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## **Human Capital Indicators and Academic Success in Executive MBA Programs: A multi-program study**

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This paper investigates various human capital indicators as predictors of academic success for students in Executive MBA programs. Previous literature has focused on student performance in traditional full-time MBA programs and typically only for a single school. Data was examined from two different universities, with over 130 Executive MBA students. Undergraduate GPA had a statistically significant, positive relation to academic success in the Executive MBA program, while other factors, including GMAT scores and age, were not found to be as important in predicting academic success in the Executive MBA programs.

### **Introduction**

Admission decisions in both traditional and Executive MBA programs are usually made using a process that considers several indicators of the human capital that prospective students possess. These indicators typically include undergraduate grades, Graduate Management Admission Test (GMAT) scores, and work experience. The reliance upon undergraduate GPA and GMAT scores is particularly important in traditional MBA programs for several reasons. First,

Note: We express our appreciation to Daniel Bauer, Kimberly Kuerten, and Felix Verdigets for their work in assembling the dataset, and to our colleagues, particularly Roger Garrison and Steve Caudill, for their comments. Helpful comments were also received from session participants at the EMBA Council 2004 annual meetings in San Francisco.

traditional full-time MBA students will invariably have some academic record from their undergraduate studies to use as an indicator of their academic ability, and given their relatively young age, this GPA will be a recent and therefore hopefully accurate indicator. Second, GMAT scores will provide some indication of academic potential, at least in the first-year MBA courses, as the Graduate Management Admissions Council suggests. However, because of their prominence in many of the methods used in the published rankings of MBA programs, high GMAT scores may be preferred by schools for rankings reasons, irrespective of any ability to accurately predict student performance in the program or thereafter. In addition to GPA and GMAT scores, other indicators about applicants, as identified through an evaluation of their résumés and letters of recommendation, will typically be considered in the admissions process for both traditional MBA and Executive MBA programs.

This study adds to the prior literature by pooling data from two different universities, allowing consideration of whether the indicators of success differ significantly across programs. The paper proceeds with an overview of the history of Executive MBA programs, a review of the most relevant literature, and a discussion of the data and statistical analysis and concludes with findings and recommendations for further research.

### **Executive MBA Programs: Background and Admission Requirements**

The University of Chicago established the first Executive MBA program in 1943. Initially, such programs spread slowly, but significant growth has been the hallmark of the last two decades. In 1981, the Executive MBA Council was established with formative assistance from the American Association of Colleges and Schools of Business International (AACSB International). Between 1999 and early 2004 the Executive MBA Council grew to over 160 member institutions, forty-five of which were outside the United States of America (Boudreau, 2004). As of summer 2005, there were over 240 EMBA programs registered with the Executive MBA Council. (See <http://www.emba.org/index.htm>.)

Executive MBA programs are attractive to students for a number of reasons. One is that the EMBA program structure allows students to continue full-time employment by offering courses at night, on weekends, or through other delivery mechanisms, including distance-learning components, all of which allow students increased flexibility to keep their jobs while attending classes. Another is that the courses often incorporate case-based learning pedagogies, which draw upon the deep expertise of the students themselves. In order to assure the depth and breadth of human capital among the student body, which is desired for highly effective case-based learning, most Executive MBA programs require a substantial amount of professional work experience for admission. A recent survey from the EMBA Council showed that most schools required a minimum of six to eight years of full-time professional work experience, with at least four years in

a supervisory or managerial role. These requirements result in a pool of candidates who typically range in age between 30 and 50 years, with the average EMBA student in his or her mid-30s (Executive MBA Council, 2003). Despite this increased emphasis on professional work experience, depth, and career station, the admissions requirements for many Executive MBA programs still hinge, in large part, on the easily quantifiable GMAT score and undergraduate GPA. The issue that arises is what the relative weights of these different requirements should be across programs, and to what degree, if any, the weighting should vary between traditional and Executive MBA programs. As the older Executive MBA applicants have had a greater opportunity to prove themselves in the professional workplace, they have a demonstrated career record to consider, rather than simply being judged on their potential for success. Taken to the logical limit, since they have a demonstrated career record in business, one may question the relevance of any indicator of potential, whether it is an undergraduate GPA that might be more than a decade old or a standardized test score such as the GMAT.

