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A DISCRIMINANT FUNCTION MODEL  
FOR UNDERGRADUATE ADMISSIONS  
AT BEIRUT UNIVERSITY COLLEGE

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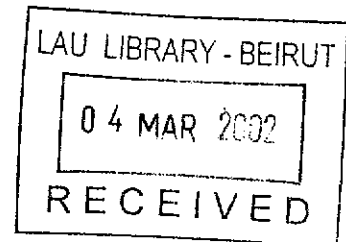
A Research Topic  
Presented to Business Division  
Beirut University College

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Science in Business  
Management

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BY  
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June, 1988



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TITLE OF RESEARCH TOPIC A Discriminant Function Model for  
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The following professors nominated to serve as the advisors of the above candidate have approved her research work.

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NAME

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SECOND READER

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## CHAPTER I

### INTRODUCTION

Beirut University College, a Liberal Arts institution, holds a strong position in character and quality among institutions of higher education in Lebanon. The college offers outstanding educational opportunities in the Liberal Arts and sciences as well as in selected professions. The diversity of programs offered at BUC encompasses undergraduate as well as graduate courses. BUC offers several academic areas and a full range of degree programs including Bachelors' and Masters' degree, two year associate degree, full and part-time degree programs as well as non-degree certificate program.

For the past two years, the number of applicants to BUC has immensely increased due to several reasons. One of them, and may be the most important one, is the bad economical situation that reigns the country so that students cannot afford to study abroad anymore like in the past. As the number of applications is increasing, the college cannot continue with the same policy of admitting students since it has reached its capacity in the number of students enrolled. In addition, The number of students placed on academic probation each semester is of our primary concern to which there should be some reasons. The basis of admissions on which the student was accepted could be one of them. What are the requirements for admissions at BUC?

What variables count more in the admissions process? And is it the appropriate way to admit students in the future, whereas the enrollment pressure is becoming so high?

#### Historical Background

Founded in 1835, as the American School for Girls, a two year program was added to the high school in 1924, thus providing a Junior college course, and the name was then changed to the American College for Women. In 1927, the American Junior College for Women was relocated in Ras Beirut as a separate institution. In 1949-50, after continued growth and organizational changes, the college was expanded to make it a university level institution, and the name was changed once again to Beirut College for Women (BCW). During that year, BCW was accredited as a degree granting institution by the board of regents of the University of New York.(1)

The year 1970 was an important year in the history of BUC when the College's Bachelor of Art and Bachelor of Science had been officially recognized as equivalent to the national Licence degree by the Lebanese Government. In 1973, BCW was renamed "Beirut University College", and in October 1975, all majors offered at BUC were opened to male students.(2)

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1  
Beirut University College, Academic Catalogue, 1985-87,  
P.7

2  
Ibid., P.8



Programs and degrees offered at BUC

Beirut University College offers numerous programs of study leading to the following degrees:

I- The Applied Language Division offers:

A- The degree of Bachelor of Arts in (3)

1- Teaching Arabic as a Foreign Language (TAFL)

2- Teaching English as a Foreign Language (TEFL)

B- It offers as well Intensive English Program to prepare students to do adequate college work in English, and special Arabic program to prepare students to master the basic grammatical structures in colloquial and standard Arabic, and to master the essentials of reading and writing in Standard Arabic. (4).

II- The Business Division offers:

A- The degree of Bachelor of Science in

1- Business Studies with emphasis in (5)

a- Accounting

b- Economics

c- Management

d- Marketing

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3  
Ibid.

4  
Ibid.

5  
Ibid.

B- The degree of Bachelor of Science in Business/Computer.

C- The degree of Associate in Applied Science in (6)

1- Business Management

2- Secreterial Studies

D- The degree of Master of Science in Business Management.(7)

III- The Humanities Division offers:

A- The degree of Bachelor of Arts in:

1- Fine Arts

2- Communication Arts with emphasis in

a- Radio/TV

b- Drama

c- Journalism

3- English

History, Music, Philosophy, and Relegion (in cooperation with the Near East School of Theology) are offered as supporting fields.(8)

B- The degree of Associate in Applied Science in (9)

1- Advertising Design

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7

Ibid.

8

Ibid.

9

Ibid.

- 2- Communication Media with emphasis in
  - a- Communication
  - b- Journalism
  - c- Advertising
- 3- Interior Design
- 4- Library Science
- C- The degree of Associate in Arts in Liberal Arts.(10)

IV- The Natural Science Division offers:

- A- The degree of Bachelor of Science in (11)
  - 1- Biology/Chemistry
  - 2- Chemistry
  - 3- Computer Science
  - 4- Computer/Math
  - 5- Math Education
  - 6- Science Education
- B- The degree of Associate in Applied Science in Computer Science.(12)
- C- The degree of Associate in Arts in General Science.(13)

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10  
Ibid.

11  
Ibid.

12  
Ibid.

13  
Ibid.

D- It offers as well a Dual Degree, And a Pre-Pharmacy programs in cooperation with universities in the United States, under which the students attend BUC (through the Junior year for Dual Degree program, and two years for the Pre-Pharmacy program), and then proceed to the U.S. for additional two or three years of study at the end of which they receive a B.S. in Engineering or Pharmacy, and a degree in General Science from BUC.(14)

V- The Social Science Division offers:

A- The degree of Bachelor of Arts in (15)

1- Human Development with emphasis in

a- Developmental Psychology

b- Early Childhood Education

c- Elementary Education

d- Social Work

2- International Affairs with emphasis in

a- Consular and Diplomatic services

b- Developmental Studies

c- International Economics

B- A program leading to a Teaching Diploma.(16)

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14

Ibid., P.14

15

Ibid., P.13

16

Ibid.

