

Explaining performance in an Executive MBA

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Abstract

The search for characteristics that predict student success is vital as MBA and executive MBA (EMBA) staff seek to attract new entrants. Using data from the University of Paisley's EMBA over 1999-2005, the model developed and tested here synthesises rational choice theory and the student integration model (SIM), in conjunction with critiques of student learning. Information gleaned from student application forms indicated intentions of: integrating academically; integrating socially via networking; career progression; and, obtaining a qualification. Students seeking academic integration performed better (judged by higher graduate GPAs) than students giving other reasons. Students giving networking as a reason for applying had slightly lower graduate GPAs.

In the synthesised model, work experience should affect learning in graduate school. An alternative to the usual measure of experience used extensively in the literature was used. Breadth of experience along with sector of employment at the time of entry yielded significant effects for the experience measure in its own right and in its interaction with sector of employment. It is to be hoped the findings in the current paper will stimulate further research into the linkages between graduate GPA, positions held and competencies, roles and tasks exercised in them.

Keywords: executive MBA; academic integration; social integration; work experience

Introduction

Over the years, a number of attempts have been made to predict performance in post-experience graduate programmes in management and business. Much of this research has concentrated on MBAs running in the US and the UK. Notably, one paper (Arnold *et al.*, 1996) undertook this task for participants in an executive MBA (EMBA) programme.

A concern among researchers is to provide admissions staff with a broad range of performance predictors that might be used to assess candidates. In this vein, Naik and Ragothaman (2004) note that when enrolment prospects are 'bleak', admission criteria are re-examined 'carefully'. Moreover, Danko and Anderson (2005: 28) see the duties of business schools as: recognising "true talent, potential, and character in the students", recruiting "from every rung on the socioeconomic ladder" and meeting the demands of corporate recruiters for "a diverse pool of talented graduates with character and integrity".

These considerations suggest increased pertinence for a study of determinants of performance based on entry characteristics. A key point is that those who do not qualify on the basis of 'traditional' indicators, such as Graduate Management Admission Test (GMAT) or undergraduate grade point average (GPA), might nevertheless perform well in an MBA or EMBA as a result of accumulating life- and work experience. Evaluating the quality of such experience and how it might translate into performance is often subjective. Simply measuring work experience as years since degree study reveals very little about experience of management (Dreher and Ryan, 2004). It may be that many programmes are delivered to people who lack the managerial experience that might underpin their reflection on learning, which in turn might underpin reflection on their management practice (Pfeffer and Fong, 2002; Mintzberg, 2004).

In the research reported in this paper three quantitative contributions are made. The first is to assess experience, not in terms of length or elapsed years but in terms of its breadth, and where it was gained. In

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doing so it attempts to address the deficiency that length measures reveal little about dealing with the complexities of management.

The second quantitative contribution is to use the reasons students give for applying for admission as predictors of academic performance. The motivation for including these derives from Pfeffer and Fong (2002; 2004), who suggest that graduate students have little reason to excel academically. Partly this arises because business practice and graduate-school teaching are tenuously linked, while academic grade and external measures of success, such as career progression and salary growth, are at best weakly connected. Using data on EMBA students at the University of Paisley in the UK, it was possible to investigate whether reasons other than external success would advance the understanding of academic performance.

The final empirical contribution is to add an EMBA study to the literature. Relatively little has been published on EMBA students, “even though executive education is an increasingly large proportion of teaching at some schools” (Pfeffer and Fong, 2002: 80). The group of students who graduated from the Paisley EMBA is of particular interest because they came to the programme with a diverse range of previous qualifications. Many did not have degrees; some had no formal educational involvement after high school. They, however, had at least three years of experience at middle management and many had a lot more.

To provide a framework in which to consider empirical contributions and critiques of graduate students, the ‘synthesised theory’ of Beekhoven *et al.* (2002) is applied. It is a synthesis of rational-choice theory with the theory of educational integration. In this article, recent contributions are set in the context of the synthesised theory and hypotheses about predictors of graduate performance are set out. Multiple regressions are used to test the hypotheses.

Literature Review

Predicting the performance of entrants to MBAs and EMBA students is important as graduate schools seek to improve pass rates, while maintaining the integrity of delivery and assessment standards. It is therefore necessary for admissions staff to be aware of factors that are robust reliable predictors of success. In the absence of complete information as to what actually predicts performance, admissions tutors use traditional criteria, such as having an undergraduate degree. Concentration on these criteria may exclude applicants who innately have the potential to succeed.

Many variables have been used to predict performance, including work experience, entry qualifications, Graduate Management Aptitude Test (GMAT) scores, gender, age, marital status and language proficiency. Starting with the most significant, previous researchers have identified a strong positive link between GMAT scores and the graduate GPA (Arnold *et al.*, 1996; Peiperl and Trevelyan, 1997; Adams and Hancock, 2000; Braunstein, 2002).

Previous studies of the effect of undergraduate GPA on graduate performance have consistently found a positive relationship (Paolillo, 1982; Carver and King, 1994; Arnold *et al.*, 1996; Adams and Hancock, 2000; Braunstein, 2002). Braunstein (2002) and Adams and Hancock (2000) examined the effects of students’ first degrees being in business rather than other disciplines and also whether students completed an MBA at the same institution as their undergraduate degree. They concluded that students with a business degree performed marginally worse than those with a degree in a different area. Braunstein (2002) found that having a degree from the same institution did not affect performance, while Adams and Hancock (2000) found that students who did their undergraduate degree at a different institution performed better than those who did it at the same institution.

Dreher and Ryan (2004: 90-91) summarised research on work experience as follows:

Currently, no consistent body of empirical evidence supports the use of the work experience selection standard ... The question is not so much “does previous work experience have an impact on graduate school and career success”, as “how” or “under what circumstances” does it impact on such success.

As examples of inconsistency, years of work experience did not affect performance in Peiperl and Trevelyan’s study (1997); however for Adams and Hancock (2000) the number of years between completing an undergraduate degree and entry to an MBA explained graduate GPA better than GMAT or undergraduate GPA.

