where A=4, B=3, and C=2,
  GMAT = total score earned in the Graduate Management Admissions Test
      by student *j*,
  UGPA = cumulative grade point average earned by student *j*, in a prior
      undergraduate program.

In the first model structure (equation 1), overall performance in the graduate program (GGPA) is used as the dependent variable. The second model (equation 2) uses performance in the graduate level finance course (FGRADE) as the dependent variable. This first model provides an

opportunity to assess the relations between overall program performance and the two predictor variables (GMAT and UGPA), and the second model narrows the assessment specifically to the relations between performance in the finance course and the two predictor variables.

First, each model (equations 1 and 2) is estimated using multiple regression analysis, including both predictor variables (GMAT and UGPA). Second, each model (equations 1 and 2) is estimated using only one of the predictor variables (GMAT). And third, each model (equations 1 and 2) is estimated using only the other predictor variable (UGPA).

4. Results

Table 2 reports the results for equation one (1) above, which uses overall graduate program GPA as the dependent variable. Panel A reports parameter estimates using multiple-regression and both predictor variables, and Panels B and C respectively report parameter estimates using simple regression and each predictor variable separately. As indicated in Panel A, both GMAT score and undergraduate grade point average (UGPA) are significant predictors (at the 0.001 level) of overall performance in the graduate program, with t-values of 3.63 and 5.34, respectively. Together, these two predictors explain 15.7 percent of the variation in overall student performance, as indicated by overall GPA in the graduate program. This finding is similar to that of Paolillo (1982) who finds that undergraduate GPAs and GMAT scores explain less than 17 percent of variance in graduate GPAs. Similarly, Deckro and Woundenberg (1977) report that undergraduate GPAs and GMAT scores account for less than 15 percent of students' academic performance in graduate management education.

However, when these two predictor variables are regressed separately, the results (Panels B and C) indicate that GMAT scores explain a much smaller proportion of the variation in students' overall academic performance (3.5 percent) than undergraduate grade point averages (10.3 percent). These findings are somewhat different from those observed by some other researchers. For example, Koys (2005) finds that GMAT scores explain over 41 percent of MBA academic performance, but undergraduate grade point averages are much weaker predictors, explaining 8.6 percent of graduate student performance. Conversely, Ahmadi, Raiszadeh, and Helms (1997) find that undergraduate GPAs account for 27 percent, and GMAT scores account for 18 percent of variation in MBA student performance.

Table 2

**Relations Between Students' Graduate Program Overall Performances
and GMAT Scores and Undergraduate GPAs
(n=193)**

$$GGPA_j = a + b_1 GMAT_j + b_2 UGPA_j + \varepsilon_j$$

Panel A:		n=193, Adj. R^2=0.157, F=18.88***	
Variable	Coefficient	t-statistic	p-value
Constant	1.9752	7.87	<0.001
GMAT	0.0011	3.63	<0.001
UGPA	0.2770	5.34	<0.001

Panel B:		n=193, Adj. R^2=0.035, F=8.00***	
Variable	Coefficient	t-statistic	p-value
Constant	2.9853	16.90	<0.001
GMAT	0.0009	2.83	<0.006

Panel C:		n=193, Adj. R^2=0.103, F=23.14***	
Variable	Coefficient	t-statistic	p-value
Constant	2.6452	15.11	<0.001
UGPA	0.2551	4.81	<0.001

*** = significant at the 1% level

GGPA = cumulative grade point average earned by student *j* across all courses in the graduate program
GMAT = total score earned in the Graduate Management Admissions Test by student *j*
UGPA = cumulative grade point average earned by student *j* in a prior undergraduate program

Table 3 reports the results for equation two (2) above, in which the dependent variable is defined as students' performance in the graduate level finance course (only). Panel A reports parameter estimates using multiple-regression and both predictor variables, and Panels B and C respectively report parameter estimates using simple regression and each predictor variable separately. As indicated in Panel A, both GMAT score and undergraduate grade point average

(UGPA) are significant predictors (at the 0.001 level) of overall performance in the graduate program, with t-values of 5.38 and 3.91, respectively. Together, these two predictors explain 16.5 percent of the variation in student performance in the finance course (only), which is slightly more than that observed with respect to their ability to predict performance in the graduate program as a whole (15.7 percent).

Table 3

Relations Between Students' Performances in Graduate Finance and GMAT Scores and Undergraduate GPAs
(n=193)

$$FGRADE_j = a + b_1 GMAT_j + b_2 UGPA_j + \varepsilon_j$$

Panel A:		n=193, Adj. R^2=0.165, F=19.96***	
Variable	Coefficient	t-statistic	p-value
Constant	-0.9320	-1.47	0.143
GMAT	0.0042	5.38	<0.001
UGPA	0.5114	3.91	<0.001

Panel B:		n=193, Adj. R^2=0.102, F=22.90***	
Variable	Coefficient	t-statistic	p-value
Constant	0.9330	2.16	0.032
GMAT	0.0039	4.79	<0.001

Panel C:		n=193, Adj. R^2=0.043, F=9.56***	
Variable	Coefficient	t-statistic	p-value
Constant	1.5767	3.44	<0.001
UGPA	0.4296	3.09	<0.003

*** = significant at the 1% level

FGRADE = grade earned in the graduate finance course by student *j*, converted to a numeric value, where A=4, B=3, C=2
GMAT = total score earned in the Graduate Management Admissions Test by student *j*
UGPA = cumulative grade point average earned by student *j* in a prior undergraduate program

As indicated in Table 3, when the two predictor variables (GMAT and UGPA) are regressed separately, as shown in Panels B and C, the results show that GMAT scores account for a greater proportion of the variation in performance in the finance course (10.2 percent) than undergraduate GPAs, which accounts for much less (4.3 percent). Interestingly, this finding is the complete opposite of that observed with respect to overall performance in the graduate program, as reported in Panels B and C of Table 2, which indicates that undergraduate GPA explains a greater proportion (10.3 percent) than GMAT does (3.5 percent). These findings seem to indicate that important predictors of overall performance in the graduate program may not necessarily be important predictors of performance in the finance course.

5. Conclusion

The reason for this observed superiority in the predictive power of GMAT over undergraduate GPA is not clear. Perhaps one could argue that the GMAT assesses skills and abilities more closely aligned with those required in the graduate finance course, and undergraduate GPA measures skills and abilities more closely aligned with those required for good performance in the graduate program as a whole. Perhaps the GMAT captures quantitative skills that would then translate into better performance in the corporate finance course, which is also quantitative. When viewed together, the results reported in Tables 2 and 3 seem to support this notion.

Because of limitations in data availability, this study focused on the corporate finance course. However, the results of this study suggest that similar tests should be conducted for other specific courses, especially other graduate finance courses. Whether the observed pattern of results extends to other finance courses could be the focus of future research that is intended to build on this work.

Given that GMAT scores and undergraduate GPAs (among other factors) continue to be widely used as predictors of graduate student performance, the results of this study reinforce earlier findings to this effect. Beyond this, however, it seems that GMAT is a much better predictor of performance in the corporate finance course, as opposed to a predictor of overall graduate business program performance. Thus, graduate programs that heavily emphasize finance, either as primary content or as electives, might consider this new finding valuable information. As mentioned earlier, these findings could have important implications for the establishment of appropriate admissions criteria, remedial and prerequisite requirements for particular students, and instructors of finance that is taught in graduate business programs.

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