C- The degree of associate in Applied Science in  
Teacher Education.(17)

Students who have completed the requirements of the Associate in Applied Science or Associate in Arts programs (AAS/AA), may pursue a Bachelor of Arts or Bachelor of Science (BA/BS) Regents College Degree, whereby courses taken at BUC are evaluated by the program officers of the University of the State of New York (which has an agreement with Beirut University College) who issue the degree.(18)

Need for the study

Over the past two years BUC became overcrowded with many new students admitted to the several majors offered at the College, with no plans for expanding the Campus in the near future. The enrollment for the past two years is shown in Table (I).(19)

The capacity of Beirut University College is 2500 students, which means that the enrollment in the Fall Semester 87 exceeded the limit. This implies that BUC cannot accept more than the number of students graduating in the Fall 87 and Spring 88. The number of applications received to date for the next year is 1992 applications.

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18

Ibid., P.14

19

Statistical Reports- Registrar's Office BUC

TABLE I  
ENROLLMENT AT BUC 1985-87

<u>SEMESTER</u>	<u>TOTAL NO. OF STUDENTS ENROLLED</u>	<u>NO. OF NEW STUDENTS ENROLLED</u>
Fall 85	1475	325
Spring 86	1699	362
Fall 86	2040	564
Spring 87	2527	659
Fall 87	2723	531

Source: Registrar's Office- Records

Using the same policy for admissions, we would accept a large number of students, the College cannot afford.

Still another reason for the study is the increasing inability of students to do college work, and this is reflected by the high number of students placed on Academic Probation each semester. The students' achievement may be affected by so many factors, the basis on which the student was admitted to enter the college could be one of them. If we had another policy of admissions, we could have predicted the failure of some students in advance. Table II shows the number of students placed on Academic probation for the past two years:(20) As one can see from Table I and II, that we had 531 new students out of which we have 236 (36 percent) placed on Academic Probation

#### Purpose of the Study

Since BUC cannot accept a lot more than the number of students graduating each semester, which is a small number out of the applications received, a careful study of the basis of admissions on which the student would be accepted to a certain major is needed. Thus enabling the Admissions Committee to select the appropriate number of students with the acceptable standard, and to the appropriate major. The purpose of this

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20

Ibid.

TABLE II  
NO. OF STUDENTS PLACED ON ACADEMIC PROBATION 1985-87

<u>SEMSTER</u>	<u>TOTAL NO OF STUDENTS ON ACADEMIC PROBATION</u>	<u>NEW STUDENTS ON PROBATION</u>
FALL 85	189	36
SPRING 86	214	94
FALL 86	215	46
SPRING 87	432	236

Source: Registrar's off- Records BUC



study is to predict the objective criteria based on statistically tested variables in admitting students. Raising admissions standard serves to improve the academic performance of students enrolled.

#### Research questions

- 1- How can we discriminate between successful and unsuccessful students on the basis of a least square composed of K selected variables?
- 2- What are the major characteristics of the selected students?.
- 3- What are the best discriminating variables selected according to their ability to discriminate between successful and unsuccessful students?

## CHAPTER II

### REVIEW OF LITERATURE

Educational institutions vary immensely; some practice selective admissions to a high degree, and some other not at all. For many colleges, Admissions is not only a mean of shaping the institution, but for some a mean of survival. Selective colleges do not only have many more applicants than they can admit, but they have many more qualified applicants than they can enroll. What we should mention first is the types of colleges and universities that exist.(21)

First are the open door institutions in which virtually all applicants are accepted without regard to the Standardized Test scores, grade average, or class rank.

Second category is the selective one, it comprises those colleges that serve only students who achieved certain academic requirements. They may have their requirements as the attainment of a certain grade average in high school, or test scores. The colleges vary greatly in their requirements, but they are alike in the fact that applicants who meet their requirements can be admitted.

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21

American Association of Collegiate Registrar's and Admission officers, Undergraduate admissions, (New York:1988), P.34

The third category is called competitive. These colleges specify their requirements, but for various reasons, they have more applicants who meet these requirements. So an applicant cannot be sure of admission just because he satisfied the requirements; the college will select the desired number of students according to certain factors.(22)

#### Review of Researches

Different colleges have different requirements for admission, from the high school average, and the rank in class to the entrance exams. Many studies have been conducted concerning the prediction of academic performance measuring different variables in the applicants' abilities in an attempt to properly selecting students who are of college caliber. In the following section a review of reseaches, as well as the admissions requirements for some of the U.S. Colleges, the Beirut University College, and the American University of Beirut will be presented.

#### Admissions requirements

A survey of 1,463 colleges was done concerning the admissions requirements.(23) At open door institutions, admissions requirements are simple and objective determined by state or local governments, or by the institution's board of trustees. As for the competitive, and the selective colleges

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22

Ibid.