The literature on demographic factors is extensive. First, consider *gender*. Over 25 years researchers have not detected a gender effect (Paolillo, 1982; Graham, 1991; Peiperl and Trevelyan, 1997). Moreover, evidence from Adams and Hancock (2000) and Braunstein (2002) suggests that undergraduate GPA and the composition of work experience are what differ between men and women, rather than performance in an MBA. Further, Braunstein (2002) and Hancock (1999) present evidence that suggests females did less well than males on the GMAT but performed equally well or better on the graduate GPA.

On the relationship between *age* and performance, early studies (Paolillo, 1982; Graham, 1991) found that age did not explain performance. In 2000, Adams and Hancock reached the same conclusion. However, Peiperl and Trevelyan (1997) concluded that student performance in an MBA declined with age.

Paolillo (1982) and Graham (1991) found that *marital status* was not significantly correlated with performance whereas Peiperl and Trevelyan (1997) concluded that married students do better than unmarried students. They offer the tentative explanation that support of a financial, household and emotional nature may help lift the burden from married students, especially those involved in full-time MBA studies. A further factor was that 75% of the sample consisted of overseas students, who Peiperl and Trevelyan suggested may benefit more from such support than home students.

For three classes of EMBA students, Arnold *et al.* (1996) considered the importance of subjective factors such as *motivation to succeed*, measured from personal interviews, resume evaluation, letters of recommendation, prior track record and level of financial support offered by the applicant's employer. They found these factors added to the predictive power of models that included GMAT and undergraduate GPA.

In recent times, a number of academics have questioned research and teaching in business schools (Pfeffer and Fong, 2002; 2004; Mintzberg, 2004; Ghoshal, 2005; Bennis and O'Toole, 2005). Doubts were raised by Pfeffer and Fong (2002: 83) about what is learnt:

...almost no one fails out of MBA programs, which means the credential does not serve as a screen or an enforcement of minimum competency standards.

They later state that:

In today's prestigious business schools, students have to demonstrate competence to get in, but not to get out (p83).

A reason for this may be that:

business schools have developed elaborate and expensive grading systems to ensure that even the least competent and least interested get credit (Armstrong 1995: 104).

Pfeffer and Fong (2002) suggest other reasons for participants having little interest in academic excellence. These include:

- uncertain links between academic performances and salary or career progression;
- a proportion of applicants using the experience primarily to build networks;
- students recognising that the curriculum is not always relevant to learning how to manage; and
- that teaching methods are not appropriate to gaining the experience required to manage effectively.

The theory synthesised by Beekhoven *et al.* (2002) is used below as a means of understanding academic outcomes among graduate students. This framework, referred to as the 'synthesised theory', is discussed next.

Integration and rational choice

Beekhoven *et al.* (2002: 581) emphasised student integration and rational choice in stating that:

Students trying to integrate into the student community are likely to be rational actors who make cost benefit analyses.

From rational-choice theory they extracted the notion of cost-benefit analyses being made within the milieu in which individuals operate. In the current context, if a rational student believes graduate programme content is unrelated to career prospects, the opportunity cost of time devoted to learning is high, and if the milieu is such that few fail, then he or she would reduce time devoted to learning activities.

Student integration is central to the theories of Tinto (1975; 1993; 1997), in which the inter-related notions of academic and social integration influence whether students persist with undergraduate study. The theory is dynamic in that first, students arrive at forms of academic and social integration; and second, from these they decide whether or not to continue their studies. In this paper interest lies in the first phase only, as the students under study had completed the EMBA qualification. Academic and social integration are influenced by a number of factors, including: student demographic characteristics such as age and gender; previous educational outcomes and experience that reflect actual ability or students' perceptions of their capacities to complete a degree; commitment to the goal of attaining a qualification in a discipline; and commitment to the university where study is undertaken.

Although originally devised to explain attrition among traditional undergraduates who commence university study as soon as possible after completing high school, the student integration model (SIM) has been applied to doctoral students (Lovitts, 2000) and to non-traditional adult undergraduates studying management (Ashar and Skenes, 1993; Houston and Rimmer, 2005).

Social integration is seen as participation in extracurricular activities and informal, casual interactions with peers and staff (Lovitts, 2000; Beekhoven *et al.*, 2002). Academic integration involves an objective component measured by grades obtained or GPA. The subjective component concerns students' perceptions of intellectual development. Both forms of academic integration are affected by formal interactions with students and staff and are influenced by commitments to an institution and a discipline. Despite pessimism about learning in MBAs, examination of graduate GPA is consistent with the approach of Pfeffer and Fong (2002: 83):

If the credential could potentially mean nothing in terms of mastery of the subject matter, then we need to examine ... measures of knowledge acquired. Although grades are not a perfect measure of subject matter mastery, they have the advantage of being available in some studies and, moreover, are likely to be at least somewhat related to how much one has learned in courses.

If, on the basis of a cost-benefit analysis, enrolled students do not seek objective academic integration, then they rely on subjective academic integration and/or social integration. On social integration, Pfeffer and Fong (2002: 82) reiterate the conclusion of Crainer and Dearlove (1999: xix):

This is what happens in business schools. Most students simply get drunk. MBA students bond and network.

Overall, students undertake cost-benefit analyses and are expected in recent critiques to decide that social and subjective academic integration are the rational courses of action. In the quantitative studies reviewed above, predictors of academic integration fell into four categories:

- (i) entry qualifications;
- (ii) work experience;
- (iii) subjective factors; and
- (iv) demographic characteristics.

Each has a role in the synthesised theory and in the next section hypotheses are formed.

Hypotheses

The characteristics available to Paisley EMBA graduates when they applied for admission to the programme included reasons for applying, previous qualifications, the number of different employers, sector of employment, age, gender and marital status. The data are summarised in the next section.

Degree status

Students applying for Paisley's EMBA did not complete the GMAT. However, data were available on qualifications previously obtained. In the context of entering graduate school, the synthesised theory suggests that possession of a degree reflects actual abilities or the holders' subjective views of their abilities to successfully complete a graduate award (Beekhoven *et al.*, 2002). Hence in the synthesised theory, graduate GPA will be improved for those who have an undergraduate degree. Thus the first hypothesis is: **H1**: The possession of an undergraduate degree will predict EMBA performance.

