UNIVERSITY ENTRANCE STANDARDS, STUDENT PRIOR PERFORMANCE AND PERFORMANCE AT FIRST YEAR LEVEL COMMERCE EXAMINATIONS

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Introduction

Admission policy to the majority of Irish Universities is based entirely on the students' examination performance at two secondary school examinations namely, the Leaving Certificate and the Matriculation. The former is compulsory. The latter is optional in theory, but in practice the majority of prospective University students will also sit the Matriculation. The grades obtained in individual papers in both these examinations are translated, for admission policy, into "points". The "points" scale for University College, Dublin is shown in Table 1:

Table 1: *"Points" Attributable to Leaving/Matriculation Examinations*

	Leaving Certificate		Matriculation
	Honours paper	Pass paper	Common paper
Grade A	5 points	2 points	5 points
Grade B	4 points	1 point	4 points
Grade C	3 points	Nil	3 points
Grade D	2 points	Nil	2 points
Grade E	Nil	Nil	Nil
Grade F	Nil	Nil	Nil

Note: In the case of Mathematics, 2 bonus points are awarded to the Honours level Leaving Certificate paper i.e. Grade A = 7 points.

For "points" purposes, the students' six best subjects are counted over the two examinations. Thus, the maximum points which can be obtained by a student is 32. (i.e. 6 "A's" including Mathematics).

In recent years two trends regarding incoming University students have been noted. First, the "points" necessary to gain admission to the Commerce Faculty at UCD have risen dramatically. This is because an increasing number of students are selecting Commerce as their preferred choice of study at University. However, the number of admissions has remained virtually static at 300. The growth in entry standards of Commerce students at UCD is shown in Table 2.

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Table 2: *Entry Standards of Commerce Students at UCD*

Entry time	Year	1st Preference	Min. points
Oct. 1989	89/90	1,556	??
Oct. 1988	88/89	1,315	23*
Oct. 1987	87/88	1,184	22*
Oct. 1986	86/87	882	21
Oct. 1985	85/86	881	21
Oct. 1984	84/85	884	19*

*Not all applicants on these points were offered places.

Second, more students are studying accounting (and other business related subjects) at secondary level. Table 3 provides a proxy measure of this growth since it indicates the total number of University applicants which are processed through the Central Applications Office (CAO) and those with "business studies" subjects.

Table 3: *Number of Leaving Certificate Students on the CAO Examinations file*

	1977		1988	
Subject	Total number of applicants	Total subject	Total number of applicants	Total subject
Accounting	12,041	1,664 (14%)	22,993	6,700 (29%)
Economics	12,041	1,924 (16%)	22,993	3,757 (16%)
Business Org.	12,041	1,659 (14%)	22,993	6,180 (27%)

It is anticipated that the trends in relation to increased entry standards i.e. the "points" and the number of students taking "business" related subjects at secondary school will continue, at least for the short term. (The total number of applications for University places processed through the CAO will probably exceed 26,000 for the academic year 1989/90). Do these trends have any implications for accounting and University educators? Is the "points" only system of admission effective? Does prior study of accounting at secondary level assist in first year University accounting exams? Conversely, do students who are studying accounting for the first time find the course moving too quickly and/or find the subject too difficult?

This article contains results of a preliminary study of the association between secondary school performance and students' first level university commerce examination performance. It is divided into four sections. Section 1 reviews the available literature in this area. Section 2 provides a description of the study and research methodology. Section 3 contains the results and finally, Section 4 discusses the results and suggests areas for future research.

Literature Review

Previous research on this topic, conducted almost exclusively in the United States, has provided contradictory results. Smith (1968) noted significantly higher overall course performance in accounting by students with secondary level accounting background. However, Baldwin and Howe (1982) and Bergin (1983) concluded that overall performance in accounting was not related to the presence or absence of a secondary level background. Both these latter studies observed higher accounting exam scores *early* in the University course by students with an accounting background, but this early advantage diminished and had totally disappeared by the final exam at the end of the first year. Thus, both studies concluded that a secondary level accounting background did not provide a significant advantage to students in the first level University accounting course.