23

Ibid., P.10

certain requirements should be completed. Fifty percent of the competitive institutions reported that they require three units of Math, two units of Foreign Language; and sixteen percent of the selective require as many units in Math, Science, etc..., scores on SAT and ACT, essays, recommendations, and certain personal qualifications.(24)

Many colleges in the survey reported that they have certain minimum standards of academic qualifications below which applicants cannot be admitted. These minimum standards may be expressed as high school averages, rank in high school, scores on the Scholastic Aptitude Test (SAT), or the American College Testing Program Assessment (ACT). The average minimum grade averages reported by all the colleges was 2.00 or a C average on a scale of 4. The average minimum percentile rank in class was forty three, which means that applicants have to rank in the upper forty three percent of their high school class to be considered eligible for admissions. The average sum of SAT Verbal and Mathematical scores was 370, and the SAT ranges from 200 to 800. For the ACT the average score was 33 which ranges between 20 to 80 (25)

#### Predicted Academic performance

The prediction of academic performance is often made by the college's admission staff and based on its observations of

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24

Ibid., P.36

25

Ibid., P.10

how the past performance of students correlates with achievement. Such predictors are based on mathematical analyses of the correlation between high school grades, test scores, and first semester GPA. A prediction equation is then used to estimate each applicant's probable GPA. Such estimates like the predictors used are subject to error, and they are not used alone as the basis for admissions, however they are more accurate than the subjective judgement of most observers.(26)

Breland (1985), and after examining numerous regional and national reports pertaining to admissions, identify four basic models for admissions used in colleges and universities.(27) First is the Single-Index Minimum, in which A single index is used to determine eligibility such as test score, high school GPA, rank in high school, recommendation etc...(28) Second is the Multiple-Index Minimum, where two or more indexes are used to determine eligibility like GPA, and test scores together. (29)Third is the Either-OR-Minima, to determine eligibility a minimum has to be equalled, or surpassed on either of one or more indexes. For example if a SAT score or high school grades

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26

Ibid., P.12

27

Paul D. Langston & Carolyn V. Boyles, "The Search For a New Mission & New Admissions Standards", College and University, Spring 1987, P.186

28

Ibid., P.187

29

Ibid.

are above a certain value.(30) Fourth is the Predicted Performance, in which high school GPA is combined with a test score to predict college performance. From data on past students a regression equation is developed to be used in predicting performance for applicants.(31)

Given the varied kinds of information required by colleges of their applicants for admissions which credentials count most in admissions decisions? A survey was conducted dealt with thirteen credentials beyond high school graduation. For most open-door institutions, they do not consider these credentials in their decisions for admissions. For competitive and selective colleges, certain credentials had the same degree of importance for both of them. Eighty six percent of the selective, and eighty five percent of the competitive colleges rated high school performance (represented by high school grades or class rank), as either the single most important factor, or a very important factor in their decisions. Next in the frequency of ratings, were the Aptitude Test scores such as SAT, ACT, which were regarded as the most important or very important by sixty three percent of the competitive colleges, and fifty eight percent of the selective ones. the third rank among the credentials was the subjects taken at the high

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30

Ibid., P.188

31

Ibid.

school, rated as very important factor by sixty percent of the competitive colleges, and thirty three percent of the selective ones. None of the other credentials were rated as important or higher by either the competitive, or the selective colleges.(32)

Breland concluded that high school grades, and Tests scores were the best predictors for academic performance.(33) Other materials used in admissions such as recommendations, bio-data, essays, etc... added a little amount to the predictive power.

Studies on the validity of other factors considered in admission proved to be disappointing.(34) As an example the recommendation by the high school principal or teacher, where the candidate will logically select as a reference the person(s) who is likely to give a good recommendation(s). Several recent studies have conclusively shown that the approach of using multiple correlation, with two or three measures results is a better prediction than the more subjective evaluation by even trained personnel who have the same variables in addition to other information including

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32

American Association of Collegiate Registrar's and Admission Officer, Undergraduate Admissions, P.37

33

Robert Klitgaard, Choosing Elites, (New York: Basic Book, 1985). P.45

34

Paul L. Dressel, Evaluation in Higher Education, (Boston: Paul L.Dressel), P.313

interviews with the applicants.(35)

Dawes and his colleagues demonstrated that subjective judgements of admissions officers add nothing to the ability to predict academic performance. In a recent study of nine private colleges, Breland and Willingham showed that the median correlation between the first year college GPA, and a combination of SAT scores, and prior grades was 0.51. Adding twenty three different variables, will raise the correlation by only 0.04. This implies that the admission officer ratings have less predictive power than the combination of the test scores, and high school GPA. Even if it is added to that combination, it did not improve the prediction of academic performance.(36)

'It may be that the prediction of some other academic outcomes could be improved by using other sources of information. But to predict undergraduate grades, we have to rely on high school grades, and tests scores'.(37)

#### Admissions requirements in the U.S. Colleges

The greater number of colleges have a comparable approach to the question of admitting students. To get a clearer picture of what the colleges and universities seek in their admittance

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35

    Klitgaard, Choosing Elites, P.108

36

Ibid.

37

Ibid.



requirements, it may be well to summarize the entrance program of some typical colleges, and universities. A comparative table for twenty five college and university, as well as a review of the requirements for admissions for the important ten are included in this section.

1- The American University (Washington, Col.)

The American University requires that a student be graduated from an accredited secondary school with 16 units which must include : four units in English, two units in Math, and ten additional academic credits. The applicant should rank in top half of secondary school class, and should sit for the CEEB, SAT, and two achievement Tests (English and Math). (38)

2-Anderson College (Anderson, Ind.)