Recall that students with a non-business degree tended to do marginally better than those with a business degree; while evidence on the performance of those with a degree from a university other than the host university is mixed (Adams and Hancock, 2000; Braunstein, 2002). Two additional hypotheses are formed:

H1A: Having an undergraduate business degree will predict EMBA performance.

H1B: An undergraduate degree from the host institution will predict EMBA performance.

H1A is underpinned by integration into a discipline prior to enrolling in graduate school, while H1B is underpinned by integration via commitment to an institution.

Work experience

The evidence on the relationship between measures of work experience and performance is inconsistent. In the current research, work experience is measured by the number of different employers recorded on application forms. As such it indicates aspects of breadth or variety of work experience, in contrast to the usual measures that use length or numbers of years of experience.

In choosing a breadth measure an attempt is made to build on Dreher and Ryan's (2004: 91) observation that:

Simply holding a post-undergraduate job for five years guarantees very little about candidates' exposure to the complexities of managing or leading a business.

While having a single employer may involve a wide variety of experiences, it is assumed that variety rises with number of employers. In the context of the synthesised theory, breadth is an entry characteristic. It is assumed to enhance actual managerial ability and/or applicants' views of their chances of succeeding. Moreover, it is likely that experience measured in this way reflects commitment to management as the preferred area of activity. If this form of experience is a required underpinning for reflection on what is taught, then:

H2: Breadth of work experience will predict EMBA performance.

Another aspect of experience is where it was gained. Recent experience could be measured for EMBA applicants in terms of sector of employment - public or private. However, a priori many factors might be conflated in a sector variable. These include the benefits of more consideration given to employee study in the public sector or greater contact with a range of approaches to business that could have beneficial effects in the private sector. The first of these reasons would be negated if students realise that social and subjective academic integration are what matter. However, in the UK there is a drive to induce the public sector to be more like the private sector in its approaches, processes and delivery of services. Such extensive change (Donnelly *et al.*, 2006) may foster among public officials the desire for academic integration into the practice of modern management. Thus it is hypothesised that:

H3: Current sector of employment will predict EMBA performance.

Reasons for applying

Subjective assessments by admissions staff of candidates' likelihoods of success were considered by Arnold *et al.* (1996). If it is accepted that admissions staff 'know' what is required to succeed and this can be discerned, then as Arnold *et al.* found, subjective assessments would add to the explanatory power of predictive models. This might be the case, especially where factors such as professors' assessments of class participation form a substantial part of grades (Mintzberg, 2004).

Given the observations of Pfeffer and Fong (2002), no matter what reasons students gave at the time of applying for admission, they would react rationally to the milieu in which they are pursuing graduate study, and rely on social integration and subjective features of academic integration. Thus academically related reasons, such as learning new skills, will be supplanted by the realisation that obtaining the award depends on social- and subjective academic factors. This suggests that:

H4A: Reasons associated with objective academic integration will *not* predict EMBA performance.

Extracurricular activities associated with social integration were anticipated by Pfeffer and Fong (2002) to involve networking in the form of 'bonding' and 'getting drunk'. Tinto (1975), the formulator of integration theory, recognised that excessive social integration is not compatible with integrating academically. Hence, if extracurricular activities detract from learning, then the synthesised theory predicts:

H4B: Reasons associated with social integration will *not* predict EMBA performance.

Demographic characteristics

In the SIM, demographic factors affect academic and social integration. For EMBA graduates from University of Paisley, age, gender and marital status were known.

Age is often correlated with experience, where the latter is measured frequently as the amount of time spent in work, either since leaving school or leaving university. The measure of experience in the current study is breadth, measured by the number of employers. Even so, among older EMBA students, there is a chance that the number of employers will exceed the number for younger participants. This means that estimations for academic performance involving age and breadth of experience might be affected by multicollinearity.

With this in mind, effects associated with age and experience may be masked in the estimations. Consequently, estimations were run using each separately as well as jointly, and the Akaike Information Criterion (AIC) was used to decide which to prefer (Gujarati, 2003). Further, both age and breadth of experience were tried in interaction with sector (see later). Again, on the basis of the AIC, the interaction involving experience was preferred over the interaction involving age.

There are other considerations relating to age. Although variation across age groups can be high (Collis, 2000), there is little variation in intelligence and cognitive ability with age and it is usually irrelevant before the age of 65 (*ibid.*; Berger, 1998). In this study, entrants to the Paisley EMBA were no older than 53 (even though there is no discrimination on the basis of age in deciding admissions), so the erosion of cognitive abilities should be irrelevant in this study. The findings on cognitive abilities were assessed in laboratory studies focused on maximum intellectual outcomes in complex activities and in situations where response

speed is important (Warr, 1994). Closed-book, time-constrained examinations used in nine of the 12 modules of the Paisley EMBA meet these criteria. However, assessment in each also involved at least one piece of coursework and frequently involved two or more.

There are positive cognitive benefits, as social skills and strategic thinking tend to improve with age (Collis *et al.*, 2000), providing these have been fostered by experience (Warr, 1994). Such meta-cognitive abilities might be especially beneficial to students in an EMBA programme and might be fostered as participants moved from job to job accumulating experiential breadth. Consequently, it seems effects that might otherwise be associated with age, actually work through experience.

The quantitative findings on gender discussed earlier are consistent with men and women having the same approaches to assessing costs and benefits and arriving at preferred forms of integration across graduate schools.

Peiperl and Trevelyan (1997) suggested that marital status may be important where there are large numbers of foreign nationals in graduate-school classes. In terms of the synthesised theory this can be seen as highlighting roles for two pre-defined background characteristics (marital status and residency before enrolling) in arriving at academic and social integration. As most EMBA entrants at Paisley were married and all were permanently resident in the UK before applying, it is expected that marital status will not affect graduate GPA. Thus, on balance, in the current study it is expected that:

H5: The demographic factors of age, gender and marital status will not predict EMBA performance.