Schroeder (1986) in his sample of 67 students noted no difference in overall course performance in accounting between college students without prior accounting coursework and those with one year or less of secondary level accounting. However, students with *more* than one year of school accounting coursework earned significantly higher scores on all exams in the University introductory financial accounting course.

Mitchell (1985) in a study based in Scotland concluded that it can be potentially rewarding for the first level accounting student to have taken accounting to *Honours* standard at school. In this case the benefits of school accounting were evidenced only in the performance of candidates in the quantitative, accounting university examinations.

More recently, Ramadan (1988) in a Jordanian study, concluded that students with school accounting qualifications performed significantly better than students who did not have such a qualifation.

The extent to which the results of the above studies can be interpreted across international boundaries is open to question. There are, for example, cultural differences in the educational environments and also differences of terminology. For example, Smith (1968) and Baldwin and Howe (1982) use the term bookkeeping to describe students exposure to accounting at school. The time period in some of the studies lasts only for one semester at University. In addition, a feature of many US University accounting examinations is the predominance of multiple choice questions. Moreover, none of the above studies differentiated in relation to the sex of the student.

Description of Research and Research Methodology

The aim of this study is to replicate, within an Irish context, previous research on the issue of whether school accounting is beneficial to students in first year Commerce exams. In addition, this study involved testing the significance, for student performance, of the "points" admission system to the University.

The 1986/87 first year class at University College, Dublin was used for this study. The course offered to this class consisted of three lecture hours per week over a 24 week academic year and forthnightly tutorials. The course is predominately "financial" as is the accounting course available at secondary school level.

The students selected for analysis were first year students at UCD who were admitted under the normal "points" requirement. Thus the sample (arbitrarily) excluded foreign students and transfer students. Finally, students registered for the course but who had not sat the examinations were also omitted. The final sample size was 278. The Leaving Certificate background (in business subjects) for the students surveyed are displayed in Table 4:—

Table 4: *Background of Respondents*

Sex:	Male 177	Female 101:	Total 278
Subject taken at Leaving Certificate	Pass	Honours	Total
Business subjects		No. taking subjects	
Accounting	None	157	157
Economics	None	89	89
Business Organisation	None	71	71

UCD points distribution and number of students		
32 points (maximum)	2 students	= N = 278
31 points	2 students	
30 points	2 students	
29 points	4 students	
28 points	3 students	
27 points	10 students	
26 points	15 students	
25 points	14 students	
24 points	33 students	
23 points	51 students	
22 points	65 students	
21 points	77 students	

The situation described above provided the opportunity to test hypotheses on the relationship between University entrance standards i.e. "points", school accounting qualifications, first year University examination performance and the sex of candidates. The following null hypotheses were tested:

★ Hypothesis 1: Relating to entry "points" and first year accounting performance.

"There is no relationship between the UCD entry "points" obtained and the accounting mark obtained in the first year examination."

★ Hypothesis 2: Relating to entry "points" and overall first year performance, defined in terms of credits obtained, the maximum credits obtainable being 16.

"There is no relationship between the UCD entry "points" obtained and the number of "total credits" obtained in the first year examination.

★ Hypothesis 3: Relating to the possession of a secondary school accounting qualification and sex of student.

"Males who have gained a school accounting qualification will not achieve significantly different examination marks in accounting from males with no school accounting qualifications."

★ Hypothesis 4: Relating to the possession of a secondary school accounting qualification and sex of student.

"Females who have gained a school accounting qualification will not achieve significantly different examination marks in accounting from females with no school accounting qualification.

Hypotheses 1 and 2 were tested using simple regression analysis with the t-value testing the null hypothesis Ho:B1 = 0. If there is no relationship between the independent and dependent variables, then B1=0. However, simple regression requires a number of assumptions including the linearity between the dependent and independent variables. As a result it was decided to further test these two hypotheses using the Chi-square (X2) test with a 99% confidence level.

Hypotheses 3 and 4 are more important for the purposes of this study. As the student samples used were independent (not matched pairs) and of differing sizes and the data measurement scale was at least ordinal, a two sample, two tailed Mann-Whitney test was used to test hypotheses 3 and 4. The Mann-Whitney test is based upon a comparison of the rank of the values of one samples in an array of the combined values of the two samples. If the two samples come from the same population, or two populations with equal means, the average rank for each should be equal.