The GMAT is administered by the Graduate Management Admissions Council (GMAC). The GMAC has sponsored many studies of the validity of the test, and offers a Validity Study Service free of charge to any college or university that uses the GMAT as an admission requirement. Generally, the findings indicate that undergraduate GPA and GMAT scores are good predictors of success in the first year of an MBA program, while the number of years of work experience is not. They suggest that a complete admissions process should delve deeply into the content of the work experience, and that there is considerable variability in academic program success that is not captured in these variables. (For further discussion on these points, see <http://www.gmac.com/gmac/ResearchandTrends/AssessmentResearch/ValidityStudyService.htm>, May 24, 2005). This suggestion seems particularly important for Executive MBA programs. Student profiles in EMBA programs call for substantial and varied work experience. These factors hopefully will add to the diversity and depth of the classroom discussion experience. This may indicate that the traditional GMAT and undergraduate GPA criteria should have less weight relative to well-documented career progress and accomplishment for prospective EMBA students. Nonetheless, it may also be the case that prior academic achievement and GMAT scores are better indicators of success in academic endeavors, such as the EMBA degree program, even if they are not as strongly related to success in the business world.

### **Previous Literature on MBA Student Performance**

There have been numerous studies of the admissions criteria and student performance for MBA programs, and these studies have tried to identify the most useful indicators of success for new MBA students (Gayle and Jones, 1973; Carver and King, 1994; Wright and Palmer, 1994 and 1997; Ahmadi, Raiszadeh and Helms, 1997; and Yang and Lu, 2001). In two of the key earlier studies, Wright and

Palmer (1994, 1997) examined GMAT scores, undergraduate GPAs, and other factors that may help predict academic success for MBAs. Overall, their results showed that GMAT scores and undergraduate GPAs did not appear to adequately discriminate between high- and low-performing students in the MBA classroom. Other empirical results for GMAT scores have not been particularly strong. GMAC itself cites a 20% explanation of variance when GMAT and undergraduate GPA are regressed against first-year MBA program grades. Other researchers have found similarly low levels of explanatory power when GMAT score and MBA student performance are more broadly measured. For example, Gayle and Jones (1973) reported that GMAT scores explained 17% of the variance in overall MBA GPA, while Carver and King (1994) reported that GMAT scores explained only 12.5% of the same variance, and Wright and Palmer (1994) found that GMAT scores explained 18% of the variance in overall MBA GPA.

Reliance on standardized test scores for admission to graduate study has been criticized in broad terms by some authors (Thayer and Khalat, 1998; Sternberg, et. al., 2001). Others have suggested that there may be racial, gender, or cultural differences in standardized test scores, and that enforcing uniform requirements for minimum standardized test scores would lead to racial, gender, or international student imbalances in the profiles of admitted full-time MBA students (Hancock, 1999). Hancock (1999) also investigated the relationship between gender and GMAT score in predicting academic performance and found that while classroom performance was similar among male and female MBA students, women scored significantly lower on the GMAT. There is evidence that the GMAT does have a positive and significant relation to performance in individual MBA classes, rather than the whole program (for example, see Bertus, et. al. 2005, and Gropper, 2005). In a recent study comparing performance among students from different nationalities, Koys (2005) found that the correlation between GMAT score and program success was higher for non-U.S. students than for U.S. students.

With regard to work experience the literature shows conflicting results. As previously noted, GMAC itself states that work experience is poorly correlated with program success. However, Adams and Hancock (2000) found a significant, positive correlation between work experience and MBA performance with work experience being a stronger indicator of MBA program success than GMAT scores and undergraduate GPA. Dugan, et al.(1996) found similar results but suggested further that work experience was more strongly correlated with student success in the most selective graduate programs. Gropper (2005) found that the quantity of work experience (as measured by years of experience) was not a good indicator of student success, but the quality of work was; students who had reached a level of mid-upper management did better both than those at lower levels and those at the highest level. To the extent that more selective graduate schools use other criteria that correlate with the quality and depth of the work experience measured, these results are consistent with the findings of Adams and Hancock (2002).