Results

For each of the 108 graduates of the Paisley EMBA programme between 2001 and 2005, marks (out of 100) and grades for each module were available. These were converted to a 'graduate GPA', weighting for module credit (which equates with credit hours). The average value of graduate GPA was 3.1 and the standard deviation was 0.2. That is, this indicator of academic integration is tightly distributed about its average. Data on entry characteristics used in regressions to test the hypotheses above were obtained from application forms. Though the data derived in this way cover the population of all graduates, there were instances of missing items that are noted in Table 1.

The average age of students on the Paisley EMBA is 37.2 years, which is slightly higher than the average of 35.9 across 269 EMBA programmes (EMBA Council, 2005). At nearly 39%, the percentage of females is relatively high. Across all EMBA Council members, the percentage of females is 27%, while for European schools alone it is 22%. In the Paisley sample almost 80% were married.

Fewer than half of entrants (48.6%) were educated to degree level. Emphasis is placed on work experience and experiential learning, and these are considered to be as important as formal educational achievement. This is in line with open-access policies at Paisley that underpin its reputation for value added (Goddard, 2003). Less than 8% of entrants had a business degree (many had degrees in science, engineering, social science or IT), while 12% had a degree from Paisley. For those without a degree, vocational qualifications were the norm.

Breadth of work experience is measured by number of employers, which varied considerably for Paisley entrants: 22% had a single employer while 25% had four or more employers. Nearly three quarters of the EMBA entrants hailed from the private sector - mainly logistics, manufacturing, ICT, engineering and construction. Those in public service had been employed in health, education, policing and local government.

When applying for admission, entrants were asked to write about why they wished to do an EMBA. Nine reasons were identified and the proportions reporting each are shown in Table 2. Approximately 90% gave one to four reasons; the remainder gave none. From the list in Table 2, 'broaden skills or knowledge' and 'apply new learning to work' were identified as providing opportunities to test H4A on objective academic integration. Also, wishing to 'interact with others from different backgrounds' was taken to be a facet of networking and social integration and is used to test Hypothesis H4B.

The written statements in application forms, from which reasons for wishing to study the EMBA were extracted, were only read by the programme director and his deputy. They are two of 16 teaching staff. It might be argued that in scanning the statements, self-fulfilling selections for success were made. However, having sight of written statements would be unlikely to prejudice grading of coursework and closed-book examinations by the other fourteen staff. In any case assessments are double and anonymously marked which should also reduce the effect of subjectivity associated with professorial inputs to assessment (Mintzberg, 2004).

	Percent	Number
Female	38.9	108
Married	79.0	105
Age on application (years)		108
24 - 32	25.0	
33 - 37	25.0	
38 - 43	25.0	
44 - 53	25.0	
Average		37.2 years
Standard deviation		7.0 years
Entry qualification		105
Degree	48.6	
in business	7.6	
from Paisley	12.4	
Work experience		105
less than 5 years	11.4	
6 - 10 years	12.4	
11 - 20 years	41.0	
more than 20 years	35.2	
Sector		
Private	73.0	107
Public	23.0	107
Number of employers		101
1	21.8	
2 or 3	53.4	
4 or more	24.8	
Average		2.7 employers
Standard deviation		1.5 employers
Number of reasons given		108
0	10.2	
1	31.5	
2	40.7	
3	14.8	
4	2.8	
Average		1.8 reasons
Standart deviation		0.9 reasons

Table 1: Descriptive statistics for participants in the Executive MBA at the University of Paisley

	Reason	Percent giving reason
1	To obtain promotion or enhance career development	55.6
2	To broaden skills or knowledge	44.4
3	To obtain a qualification	27.8
4	To interact with others from different backgrounds	15.7
5	To improve self worth or for self development	13.9
6	To apply new learning to work	11.1
7	To make more effective in current position	4.6
8	Taking over a family business	1.9
9	To get business to perform better	1.9

Table 2: Reasons for studying an Executive MBA

The results of regressing graduate GPA on a range of variables are shown in Table 3. Coefficients and t-statistics (in parentheses) are shown with significance levels at 10%, 5% and 1% or better indicated by *, ** and *** respectively. Adjusted R^2 , F and AIC (Akaike Information Criterion) are provided as indicators of model

performance. Dummy variables shown in Table 3 were:

- Has degree (coded as one if the entrant had a degree; zero if not)
- Gender (one if female; zero if male)
- Married (one if married; zero if not married)
- Sector (one if in the private sector; zero if in the public sector)
- Broaden skills (one if a graduate gave broaden skills or knowledge as a reason for applying; zero if not)
- Apply learning to work (one if a graduate gave apply new learning to work as a reason for applying; zero if not)
- Networking (one if a graduate gave interact with others from different backgrounds as a reason for applying; zero if not).

	1	2	3	4	5	6
Has degree	0.078	0.078	0.081	0.071	0.078	0.076
	(1.88)*	(1.86)*	(1.93)*	(1.78)*	(1.87)*	(1.67)*
Number of employers		0.024	0.049	0.046	0.052	0.046
		(1.62)*	(2.96)***	(2.86)***	(3.10)***	(2.65)***
Sector		-1.114				
		(-2.42)**				
Sector x no. of employers			-0.033	-0.034	-0.038	-0.033
			(-2.34)**	(-2.52)**	(-2.57)**	(-2.28)**
Broaden skills				0.093		0.091
				(2.29)**		(2.18)**
Apply learning to work				0.15		0.16
				(2.50)**		(2.54)**
Networking					-0.11	
					(-1.13)	
Age						-0.0026
						(-0.78)
Gender						0.032
						(0.67)
Married						0.10
						(1.85)*
Constant	3.04	3.06	2.96	2.92	2.98	2.92
	(104.62)***	(45.75)***	(56.97)***	(56.65)***	(56.67)**	(21.14)***
R ²	0.033	0.118	0.115	0.215	0.127	0.245
Effect size for R ²	0.034	0.134	0.130	0.274	0.145	0.325
Adjusted R ²	0.024	0.091	0.088	0.173	0.090	0.176
F statistic	3.54*	4.21***	4.17***	5.16***	3.45**	3.57***
AIC	-0.232	-.0287	-0.284	-0.364	-0.277	-0.311
Number	105	100	100	100	100	96

Table 3: Estimates of graduate GPA in the Executive MBA at the University of Paisley

Six models are reported. The regressions in columns 1 to 5 of Table 3 include only variables associated with entry qualification, number of employers, sector of employment and reasons for applying. In column 6, age, gender and marital status are added. Each of the hypotheses set out above are examined in light of this evidence.