For admissions, graduating from an accredited secondary school is required with sixteen units which must include: four units of English, two units of Foreign Language, two units of Math, and eight additional academic units. The rank should be in top three fourth of secondary school class, and the applicant should pass the CEEB SAT.(39)

3-California State College (California, Pens.)

California State College requires no set pattern of subjects in high school. The student should be a graduate from an accredited secondary school, and should rank in the top

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38

W. Todd Furniss, American Universities and Colleges, (Washington D.C.: The American Council on Education, 1973), P.327

39

Ibid., P.502

three fifths of the secondary class, and have the CEEB SAT.(40)

4- Columbus College (Columbus, Georg.)

Admissions to the Columbus College requires: graduation from accredited secondary school, the completion of seventeen units which must include four units in English, two units in Social Studies, two units of Math, one unit in Natural Science, and five additional academic units. Two units of Foreign language is recommended. The candidate should pass the CEEB SAT.(41)

5- Connecticut College (New London, Connect.)

Connecticut College requires for admissions, graduation from accredited secondary school with four units in English, three units of Math, one unit of U.S. History, and one unit of Foreign Language. CEEB SAT, and three achievement Tests are as well required.(42)

6-George Washington University (Washington, Col.)

This university developed the requirements as follows: Completion of four credits of English, two units in Foreign Language, two units in Math, two units in Science, two units in Social Studies. The student must have a B average, and rank in the top forty percent of secondary class. The

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40

Ibid., P.1331

41

Ibid., P.388

42

Ibid., P.299

applicant should take the CEEB SAT, or the ACT, and one achievement Test in English.(43)

7- Harvard University (Cambridge, Massach.)

Admission in Harvard University requires graduation from an accredited high school, with four units in English, four units in Foreign Language, four units in Math, two units in History, one unit in Laboratory Science, and one unit in Music or Art. The rank should be in the top ten percent of secondary school class, and the applicant should pass the CEEB SAT, and three achievement Tests.(44)

8- Notre-Dame College (St. Louis, Mis.)

Notre-Dame College requires as the other colleges and universities the completion of sixteen units in accredited high school. Ranking in the top half of secondary class ,and passing the ACT Program.(45)

9- University of Illinois (Chicago, Ill.)

To be admitted in the University of Illinois, one has to complete three units in English, one unit in Algebra, one unit in Geometry, rank in the top fourth of secondary school class, and pass the ACT Program.(46)

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43

Ibid., P.335

44

Ibid., P.729

45

Ibid., P.880

46

Ibid., P.491

10- University of Miami (Florida, Flor.)

In the University of Miami having a C+ average in high school, completing fifteen units, and passing the CEEB SAT are required for admission.(47)

From table III one can see that Educational Institutions vary immensely. Certain colleges and universities require different credentials for admission. Not all the Colleges require the accreditation of the high school, (for example the Anderson College, George Washington University, etc...), but they do require the completion of a certain number of units in high school , mainly fifteen or sixteen units.

All of the Universities and Colleges stated in TABLE III have a certain academic requirements like the Entrance Examinations. The CEEB SAT is required by all except George Town College, Notre-Dame College, and the University of Illinois where the ACT program is needed instead. Along with the CEEB SAT ten Universities out of the twenty five require different Achievement Tests. Recommendation from the high school is needed only by Hartford University. Twenty one of the Colleges and Universities have a minimum grade average at high school, which is C or 2.00 point average on a scale of 4.00, below which students cannot be accepted. Very few (George Washington University, Harvard University, Oklahoma University,

TABLE III

REQUIREMENTS FOR ADMISSIONS FOR CERTAIN UNIVERSITIES AND COLLEGES IN THE U.S.A.

UNIVERSITIES	H.SCH. ACCRED.	UNITS REQUIRED TO BE COMPLETED IN HIGH SCHOOL							NO. OF ACHV. TEST	CEEB SAT	ACT	RECOMM.	RANK	AVERAGE	
		MATH	SC.	SO. SC.	HIST.	ENGL	LANG.	NAT SC.							
AMERICAN UNIV.	X	2				4			16	2	X			TOP HALF	C
ANDERSON COLLEGE		2				4		2	16		X			TOP 3/4	C
BARNARD COLLEGE		3			1	4	4		15	3	X				C
CALIFORNIA STATE UN.	X										X			TOP 3/5	C
COLUMBUS COLLEGE	X	2		2		4	2	1	15		X				C
CONNECTICUT COLLEGE	X	3			1	4	1		15	3	X				C
DUKE UNIVERSITY		2		2		4	2		15	3	X				C
GEORGE TOWN COLLEGE		2		2		4	2		15	3	X			TOP FIFTH	C
GEORGE WASHING. UNV.		2		2		4	2		15			X			C
HARTFORD UNIVERSITY	X	2		2		4	2		15	1	X			TOP 2/5	B
HARVARD UNIVERSITY	X	4		2	4	4			16	3	X	X		TOP 10%	B
HOWARD UNIVERSITY		2		2		4	2		15	2	X				C
INDIANA COLLEGE	X					4			16		X			TOP HALF	C
LINCOLN UNIVERSITY									15	3	X				C
NOTRE-DAME COLLEGE	X								16			X			C
OKLAHOMA UNIVERSITY	X								15		X			TOP HALH	C
SOUTH CAROLINA COLL.	X	2		2		4	2		15		X	X		TOP HALF	B
UNIV. OF HOUSTON		3		2		4	2	2	15		X			TOP HALF	C
UNIV. OF ILLINOIS		2				4			15		X	X			C
UNIV. OF MIAMI	X								15			X		TOP FOURTH	C
UNIV. OF NEW HEAVEN	X								15		X				C <sup>+</sup>
UNIV. OF RICHMOND		3		1		4			15		X				C
UNIV. OF VERMONT		2		2		4	2		15	3	X				C
WINTERBERG UNIV.	X	3		3		4	3		16		X				C