Results

Hypotheses 1 and 2 using regression analysis

Table 5 contains the results of simple linear regression. The null hypothesis is tested using the t test on the coefficient of the independent variable, rather than the more popular F test. It should be noted that in regression models with only one explanatory variable the t test and the F test yield the same results.

Table 5: *Results of Simple Linear Regression*

	Regression No. 1	Regression No.2
Hypothesis	Ho:B = 0	Ho:B = 0
Independent variable	UCD points	UCD points
Dependent variable	Accounting mark (1st year)	Total credits (1st year)
No. of observations	278	278
R2 (coefficient of determination)	0.16	0.07
Constant	19.29	6.63
Beta coefficient (B)	8.98	0.34
Std error of beta coeff. (Se)	1.24	0.07
t-value of beta coeff. (B/Se)	7.24	4.85
Reject Ho if t-value > 2.576		
DECISION	REJECT hypothesis	REJECT hypothesis
Level of significance	a = 0.01	a = 0.01

The computed t-values (7.24 and 4.85) are statistically significant at a 1% level of significance. Thus, the entry "points" is significant in determining both first year accounting mark and total credits obtained in the first year examination overall. However, the idea of linear regression analysis relates to the assumption that the best representation of perfect correlation is a straight (linear) regression line fitted to the observed data. Based on the low coefficient of determination (R2) in both regressions it can be interpreted that the relationship between points/accounting mark and points/ total credits obtained is not linear. In addition, there are other important influences on examination performance apart from entry points.

Hypotheses 1 and 2 using Chi-square

Tables 6 and 7 shows the "points" distribution of respondents, the distributions regarding credits obtained (the maximum being 16), and accouting marks relative to average accounting mark obtained.

Table 6: *UCD "Points" and Credits Obtained by Respondents*

UCD points	No.	No. with maximum credits	No. with less than max. credits
24 to 32	85	72	13
23	51	36	15
22	65	35	30
21	77	41	36
	278	184	94

Null hypothesis: The pass rate (i.e. 16 credits) is independent of the UCD entry "points".

Chi-square = 23.94 with 3 degrees of freedom.

Reject Ho if X2 test > 11.3449

DECISION: Reject hypothesis at a = 0.01.

Table 7: *UCD "Points" and Distribution of Accounting Marks vis-a-vis Average*

UCD points	No.	No. obtaining above avg. mark	No. obtaining below avg. mark
32 to 24	85	72	13
23	51	38	13
22	65	42	23
21	77	46	31

Null hypothesis: The accounting mark (i.e. above/below average) is independent of the UCD entry "points".

Chi-square = 13.72 with 3 degrees of freedom.

Reject Ho if X2 test > 11.3449

DECISION: Reject hypothesis at a = 0.01.

Hypotheses 3 and 4

Table 8 contains the results of the Mann-Whitney test on the accounting examination performance in first year, subdivided by sex of student. The null hypothesis is emphatically rejected in both cases. Given the direction of the average marks it can be concluded that students with a school accounting qualification generally scored more highly than the others of the same sex in the first year accounting examination. Thus, boys with an accounting background score more highly than boys without an accounting background. Likewise, girls with an accounting background score more highly than girls without an accounting background.

Table 8: *Results of Mann-Whitney Test on Hypotheses 3 and 4*

	Students with school accounting		Students with no school accounting		
	No. of students	Average mark in 1st year Accounting	No. of students	Average mark in 1st year Accounting	Results of Mann-Whitney test
Male	108	77.2%	69	62.8%	Reject at a = 0.01
Female	43	78.9%	58	60.5%	Reject at a = 0.01

To further test the above results it was decided to perform multiple regression with accounting mark as a dependent variable and the following as independent variables: (1) UCD "points", (2) work effort during the year, (3) school accounting background and (4) sex of respondent. The immediate problem is how to identify and measure "work effort" during the year. Since no reliable data was generally available it was decided to use the number of credits obtained in the overall examination as a proxy variable for work effort. While this proxy variable was not the most suitable to use it was the only one available for this preliminary study. The results are provided in Figure 9:—

Table 9: *Multiple Regression Results — Accounting Mark as Dependent Variable*

Constant	54.96	R2 = 0.61
Independent variable		Coefficients (t-values in parentheses)
(1) UCD "points"		5.44 (6.18)*
(2) Work effort i.e. credits obtained		9.55 (12.90)*
(3) School accounting		32.31 (8.11)*
(4) Sex of respondent		3.16 (0.79)

*Significant at a = 0.01

The above regression results confirm that the accounting mark obtained in the first year University accounting examination is related to entry points, work effort during the year (as measured by the proxy variable of total credits obtained) and whether the respondent had a school accounting background or not. The sex of the respondent as an explanatory variable was not statistically significant.