The influences of an undergraduate degree

Hypothesis H1 has support, as the coefficient of the dummy for possession of a degree is positive and significant at 10% or better, but not 5% or better as is conventional, across the columns of Table 3.

Hypotheses H1A and H1B were tested using additional regressions (not shown in Table 3), in which the dummies for having a business degree and having obtained a degree from Paisley were included, both with and without the overall degree dummy. In each of the additional regressions the two variables did not return coefficients that were significantly different from zero, even at the 10% level, suggesting no support for H1A and H1B.

Breadth of experience and sector of employment

Hypotheses 2 and 3 are supported in the estimations. An *F*-test for the joint inclusion of the breadth and sectoral variables was significant at better than 1%, indicating that they usefully add to the explanation of graduate GPA provided by possession of a degree (Greene, 2003). In column 2, graduate GPA is estimated to increase as experiential breadth increases, while applicants from the private sector are estimated to do worse on average. Note, however, that the breadth coefficient is significant at 10% or better. To allow for possible interaction, sector was dropped in column 3 and in its place the variable formed as the product of number of employers and sector of employment was included. Further, all three of employer number, sector and their interactions, as well as other sub-combinations of them were tried. The AIC was similar in columns 2 and 3. However, the pair in column 3 (*number of employers and sector x number of employers*) was preferred as they generated smaller AIC values in combination with the additional variables in columns 4 and 6 than did the pair of experience-related variables included in column 2.

The effects of the number of employers and the interaction with sector can be seen as follows. Consider two applicants who had the same values for the variables in column 3, except that at the time they applied one of them worked in the private sector and the other was employed in the public sector. Suppose that they had each worked for two employers. For the private-sector applicant the value of the sector dummy is one and the effect on graduate GPA is:

$$0.049 \times 2 - 0.033 \times 1 = 0.098 - 0.033 = 0.065.$$

For the public-sector applicant the influence is:

$$0.049 \times 2 = 0.098$$

That is, the public-sector applicant is estimated to perform better. The difference in graduate GPA is 0.033. At the average value of graduate GPA (3.1), this corresponds to a difference in score of about 1%. While relatively slight, the difference arises from the coefficient of the interaction term that is significant in column 3 at better than 5%.

Reasons for completing an EMBA

Dummy variables were added next for the reasons *broaden skills or knowledge* and *apply new learning to work*. In columns 4 and 6, they have positive effects on graduate GPA that are significant at better than 5%. Thus, Hypothesis H4A is rejected. In column 4, the two reasons improve graduate GPA by 0.093 and 0.15 or increases of 3.0% and 4.8% in GPA at its average value of 3.1. An *F* test (details not shown) provided no support for one having a greater effect than the other.

In column 5, the model of column 3 is extended by adding the *networking* reason for applying to do the EMBA. Its coefficient is not significant at even 10%. Also, the AIC at the foot of Table 3 is larger, suggesting that the model of graduate GPA should not include this reason.

The coefficient of the networking variable is negative. To explore this further, two subsidiary regressions were run that are not reported in Table 3: (i) six dummy variables were added to the predictors in column 3 for the most popular reasons in Table 2; and (ii) dummies were added for the three reasons from the six most popular other than networking, broadening skills and applying new learning to work. These regressions confirmed that the networking coefficient was the only one to be negative and it again failed to be significant at 10% or better. The reasons added in the second subsidiary regression were *career development*, *obtain a qualification* and *improve self worth or for self development*. Each coefficient was positive; none was significant at 10% or better.

Demographic factors

In column 6 of Table 3, the influences of three background variables are included. The only background factor to have a significant effect was *marital status*, but at only 10% or better. The positive coefficient suggests that being married is associated with improved graduate GPA. Of the remaining background variables, *gender* is associated with an insignificant benefit for women; while with age there is an insignificant downward drift in performance with increasing age. Finding significance for marital status at 10% or better suggests that H5 should not be accepted. However, the regression with the demographic variables has a larger value for AIC than does the regression in column 4 that excludes them. That is, demographic variables add little to the explanation of graduate GPA.

Nevertheless, the result in Table 3 on marital status echoes the finding of Peiperl and Trevelyan (1997), even though the effect may be weak. Often at graduation ceremonies wives or husbands remarked that absences of two years from full family involvement were bearable while their spouses did an EMBA. This would suggest that married EMBA students enjoy relationships that particularly facilitate their concentration on the award. On the other hand, some students' marriages ended while they were doing an EMBA, perhaps explaining the weakness of the effects observed by Peiperl and Trevelyan; and in this study. While echoing Peiperl and Trevelyan's results, the findings at Paisley arose for cohorts that did not include overseas students.

Cohort effects

At the suggestion of the editor, the data were examined to check whether the results in Table 3 might be driven by cohorts of students having unusually high or low graduate GPAs. To do this an analysis of variance was conducted. This showed that there was little evidence of cohorts doing well or badly relative to the others, with the one exception of a relatively small cohort containing the student with the highest graduate GPA. This student (and also every other student included in the study) did not emerge as an extreme- or influential observation of GPA in two forms of outlier analysis: checking for observed GPAs that were greater than 1.5 times the interquartile range below the first quartile or above the third quartile; and looking for regression residuals that were more than three standard deviations from the mean (Gujarati, 2003).

However, dropping the highest GPA eliminated differences between cohort means and so the estimations were run again with this student removed. As another test, the estimations were repeated with the student's entire cohort removed. In each case, results were little changed and the preferred estimation contained only the variables included in column 4 of Table 3. Given this and given the evidence that no observations could be considered to be outliers; the cohort was retained, including the observation of greatest GPA.