and the University of Miami) require an average of B or C+. A minimum percentile rank is set by eleven college and university, some would require their applicants to rank in the top half, others in the top three fourth, and still others in the top ten percent (Harvard University).

From this brief view of only twenty five college and university, we can conclude that colleges vary greatly in their requirements, but they are alike in the fact that all require certain tests, a minimum average at high school along with the completion of a specific number of academic units.

#### Admissions Requirements at Beirut University College

Different Programs and classes are offered at BUC with different requirements for admission.

#### Sophomore class of the BA/BS program

Each student holding the Lebanese Baccalaureate part II is eligible to follow the sophomore class of the BA/BS program. Students holding the Literary Lebanese Bacc.II can follow the Sophomore Arts program. Students choosing to enter the Sophomore Science program, will have to pass the Sophomore Entrance Examinations in Mathematics and Science. If these examinations are not passed, they will have to take additional courses in the Freshman Mathematics, and Science as prerequisites for starting the Sophomore Science program.

Students holding the Scientific Lebanese Bacc.II are eligible to follow either the Sophomore Arts, or the Sophomore Science of the BA/BS program.(48)

Students holding other official, and high school certificates, may enter the sophomore class if they meet two conditions.(49)

1- If their certificates are recognized by the Lebanese Ministry of National Education as being equivalent to the Lebanese Bacc.II

2- If they pass the Full Sophomore Entrance Examinations.

Students entering the Sophomore class must have a score of 600 or above on the English Entrance Examinations, or 625 on the TOEFL, and pass an Essay Test given at BUC.Students scoring 600 on the English Entrance Examination, but fail the Essay Test will be classified as Sophomore and must take six additional credits of Freshman English.Students scoring between 500 and 599 will be as well classified as Sophomore, but with eight additional credits of English. Students with a score below 500 (400-499), may enroll in the Intensive English Program.(50)

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48

BUC Academic Catalogue, P.28

49

Ibid.

50

Ibid.

Freshman class of the BA/BS Program

Students holding an Official Government Secondary Certificate are eligible to enter the Freshman class of the BA/BS program. Their certificates must be recognized by the Lebanese Ministry of National Education as being equivalent to the Lebanese Bacc.II, and must pass the English Entrance Examination, or the TOEFL.(51)

If the certificate they hold differentiate between an Art program, and a Science program, students holding the Art certificate may follow the Freshman Art Program. Choosing the Freshman Science Program, they have to pass the Freshman Entrance Examinations in Science and Mathematics. Students holding the Science Certificate may be admitted to either the Freshman Arts or Freshman Science Program.(52)

Sample of the Official Certificates

The Egyptian Secondary Certificate

The French Baccalaureate II, or the New French Bacc.

The General Certificate of Education

The German Abitur

The International Baccalaureate

The Jordanian Secondary Certificate

The Kuwait Secondary Certificate

The Saudi Secondary Certificate

The Syrian Baccalaureate

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51

Ibid., P.26

52

Ibid.



Freshman class of the AA/AAS Program

Applicants holding an officially recognized high school certificate, or its equivalent are eligible to enter the Freshman class of the AA/AAS Program. Students must pass the Full Freshman Entrance Examinations, or the College Entrance Examination Board Tests (CEEB), or the American College Testing Program (ACT), and the English Entrance Examination. Students holding the Lebanese Bacc.II, who choose to follow the AA/AAS program shall be given a minimum of thirty credits on the Freshman level.(53)

Non-Lebanese holders of the General Certificate of Education (G.C.E.), will be admitted to the Freshman class of the AA/AAS program provided they passed in at least five subjects at the Ordinary Level, and if they pass the English Entrance Examination. They will be admitted to the Freshman class of the BA/BS Program if they pass in at least five subjects two of which must be at the advanced level, and have their certificate recognized by the Ministry of National Education as being equivalent to the Lebanese Bacc.II. Applicants who meet these requirements may enter the Sophomore class if they pass the Full Sophomore Entrance Examination administered at the American University of Beirut.(54)

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53

Ibid., P.29

54

Ibid., P.27

### Transferring to BUC

Applicants transferring from one university to BUC must submit an official transcript of credits from the college or university attended during their first semester at BUC. They must as well meet the admissions requirements of either the BA/BS, or the AA/AAS program. Students transferring from colleges and universities of good standing, will receive credits for the courses in which they obtained a grade of C or above. These transferable credits will be counted towards graduation. Applicants coming from institutions where English is not the language of institution must pass the English Entrance Examination at the required level of admission.(55)

### Admission Requirements at AUB

The American University of Beirut has the same requirements for admission as Beirut University College: High school grades, recommendation, and Entrance Examination.