Given the professional work experience profiles that most prospective Executive MBA students have accumulated, the above results raise questions about what additional information standardized test scores, such as the GMAT, can provide about applicants. A great deal can be discerned about prospective students from their application materials, which often include written statements from applicants and their employers, as well as undergraduate transcripts, letters of recommendation, interviews, and the applicants' résumés. As noted earlier, in comparison to younger full-time students, Executive MBA students have generally had more time to accomplish things in their professional lives; hence their résumés may be more informative with respect to ability and motivation when compared to the résumé of a younger person. It may also be that for adult learners in their 30s, 40s or 50s, the GMAT score is less informative as a predictor of success when compared to the younger, less experienced students who comprise the typical cohort of traditional MBA students. To succeed in an Executive MBA program, characteristics such as discipline, time-management skills, and dedication may be more important than sheer intellectual capacity. Personal interviews, résumés, and letters of recommendation will hopefully reveal information about these characteristics, while a standardized test score is less likely to provide such information.

On the other hand, some researchers have noted that GMAT scores may be preferred by the various accrediting agencies associated with business schools. Accrediting agencies (such as the AACSB International and regional accrediting agencies) might prefer common standards such as GMAT scores to provide some measure of interinstitutional comparability (Wright and Palmer, 1997). Additionally, undergraduate GPA may be a questionable indicator for individual admissions decisions due to variability in grading standards, both across majors and between various undergraduate institutions. There is also some question about how well different undergraduate programs will prepare a student for an MBA program; two A+ students, one in electrical engineering and the other in sociology, may both be quite bright, but their abilities may translate very differently into an MBA program of study. Thus, the GMAT is held out as a standardized, quantifiable, and comparable measure of ability to succeed in an MBA program for applicants coming from colleges and universities with widely different admissions standards, expectations, undergraduate program strengths, or curricula.

## **Data**

Data were obtained from two accredited universities in the Southeast. One was a large, research-intensive university, while the other was smaller, with a mission more tightly focused on teaching. While we do not have a great deal of data, this does provide us an opportunity to compare results across different programs; most of the existing literature considers data only from a single school. (For example, see Adams and Hancock, 2000; Carver and King, 1994; Hancock 1999; and Yang and Lu 2000.)

Table 1 shows descriptive statistics for major variables in the dataset. Data were gathered from 136 students across these two Executive MBA programs, over a period from 1998 to 2003. Both programs have a unified curriculum that is taken in a fixed sequence.

**Table 1.** Descriptive Statistics for Executive MBA dataset

	Mean	Standard Deviation
Age (years)	40.1	6.73
Undergraduate GPA	3.15	0.42
GMAT	514.0	100.6
MBA GPA	3.70	0.45
Race	12.5% non-white	
Gender	16.9% female	

n = 136, 101 from school A and 35 from school B.

As shown in Table 1, the average student in this dataset was just over 40 years of age. The undergraduate GPA averaged 3.15, while the average GMAT score was 514. As with many Executive MBA programs, these students were predominantly male (83.1%, or 118 individuals), and roughly 12.5% (17 individuals) of the students were non-white. Some students dropped out before finishing their EMBA programs. Of the 136 students in the dataset, about 10% (13 individuals) did not finish. Of those who dropped out, some had academic problems, and others left while in good academic standing.

### Statistical Model

We assume that all students who start an Executive MBA program have as their objective graduating with the best grades they can obtain, given the demands on their time and their abilities. We take their EMBA GPA as the primary measurable indicator of student performance in our statistical model, and use this as the dependent variable in our regressions. This practice follows the models used by others. (For example, see Yang and Lu, 2001.)

Student performance in Executive MBA programs depends upon a host of individual factors, as well as external forces with which the student must contend. Individual levels of ability, preparation, diligence, and motivation all factor into program success, from an *a priori* perspective. Of critical interest to the

present study are the various factors that can be taken as indicators of a student's human capital and the extent to which these indicators of human capital are effective predictors of success in the Executive MBA program.