Sample size, significance, power and precision

It might be argued that the sample size in the current study is too small. There are two reasons that weaken this argument. First, significant effects were detected, in the case of *number of employers* at better than 1% and in the cases of the *interaction of sector with number of employers*, *broaden skills* and *apply new learning to work* at better than 5%, the conventional level at which significance is sought for samples of modest size. In fact, when sample sizes are large, 1% or 0.1% are used often as the appropriate benchmarks for significance. This is because the denominator in a test statistic (the standard error) can become small as sample size increases, so that the test statistic becomes large.

Consequently, sample size may drive the conclusion that a coefficient is significant, independent of any actual relationship between a dependent and an independent variable. Ghauri and Ghrønburg (2002: 135) put this in the following terms: "Significance tests are often most interesting when the sample size is small or moderate". Thus, on the basis of a sample of 100, there is research interest in the preferred estimation of Table 3. Recall that significance assesses the likelihood of rejecting a null hypothesis. It relates to the probability of rejection when in fact the null is true. In the case of four variables in Column 4 of Table 3 this is 5% or less. Thus, for example, there is evidence that with a small risk (5% or less) of drawing the wrong conclusion, groups of student giving one or both reasons in column 4 attain higher graduate GPAs on average than students who did not.

The second reason for not dismissing the results because of concerns about sample size relates to *power* - *the probability of correctly rejecting a null hypothesis when it is in fact false*. For the variables in column 4, a post-hoc calculation, performed using the formula described in Polit and Beck (2003), yields power of 0.987 if the significance of the attained R^2 is taken as better than 5%. Power is 0.945 if the significance of R^2 is taken to be 1% (which the F-statistic in Column 4 supports). These probabilities are high, compared to the conventional value of 0.800 for power. Further, the power inherent in the addition of the reasons variables between Columns 2 and 4 is 0.887, again greater than the conventional value. For the introduction of experience variables (the change from columns 1 to 2) power is 0.793, just less than 0.8.

The reader can check the calculations above using on-line freeware (Soper, 2007) and information given in Table 3. Estimates of sample sizes to sustain studies having conventional significance (0.05) and power (0.80) can also be obtained. The minimum sample for an R^2 of 0.215, corresponding to a 'medium' effect size of 0.27 (Polit and Beck, 2003), is 53. A sample of 91 students would be required to detect the smallest medium effect size of 0.15 (Cohen, 1992) with the number of variables included in column 4.

Our sample of 100 also conforms to a number of rules for adequacy in regression. A widely applied rule of thumb is that there should be about 10 observations per variable, including the intercept. The estimations in each column conform to this rule. In the case of column 6, which has nine variables (including the intercept), 90 cases would be required. Green (1991) dismisses the rule of thumb and recommends sample size should be at least 50 plus eight times the number of predictors to ensure power of 0.80. Column 4 satisfies this criterion, but Column 6 does not. Elimination of variables that are not significant at better than 10% in column 6, would give a system requiring $50 + 8 \times 6 = 98$ observations. This is two more observations than the 96 available.

The sample of 100 further exceeds the size required to ensure that a hypothesis test can be conducted for an individual coefficient (van Belle, 2002; Hsieh *et al.*, 1998). Because the calculations involve the R^2 in an auxiliary regression of the predictor to be tested on the other predictors in the graduate GPA estimation, samples sizes for individual-coefficient tests vary. For example, with the conventional values of 0.05 and 0.80 for significance and power, to separately test the null hypotheses that the coefficients of *number of employers* and *to apply learning to work* are zero would require a minimum of 49 and 35 observations each in

the estimation of Column 4.

Thus, while the size of the Paisley sample is smaller than is the case in many other studies (see Table 4, which is discussed in the next section), solid conclusions can be drawn in the senses that: the probability is low (0.05 or less) of rejecting null hypotheses (that coefficients are zero) when the hypotheses are in fact true (the coefficients are in fact zero); and the probability is high that rejected null hypotheses are in fact false. Nevertheless, with a sample of 100 in the preferred estimation, it may be that small effects (effect sizes of 0.02 or less) cannot be detected. This would require a sample of size 643, which is greater than any of the sample sizes in Table 4. As an example, consider the finding that networking does not have a significant effect on graduate GPA. Perhaps a study involving more students would provide support for the existence of a small, but significant coefficient reflecting the strongly worded contention of Pfeffer and Fong (2002:82) quoted earlier.

Another issue associated with sample size is the width of confidence intervals for coefficient estimates and the implied precision. As the width of confidence intervals varies directly with coefficient standard errors, which in turn are likely to become smaller as sample size increases, it follows that narrower interval widths and so more precise estimates of population coefficients are likely to be obtained for greater sample sizes. As an example, the 95% confidence interval for the estimated coefficient of *broaden skills*, spans 0.0124 to 0.173. While the sample estimate lies at the mid-point of these values, the actual or population value for the coefficient could lie anywhere in the interval. Thus, it might be small, being only a little greater than 0.0124; or more than 13 times larger, at slightly less than 0.173. Sample size is taken up again in the ensuing discussion.

Discussion

It was demonstrated in the last section that the sample was sufficiently large to: permit detection of medium effect sizes; have high or acceptable explanatory power; and determine significance of coefficients at 5% or better. However, as also noted in the previous section, the sample of 100 in the *preferred* estimation (on the basis of the Akaike Information Criterion) was not sufficiently large to provide accurate estimates of population coefficients. There is another feature of sample size that affects the judgement of the effectiveness of the current study. To discuss this consider Table 4.

Studies that use either or both of the traditional predictors of undergraduate GPA (UGPA) and GMAT have higher adjusted R^2 . Ahmadi *et al.* (1997) and Adams and Hancock (2000), who used neither pre-entry measure, reported lower adjusted R^2 . (Adjusted R^2 for Adams and Hancock was calculated from their ANOVA results for testing graduate GPA across experience categories and they did not run regressions.)

The adjusted R^2 in the current study is 0.18, exceeding that for one investigation that used both GMAT and UGPA and the studies that used neither. If the R^2 of 0.215 (Table 3) had been obtained with the greater sample size of Peiperl and Trevelyan (1997), adjusted R^2 would have been 0.21, which is close to the larger values in Table 4. The actual adjusted R^2 , and what it might be in a larger sample, suggest that the Paisley study, which included reasons for doing an EMBA and used a different approach to experience measurement, adds to understanding of performance in the University's EMBA. It further suggests that, if available, these or comparable explanators are worthy of exploration at other institutions.