### Admission Procedure at BUC

Current enrollment pressures make it necessary for the College to establish selection systems designed to identify from among a large pool of applicants those who are most likely to succeed. Data reveals that of the conventional academic, and intellectual measures, high school performance, and college

admission tests scores are the most used predictors of academic success in college. A weighted combination of high school performance, and test scores is used to establish priorities for admission among applicants.

In the Fall Semester 86, and the Spring Semester 87, the Admissions Committee selected students holding a Lebanese Bacc.II, who scored at least forty five on the Scientific Quantitative Test (SQ), and 500 on the English Entrance Exam (EEE) to enter as sophomore to the BA/BS program. Those having a score of 350 on the Full Freshman Entrance Exams, and 500 on the EEE were admitted to the Freshman class of the AA/AAS Program. Regardless of the major declared on the application, one student scoring forty five on the SQ Test, and 500 on the EEE, and another scoring seventy on the SQ, and 550 on the EEE, and having acceptable high school performance, were both admitted, for example, to the Computer Science major of the BA/BS program. For this reason one can see why some majors at BUC with a high enrollment, and some others with very few. Table IV shows the enrollment statistics at BUC for the years 1985-87.

Applicants who scored below 500 on the EEE were admitted to the Intensive English Program. Students holding the Lebanese Bacc.II, who passed the SQ Test, with a weak high school record, or with a very good high school performance, but failed the SQ Test were admitted to the Freshman Class of the BA/BS Program.

TABLE IV  
ENROLLMENT STATISTICS AT BUC 1985-87

MAJOR	FALL 85	SPRING 86	FALL 86	SPRING 87
UNCLASS	318	364	364	356
BUSINESS MASTER	83	71	78	80
BIOLOGY	5	7	14	36
BIO/CHEMISTRY	13	32	76	96
CHEMISTRY	10	14	17	32
COMP/MATH	13	21	13	21
COMP. SC.	170	201	317	419
DUAL DEGREE	17	21	23	21
MATH EDUCATION	3	6	7	22
PRE-PHARMACY	19	32	30	12
SCIENCE EDUCATION	1	2	1	1
HUMAN DEVELOPMENT	46	54	80	116
INTERNATIONAL AFFAIRS	14	17	18	22
POLITICAL SCIENCE	8	8	7	15
TAFL	0	0	2	2
TEFL	11	19	21	30
BUS/COMP	167	202	205	249
BUSINESS STUDIES	319	356	467	645
COMMUNICATION ARTS	28	36	48	69
FINE ARTS	21	22	19	26
INTERIOR DESIGN	102	100	114	132
GENERAL SCIENCE	11	13	12	13
TEACHER EDUCATION	25	25	23	18
SECRETARIAL STUDIES	6	5	3	2
ADVERTISING DESIGN	21	27	35	37
COMMUNICATION MEDIA	25	28	30	39
LIBERAL ARTS	4	6	10	12
LIBRARY SCIENCE	11	10	6	4
TOTAL	1475	1699	2040	2527

Source: Statistical Reports. Registrar's Office BUC

The Admissions Committee did not require different requirements for the different majors offered at the College, but rather the same requirements for all majors.

#### Tests Required

Some tests of basic knowledge and skills had to be devised to evaluate what a student learned in high school. Many tests are introduced in an attempt to have some common indicators by which students' abilities are compared. Scores of these tests were initially intended to measure whether the student has mastered basic skills. The tests required are the Scientific Quantitative Test (S.Q.), The Full Freshman Entrance Examinations, The English Entrance Examination (EEE), or the Test of English as Foreign Language (TOEFL), The College Entrance Examination Board Tests (CEEB), or the American College Testing Program (ACT).

Candidates applying to the BA/BS program must sit for the S.Q. Test, and the EEE or the TOEFL, and those applying to the AA/AAS program must take the Full Freshman Entrance Exams or the CEEB or the ACT Test, and the TOEFL.(56)

#### The English Entrance Examination or the TOEFL

The TOEFL and the English Entrance Examination are tests intended to objectively measure the student's English proficiency. The standard scale of the EEE was established with a mean score of 500 on a scale from 200 to 1000, and the TOEFL

a mean score of 525. The validity of the scores of these tests at BUC is one Calendar year.

From this one can conclude that BUC requires more or less the same requirements for admission as for the U.S. Colleges: High school grades, certain Entrance Examinations, and recommendations. What differs is the program to which the student is accepted. In the American Colleges, students graduate from high school and start as Freshman, while in Lebanon another type of official certificate exists (The Lebanese Baccalaureate Part II). This enables the student holding such a certificate to enter the College directly as a sophomore in the BA/BS program, and not as Freshman granting him, by this certificate, thirty credits on Freshman level.

#### The Scientific Quantitative Test and the Freshman Entrance Exams

These tests are administered to measure quantitative, and analytical abilities, and subject tests measuring achievement in different subjects: Biology, Chemistry, Physics, Mathematics, Arabic, Humanities, History, and Social Science. The standard scale for the S.Q. Test in 1986-87 was established with a mean score of fifty on a scale from twenty to one hundred, and for the Freshman Entrance Exams a mean score of 350 on a scale from 200 to 1000.