Discussion and Conclusions

The primary purpose of this study was to provide some insights (and thus stimulate discussion) into the effect of secondary level performance including accounting performance) on students' performance in first year Univesity Commerce examinations. The exact strength of the relationships at this preliminary stage of research was not considered to be as important as the general direction of such relationships.

The results of this study are entirely consistent with the notion that it is rewarding for the first level accounting student to have taken accounting at secondary school. In this study the benefits of school accounting performance of candidates was evidenced in the first year accounting examination. It could well be that the main advantages of school accounting for the university student derives from the extra experience and practice which school study provides in the technical and computational aspects of the subject.

The results also confirm the strong relationship between entry points and overall first year examination performance. The higher the entry points, the higher the probability is that student will be successful in his first year examinations. In this sense the entry points is an efficient method of administering University admission policy although it must be acknowledged that there may be superior systems of selecting University entrants.

It would be possible to extend this study to other business subjects taught at both secondary level and at first year University courses. Such subjects include Business Organisation (Administration), Economics and Mathematics. If the results of this study were consistent with other subject areas it could mean that a student's performance in the traditional first year business courses taught at University was dependent, to a large extent, on his/her exposure to that subject in secondary school.

It is probable that entry points and prior exposure to accounting are not the only factors that affect performance at first year University examinations. We have ignored the impact of motivation yet research has shown that motivation can explain significant portions of the variance in academic performance (Grabe, 1981). Also, it is possible that socioeconomic factors influence performance. For example, Eskew and Faley (Eskew and Faley, 1988) found that in addition to exposure to accounting at secondary level, ability and effort/motivation are also important variables in explaining performance.

While the ability to generalise from a single study is always limited, these

results confirm the existence of a situation which is of concern to those involved with first level accounting University education.

The indications are that those students without leaving certificate accounting may need extra attention to avoid being disadvantaged in the practical aspect of the subject. This could be achieved by alerting students to the problem at the start of the academic year and providing supplemantary/remedial lectures or additional tests. The extent of this supplementary assistance is a matter of judgement. However, Australian research by Braye and Craig (1980) concluded that remedial tuition appeared to have no effect on students' examination performance. (The respondents were in favour of retaining remedial teaching and its greatest benefit appeared to be in reducing examination stress).

Knowledge of students' previous exposure to secondary accounting may help accounting lecturers change the structure their first year accounting courses. One possibility is to offer one introductory course for those with appropriate secondary level exposure and another for those with no or inadequate exposure. The two courses could examine the same material but in different ways. After all, if these two groups start out as "unequals", should they not be treated as such?

Alternatively, it may be desirable to revise the first year accounting syllabi to incorporate accounting theory and/or managerial accounting. On the other hand, it could be argued that certain first year students will always have some advantage over others, whether it be prior exposure to accounting or something else. As a result, first year students can never be a homogeneous group. Thus the results of this study simply confirm the "natural order of things".

These findings have implications for secondary students (and their career advisors) who are interested in pursuing a University degree in Business Studies. In particular, since first year accounting courses could "make or break" students, exposure to secondary school accounting may help to mitigate the drop or failure rate among first year students during one of their most vulnerable times at college. Indeed, the performance in first year accounting examinations may be an important factor for a student in deciding whether to subsequently "major" in accounting.

In conclusion, the results are based on ONE sample — a sample which may not be representative of other years or other Institutions. Some answers are provided but wait to be verified by additional research using more sophisticated methodology and data. In the meanwhile, the purpose of the paper will have been achieved if it convinces policy makers that the

topic is worthy of further research. After all, the education process begins with having someone to educate!

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