Overall, the findings in the Paisley EMBA study are consistent with earlier studies of age, gender and having a degree, even though the sample was on average older, had a higher representation of women, and had fewer entrants with degrees than is generally the case. These features of the sample might go some way to explaining the emergence of different experience measures (*where degree was gained* and *how many employers*) and the importance of some reasons for doing a graduate business qualification. Other studies have either not looked at these variables (particularly quantitative studies of experience) or have been pessimistic about the possibility that some students are eager to learn in graduate school (as in Pfeffer and Fong's remarks on MBA programmes and students).

For example, if the Paisley sample is older because they had changed job frequently and made transitions between private and public sectors before enrolling in an EMBA, this might explain why number of employers and sector of employment matter. Other researchers might not have used number of employers and sector because they did not display sufficient variation. Alternatively, the variables may not have been available or researchers did not think to explore them.

Another example of difference relates to marital status. Running the regression of Column 6, with age and gender excluded, does not produce a significant effect at even 10% for being married. This suggests that the effect of marriage on graduate GPA is small and may be conditioned by interactions with age and gender. However, to detect such influences much greater sample sizes would be required than in the studies of Table 4.

There are points of comparison between the current study and other research into graduate programmes. First, the current study is of a single institution, as are the studies in Table 4. A reason for the preponderance of single-institution research may be that business schools operate in markets with distinctive demand-side features, so that finding pre-entry factors which correlate with student success is an institution-specific matter. On the other hand, given the spread of assessment standards across business schools that emerges from the activities of external examiners and accrediting bodies or, taking Pfeffer and Fong's point, the desire of schools to assure student success, it is likely the standards underpinning student outcomes in terms of GPAs may be similar across markets. Together, market and student pre-entry diversity and similar outcome standards, suggest there is scope for a larger, multi-institution study that would inform policy and practice relating to graduate business programmes.

A second similarity in Table 4 is that, with the possible exception of Adams and Hancock (2000), student cohorts were pooled to build the samples studied. As noted above, samples of modest size can yield insights. However, as also noted above, pooling did not produce samples of sufficient size in Table 4 to permit identification of small-effect influences on graduate GPA.

	Sample size	Number of predictors	Adjusted R^2	GMAT and/or UGPA
Braunstein (2002)	280	5	0.23	Both
Dreher and Ryan (2000)	230	16	0.14	Both
Arnold et al. (1996)	109	7	0.24	Both
Peiperl and Trevelyan (1997)	362	7	0.24	GMAT
Adams and Hancock (2000)	269	2	0.07	Neither
Ahmadi et al. (1997)	279	2	0.08	Neither
This paper	100	6	0.18	Neither

Table 4: Comparison of explained variation in seven studies since 1996

A comparison of the effects of variables related to experience in studies since 1996 is shown in Table 5. Where a description of the experience variable is not indicated, it is the measure of experience in years. For example, the first correlation shown for Peiperl and Trevelyan (0.03) is that between years of experience and graduate GPA.

The studies are ordered approximately by the vintages of the students in each. For example, the first entry in the table is for a study of three recent EMBA classes. There was no further guidance in Arnold *et al.* on the years in which these classes were enrolled. However, the paper appeared in 1996, so the classes under study were probably enrolled no later than the students in the next study (Dreher and Ryan 2000). Substantial correlations between graduate GPA and experience arose in the studies where most of the students being researched were enrolled after 1995. (One caveat is that the lack of significance in the Peiperl and Trevelyan correlations may be due to collinearity between age and years of experience.)

Overall, from Tables 4 and 5:

- pre-entry qualifications are seen to predict MBA and EMBA performance; and
- for the decade covered in the studies it seems that, over time, increasing correlations arise between experience and graduate GPA.

Having controlled for experience and qualifications held at the time of entry to a graduate programme, reasons for studying for an EMBA were entered into estimations. One interpretation of the finding that a networking reason for applying did not significantly affect academic performance is that networking is an end in itself. Equally, it might be that successful networking and academic integration are incompatible. There is weak (in the sense of being non-significant) support for this, as giving networking as a reason for doing an EMBA had a negative effect on academic performance, while other popular reasons had positive effects.

If students know career development and compensation are only weakly related to academic performance, then this may be another reason for them not concentrating on objective academic integration. In this case, no relationship would be expected between performance and giving a career-related reason for enrolling. This was borne out, as the reason 'to obtain promotion or enhance career prospects' was not significantly related to graduate GPA at Paisley.

So far in this section, the discussion of reasons for applying has concentrated on those that did not have significant effects on graduate GPA. Yet, two reasons for applying for admission to the Paisley EMBA did generate significant effects. These were 'broaden skills or knowledge' (given frequently on application forms, see Table 2) and 'apply new learning to work' (given infrequently). It was hypothesised, using the observations of Pfeffer and Fong (2002) and the synthesised theory, that these reasons would be abandoned

by rational students once they understood the milieu in which they were studying. The finding of positive coefficients, significant at better than 5%, does not bear this out.

	Vintage	Correlations
Arnold et al. (1996)	Three recent EMBA classes	Not available
Drehen and Ryan (2000)	Started MBA in 1994 or 1995	
	<i>Less than 2 years</i>	0.00
	<i>More than 5 years</i>	0.09
Peiperl and Trevelyan (1997)	Two first-year MBA classes	0.03
	<i>Age</i>	-0.08
Ahmadi et al. (1997)	Currently enrolled MBA	
	<i>Age</i>	0.28
Adams and Hancock (2000)	Recent MBA graduates	0.24
Braunstein (2002)	MBA graduates 1997 - 2000	0.16
This paper (2008)	EMBA graduates 2001 - 2005	
	<i>Number of employers</i>	0.17
	<i>Number x sector</i>	-0.11
	<i>Age</i>	0.01

Table 5: Correlations between graduate GPA and experience

It might be contended that the remarks of Pfeffer and Fong (2002) were directed at MBA students rather than those who studied MBAs. However, they reiterated Mintzberg and Gosling's (2002: 28) remark that, "curricula for so-called executive MBA programs, or educational programs for working managers, are organized in much the same fashion" as regular MBA programs. This suggests Pfeffer and Fong felt their criticisms were applicable to EMBA students.