### The College Entrance Examination Board Test (CEEB)

Through the cooperation of many of the leading colleges in the U.S., general examinations are provided by the College Entrance Examination Board (CEEB). The CEEB Tests are divided into three sections.(57)

- 1- The Scholastic Aptitude Test (SAT)
- 2- The Achievement Tests
- 3- The Comprehensive Mathematical Test

Many colleges require either the College Board's Scholastic Aptitude Test (SAT), or the American College Testing Program (ACT), and some other colleges require Achievement Tests which are also administered by the College Board.(58)

### The Scholastic Aptitude Test (SAT)

The Scholastic Aptitude Test, required by many colleges and universities throughout the U.S., is designed to evaluate the applicants aptitude for academic work. The SAT is a three hours, multiple-choice test made up of verbal and math sections for two hours and a half, and thirty minutes of Test of Standard Written English (TSWE).The verbal questions test the applicant's vocabulary, verbal reasoning, and understanding what he reads. The Math questions test the applicant's ability

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57

Benjamin Fine, Admission to American Colleges, (New York: Harper & Brothers, 1980), P.103

58

Scott Gelband, Catherine Kubale, Eric Schor, Your College Application, (New York: Scott, Kubale, Schor, 1986), P.27

to solve problems involving Arithmetic, Algebra, and Geometry.(59)

The TSWE is a multiple-choice test given at the same time as the SAT, but it has different purpose. The TSWE is intended to be used to help the college choose an English course appropriate for the applicant's ability.(60)

The SAT and the TSWE are included in the same text book. The SAT score is on a scale of 200 to 800, and the TSWE is based on a 20 to 80 scale. Each book is divided into six sections:

- 1- Two SAT-Verbal sections
- 2- Two SAT-Math sections
- 3- One TSWE section
- 4- One section of equating questions (verbal, Math, or TSWE)

These verbal and mathematical abilities are related to how well the applicant's will do academically in college.(61)

#### The Achievement Test

Each of the College Board Achievement Test measures the applicant's knowledge or skills in a particular subject,

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59  
Gelband, Your College Application, P.28

60  
Ibid.

61  
Ibid.



and his ability to apply that knowledge.(62) The fourteen tests fall into five general subjects areas:

- 1- English
  - English composition (multiple choice with essay)
  - Literature
  
- 2- Foreign Language
  - French
  - German
  - Hebrew
  - Latin
  - Spanish
  
- 3- History and Social Studies
  - American History and Social Studies
  - European History and World Cultures
  
- 4- Mathematics
  - Math Level I
  - Math Level II
  
- 5- Sciences
  - Biology
  - Chemistry
  - Physics

All the Achievement Tests take one hour of testing time. These scores are reported on a scale of 200 to 800. The student will receive a separate score for each test as well as an average score for all the Achievement Tests. Scores on the Achievement Tests can help in assessing how well prepared the applicant is for different programs of college study.(63)

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62  
Ibid.

63  
Ibid.

### The Comprehensive Math Test

It is used to test the candidate's knowledge in Algebra, Geometry, trigonometry, and Logarithms. It is designed for students who wish to enter courses in Engineering, or other Sciences which have Math as a Prerequisite.(64)

### The American College Testing Program (ACT)

The ACT is required for admission by many schools. This test is designed to measure the applicant's current level of educational development in four areas: English usage, Math usage, Social Studies reading, and Natural Science reading. It is intended as well to assess the applicant's ability to perform tasks generally required in college. The scores of the ACT Tests range between one and thirty six for each test, and an average score for the four tests scores.(65)

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64

Fine, Admission to American Colleges, P.104

65

Gelband, Your College Application, P.104

## CHAPTER III

### PROCEDURE AND MEHTODOLOGY

Many Variables play a role in the admissions process. In this chapter we will try to define the major characteristics of the selected students, and how to classify the incoming students in each division, and what are the best discriminating variables for new applicants. This study intends to determine the best combination of measures which will maximally discriminate between incoming students.

#### Population of this Study

In this study the population is the body of students at BUC in different majors, and divisions. There are 1,732 students, of which 746 (43 percent) are majoring in Business, 604 (35 percent) are from the Natural Science Division, 153 (8.8 percent) from the Social Science Division, and 32 (1.8 percent) from the Applied Language Division.

A study of Table V reveals that the highest percentage of enrollment (43 percent, and 35 percent) are in the Business Division, and the Natural Science Division. Only few students (1.8 percent) are from the Applied Languages Division , and (8.8 percent, and 11.4 percent) from the Social Science, and the Humanities Divisions respectively.