The independent variables explored as possible indicators of human capital include:

1. GMAT score,
2. undergraduate GPA (UGPA), and
3. age.

While they are not perfect measures, standardized test scores and prior grades have been used as proxies for human capital previously (Caudill and Gropper, 1991). Both UGPA and GMAT are expected to be positively related to student performance as measured by EMBA GPA, so that we expect positive coefficient signs in the estimated regression equations. Undergraduate GPA shows a student's demonstrated ability to succeed in an academic program; this should indicate both intelligence and organizational abilities as they apply to academic endeavors. A student's GMAT scores hopefully will provide some evidence regarding a student's ability to perform in the graduate business degree program, or at least in some of the first-year core MBA courses. Age is a proxy for the human capital developed through experience in life and in the workplace. While this measure is obviously imperfect, and perhaps could be improved by using a variable for years of work experience, detailed data on work experience was not available for both sets of school data, while age was. However, the correlation between age and work experience in the data for the one program which had both available was .88; this correlation was statistically significant at greater than the 1% level.

In addition to having the requisite academic talent, students must also have a realistic opportunity to complete the program; major work or family problems can readily arise with EMBA students which may thwart the progress of even the best students. Professional issues such as promotion opportunities, downsizing, or forced relocations, as well as family issues including births, deaths, marriages, divorces, and health problems all can make it difficult for even the most well-prepared students to have an opportunity to finish their degree. Other factors are inherent to the programs themselves. The academic demands of these programs are high, and intellectual prowess is required. Analytical abilities are important, as are verbal and written communication skills. Once a student is engaged in an Executive MBA program, a prime concern is whether the student will have a realistic opportunity to finish the degree program. Balancing work, school, and family obligations can be extremely difficult, and personal and job issues can overwhelm even the best students, leading to sub-par academic performance.

Previous literature also suggests incorporating demographic variables to capture the effects of gender and race; hence male/female and white/non-white



dummy variables were included (Hancock, 1999). Since we are interested in investigating differential impacts of the same indicators across the two programs, we also included a dummy variable (School) for the university at which the EMBA degree program was taken.

Finally, since some students were unable to finish the program, a dummy variable indicating that a student did not complete the degree (Dropout) was included in the model. This variable can be interpreted broadly; it may provide some indication of the opportunity-to-finish concept mentioned above, as most students reported dropping out due to personal or professional demands on their time. It may also provide some indication about student motivation and dedication, albeit after the fact; obviously it could not be a helpful indicator for admission decisions.

## Results

Three model specifications are reported in Table 2. The simplest model includes GMAT, UGPA, and School as independent variables. Subsequent models incorporate the broader range of aforementioned dummy variables. GMAT scores were divided by ten prior to estimation of the regression model. Since GMAT scores change only in units of ten, this aids in interpreting the regression coefficients.

Several patterns emerge in all three models. First, the student's GMAT score, while consistently positive, was not statistically significant at the 5% threshold in any model. However, it is significant at the 10% level in Model 1. The coefficient values for GMAT score indicate that the effect of the score on program success is very small. In Model 1 an increase in GMAT score of ten points is associated with an increase in EMBA GPA of only six one-thousandths of a point. Consistent across all model specifications, the coefficient on undergraduate GPA is always positive and statistically significant at least at the 10% level; in Model 3 UGPA is statistically significant at the 5% level. Student age, race, and gender are not statistically significant in any model. Model 3, which includes the variable Dropout, has a relatively high adjusted R<sup>2</sup> value of 41.7%, which is much higher than the other models.