Further, Pfeffer and Fong (2002: 79) suggest that in graduate school teaching is directed "perhaps to the wrong people at the wrong times in their careers" and is delivered in the "wrong ways". This resonates with the contention of Mintzberg (2004: 6) about 'conventional MBAs', by which he meant "full-time programs that take relatively young people, generally in their twenties, and train them in the business functions, out of context - in other words independent of any specific experience in management". In this might lie part of the explanation for the conclusions reached in the current paper on the relationship between observed performance and academic-integration reasons for applying: the Paisley EMBA is aimed at working executives who wish to combine work and study. Lasting two years, it uses blended face-to-face and online modes of study. Compared with conventional MBAs, Paisley students are generally older than the mid-twenties, are employed full time, study part-time and have several years of managerial experience. Did this experience commit them to academic integration?

Perhaps, however, for those in the public sector, academic integration was somewhat more intense. To say more about the roles of specific managerial experiences in fostering academic integration, better data are required on competencies, roles, tasks and positions. This is an area for further research that would allow refinement or replacement of the breadth and sector indicators of experience.

For Pfeffer and Fong (2002) there is a fourth 'wrong' in addition to 'wrong people', 'wrong times' and 'wrong ways', in that the 'wrong things' are taught. It was not possible to address this issue directly with the data to hand. However, as was observed from Table 4, less than 25% of the variation in graduate GPA has been explained in studies over the past decade. This would be consistent with students coming to understand that the wrong things are taught in MBAs and MBAs, so that as the synthesised theory predicts they rely on other ways of emerging at the end of their business studies with a qualification. It is of course also consistent with academic staff who have high standards and mark severely. In the undergraduate context in the UK there is support for this (Yorke, 2002).

In forming hypotheses, the synthesis of rational choice and the SIM was applied. There have been many critics of the student integration approach in particular, including:

those who wish to revise and improve Tinto's theories ... and those who propose entirely new theoretical directions (Zepke and Leach, 2005: 47).

The synthesised theory falls into the former category. It was helpful in discussing recent critiques of taught graduate programmes, because of the roles of academic- and social integration. However, this advantage is

partially offset because the two are not independent (Beekhoven *et al.*, 2002). This opens the possibility of developing new theory for graduate schools of business.

Moreover, there is an aspect of theory testing in the current paper that should be made clear. The research relied on reasons students gave on their application forms. Implicitly, it was assumed that these underpinned actual behaviour during the period of EMBA study. This was borne out in that significant effects on performance were detected. However, if it had been possible to obtain insights from students on their behaviour while they were studying, it is possible that even more of the variation in performance might be explained.

Conclusion

The intention in this paper was to investigate the linkages between student characteristics at the time they entered an EMBA programme and the graduate GPAs they attained. In doing so, reasons for applying and another approach to managerial experience were explored. The quantitative findings were discussed and related to previous research. It was noted that further work on the types of experience applicants bring to programmes may enhance understanding of the role of work experience in learning outcomes.

The findings on EMBA students have similarities with earlier research on MBAs. However, there is considerable scope for further research on the former, which have been less intensively investigated than the latter. For the last decade, only one other study of EMBA students was found. It was conducted in the USA, while the current study was of UK students. Where the same issues were being investigated, similar findings emerged. However, additional issues were investigated in the UK study to those researched in the US study. In doing so, it transpired that some of the reasons students have for applying to do an EMBA can predict academic success. This addresses the concern of admissions tutors who seek early insight into whether applicants might succeed in graduate school.

The finding that learning-related reasons are associated with improved graduate GPA suggests that some EMBA students set out to integrate academically and remain loyal to this ambition. On the other hand, for those who choose forms of social integration there may be a negative impact on academic outcomes, although this is likely to be weak. These findings suggest that some students seek to commit to the discipline of management. However, further research is required into student characteristics, graduate GPAs and the environments in which graduate study is done to clarify the incidence of this commitment across programmes and countries.

Over and above these considerations, a theoretical framework was introduced. It was developed from research on undergraduates, but nevertheless proved fruitful in providing coherence across modelling approaches and in discussing aspects of recent critiques. This is not to suggest the framework is definitive. Yes, it drew attention to academic- and social integration, which proved useful in the context of graduate-business students. However, it is to be hoped that others will be encouraged to devise and test theoretical frameworks. These might include the use, not just of the pre-entry characteristics used here, but also post-entry factors such as how students develop in their programmes, the main influences on their progress, how and why their performance changes through the stages of the programme and why some students do not complete their programme.

The data used to test theory are also a matter on which progress could be made. Previous studies, and the current one, drew data from multiple cohorts of students at a single institution, although this did not produce samples of sufficient size to explore the significance of variables whose influences might be regarded as 'small effects' (Cohen, 1992). Further, given the possibility that across institutions there is considerable market and student diversity, while similar assessment standards operate, there is a case for multi-institution studies of MBA and EMBA performance.

Effects that might be small in single-institution studies might emerge as important in multi-institution studies which capture the full range of student diversity and outcomes. If such data could be added information on diverse forms of delivery and flexible provision, multi-institution studies would provide insights of benefit to teachers, students and policy makers with interests in graduate business programmes, as well as admission tutors seeking to admit students with very good prospects of succeeding. There are precedents in the form of multi-institution outcome comparisons at the undergraduate level (Donnelly *et al.*, 2007).

The approach in this paper is quantitative, although written information on application forms was searched for reasons for application. However, qualitative approaches have roles in further research. These include enquiries into the forms of experience gained before applying; the relevance of sector and moving between employers; the perceptions students have once enrolled; approaches to completing awards; the sort of analysis applied in making decisions about academic and social integration; and decisions about where, what and how to study. In the context of theory formation, it is important to note that students may be "neither

technically rational nor irrational” about choices and decisions (Hodkinson and Sparkes, 1997: 33). That is, qualitative enquiry may suggest alternatives to the approach adopted in the current paper of synthesising integration theory with rational choice (based on cost-benefit analysis).

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