The variable for School was always significant at the 1% level and always negative. Since it was coded as a one for the research intensive university, it indicates that grades were lower for the EMBA students in that program. The magnitude of the coefficient indicates that the MBA GPA differential is in the range of two-tenths to three-tenths of a grade point; thus a student with a 3.5 GPA in one program might be expected to have a 3.75 GPA in the other. This has a number of possible interpretations. It may be that the grading standards in the program at the research-intensive university are more difficult. It may also be that the professors at the teaching-focused university are better and more caring instructors, who spend more of their time focused on teaching and whose students comprehend the material better. It may be that the admissions processes at

**Table 2.** Regression results

	Model 1	Model 2	Model 3
Constant	3.065*** (9.027)	3.153** (7.649)	3.464*** (10.457)
UGPA	.151* (1.680)	.152* (1.676)	.146** (2.036)
GMAT	.006* (1.672)	.006 (1.648)	.004 (1.302)
School	-.238*** (2.701)	-.237*** (2.671)	-.307*** (4.038)
Age	---	-.002 (-.377)	-.003 (-.672)
Gender (Female=1)	---	---	-.056 (-.619)
Race (non-white=1)	---	---	.043 (.446)
Dropout (dropped out=1)	---	---	-.940*** (-9.068)
F statistic	3.744**	2.825**	14.797***
Adjusted R <sup>2</sup>	5.7%	5.1%	41.7%

Note: \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% levels, respectively. T-statistics are shown in parentheses below coefficients.

one school led to the development of several student cohorts that performed at a higher level than those at the other school. Perhaps the answer lies in some mix of these alternatives. In the absence of a common set of examinations, it is difficult to determine the answer with any degree of certainty.

Additional models adding the squares of the independent variables were also investigated. In all three of these additional model specifications, UGPA remained positive and significant, while GMAT remained positive but not statistically significant. In all models tested, both with and without squared values, the Dropout dummy variable was negative and statistically significant, while Age, Gender, and Race were not significant.

## Conclusions

Results from this study suggest that undergraduate GPAs are a stronger predictor of academic success in these Executive MBA programs than are GMAT scores or other variables, including age, race, or gender. Thus, the human capital elements indicated by success in an undergraduate degree program appear to be the strongest predictor of graduate business school success, even for students who, on average, completed their undergraduate degrees more than fifteen years earlier. It is also apparent that there are significant differences in grade outcomes across different schools.

It is possible that other screening processes typically used for admission into Executive MBA programs produce students who are well prepared for success in these programs. Written statements from the applicants and their employers, demonstrated career achievements and advancement, letters of recommendation, personal interviews, and applicant résumés may adequately capture the requirements for success in EMBA programs, so there may not be much additional information that could be gleaned from a GMAT score. As noted, workload and time management skills are critical aspects of success and completion for these programs, and these skills are not the ones best measured by the GMAT.

Additionally, there may be sizeable differences in Executive MBA and traditional MBA program curricula. For instance, EMBA programs are often more heavily case-based and may thus draw less on the traditional academic skills measured in the GMAT and more on the quality of past business experience, thus utilizing the gains in judgment that hopefully accrue through experience and other factors that lead to success in a business career. Finally, given the significant individual investment in time and monetary costs to pursue the degree, EMBA students may self-select into a cohort that is more motivated, more committed, and more strategically focused. Clearly, individual students have better information concerning their own internal levels of motivation and dedication than any standardized test can reveal. All of these factors may reduce the value of the GMAT score as an indicator of academic success in Executive MBA programs.

There are limitations to this study that indicate the need for further research into the relationship between success in Executive MBA programs and typical admission requirements. First, the data sample remains small, and additional observations across a wider variety of universities and colleges would increase the robustness of these conclusions. Second, the dependent variable is grade point average in the EMBA program. This variable may be a weak indicator of performance if grade inflation or very tight grade distributions reduce the range of this variable, or if students are not as focused on grades as they are on networking. An alternative measure of performance is successful completion of the degree program; given the small numbers of students who dropped out in the data used in this study, and the partly random shocks which seemed to lead to their dropping out, this was not something we could predict with any degree of statistical success. But

it is an area of obvious concern for admissions professionals. Third, different EMBA programs may have different strategic and curricular foci. For instance, specialty programs aimed at engineers, health care providers, real estate development professionals, or other specialty programs may show the GMAT to have differential predictive ability than in the general EMBA programs examined here. Further investigations could provide additional insights and suggestions for a broad range of Executive MBA program admission processes and perhaps identify other indicators of success that lead to better admissions decisions and, hopefully, better outcomes.

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