TABLE V

## STUDENT ENROLLMENT STATISTICS AT BUC (BA/BS PROGRAM) 1986-87

MAJOR FIELD OF STUDY	FALL 86	%	SPRING 87	%
Bus-Comp	205	16.2	249	14.4
Business	339	26.8	497	28.6
<b>BUSINESS DIVISION</b>	<b>544</b>	<b>43%</b>	<b>746</b>	<b>43%</b>
Bio-Chemistry	90	7	132	7.6
Chemistry	17	1.3	32	2
Computer Science	263	20.8	363	21
Comp-Math	13	1	21	1.2
Dual Degree	23	1.8	21	1.2
Math Education	7	0.5	22	1.3
Pre-Pharmacy	30	2.7	12	0.7
Science Education	1	0.07	1	0.05
<b>NATURAL SC. DIVISION</b>	<b>444</b>	<b>35.1%</b>	<b>604</b>	<b>35%</b>
Human Development	80	6.3	116	6.7
International Affairs	18	1.5	22	1.2
Political Science	7	0.5	15	0.9
<b>SOCIAL SC. DIVISION</b>	<b>105</b>	<b>8.3%</b>	<b>153</b>	<b>8.8%</b>
TAFLE	2	0.1	2	0.1
TEFL	21	1.7	30	1.7
<b>APPLIED LANG. DIVISION</b>	<b>23</b>	<b>1.8%</b>	<b>32</b>	<b>1.8%</b>
Communication Arts	48	3.8	69	4
Fine Arts	19	1.5	26	1.5
Interior Design	81	6.4	102	5.9
<b>HUMANITIES DIVISION</b>	<b>148</b>	<b>11.7%</b>	<b>197</b>	<b>11.4%</b>
<b>TOTAL</b>	<b>1264</b>	<b>100%</b>	<b>1732</b>	<b>100%</b>

Source: Statistical Records -Registrar's Office BUC

### Sample Selection and Data Collection

This study is intended to determine the best combination of measures, which will maximally discriminate between successful and unsuccessful students. In this research the sample constitutes of 272 cases from the five divisions at BUC for those students who were admitted in 1986-87, and who are placed on academic probation (whose GPA is below average i.e. below 2.00), and those placed on the Dean's and the Distinguished List (whose GPA is above 3.2) for the year 1987-88. The number of students enrolled in Spring Semester 1987 was 659, out of which 236 (36 percent) were placed on academic probation, and 55 (8.3 percent) were placed on the Dean's and Distinguished List. Those students constitute around forty five percent of the total number of students admitted. What variables discriminate between these two groups i.e. what made those students have a very good performance, and the others have a very poor one. Table VI shows the number of cases studied in each division.

### Selected Variables and their Measurements.

#### The Dependent variable

Academic performance is the dependent variable. Students placed on academic probation are assigned a code of 1, and 0 if placed on the Dean's and Distinguished List.

TABLE VI  
THE SELECTED SUBJECTS OF THE STUDY

PERFORMANCE	BUSINESS	%	NATURAL SC.	%	HUMANITIES	%	SOCIAL SCIENCE	%	APPLIED LANG.	%	TOTAL
PROBATION	113	90	88	79	10	53	7	64	3	60	221
DEAN'S LIST	13	10	23	21	9	47	4	36	2	40	51
TOTAL	126	100%	111	100%	19	100	11	100%	5	100%	272

Source: Statistical Records – Registrar's Office – BUC

### The independent variables

A combination of measures are used to predict the college performance of students. Since some of the variables are dummy variables, a code of 1 or 0 is assigned to them.

- 1- Students coming from a public school are assigned a code of 1, and 0 if coming from a private school.
- 2- Students coming from a school with English Language are assigned a code of 1, and 0 otherwise.
- 3- If the student is given a good or excellent recommendation by the principal of the high school then a code of 1 is assigned, and 0 if he is given a poor or a fair one.
- 4- Students holding a Math certificate are coded 1, and 0 otherwise, the same applies for the other official certificates (Experimental Science, Literary, and Technical Baccalaureate).
- 5- Kind of the government certificate the student has i.e. students passing the official government examinations are coded with 1, and those holding a statement of candidacy are coded with 0.

6- Students desiring the major studied, then a code of 1 is assigned , a code of 0 otherwise.

7- Sex of applicants is coded 1 for male and 0 for female.

8- Average of the student at the high school

9- Score of the Entrance Examination

10- Score of the English Entrance Examination

11- Major of study

Based on logical basis and in addition to those variables, we used interaction between variables. It is believed that interaction between variables is better than simple additive forms, because it is hard to find one or two variables in isolation. The regression model will constitute of the following variables.

$X_1 = \text{Average} * \text{S.Q.}$

$X_2 = \text{Average} * \text{Sex}$

$X_3 = \text{S.Q.} * \text{Sex}$

$X_4 = \text{Recommendation} * \text{Average of High School}$

$X_5 = \text{Recommendation} * \text{Language of High School}$

$X_6 = \text{S.Q.} * \text{Math Certificate}$



X7 = S.Q. \* Kind of Certificate  
X8 = S.Q. \* Literary Certificate  
X9 = S.Q. \* Experimental Sc. Certificate  
X10= S.Q. \* Technical Bacc.  
X11= S.Q. \* Sex \* Average of High School  
X12= EEE \* Language of High School  
X13= S.Q. \* Type of High School  
X14= S.Q. \* Language of High School  
X15= S.Q. \* Average \* Desire  
X16= Average \* Type of Certificate  
X17= S.Q. \* Desire

#### Conceptual Framework for Analyzing the Data

Since we are interested in classifying students ( new applicants) into successful and unsuccessful ones, therefore we used the multiple regression analysis using the Y vector of 1s and 0s as the dependent variable, and the other variables as the independent variables. The Statistical Package for the Social Science (SPSS) was used in analyzing the data.

## CHAPTER IV

### FINDING OF THIS STUDY

To answer the research questions of:

- 1- How can we discriminate between successful and unsuccessful students on the basis of a least square composed of K selected variables?
- 2- What are the major characteristics of the selected students?
- 3- What are the best discriminating variables selected according to their ability to discriminate between successful and unsuccessful students?

Discriminant analysis is used to evaluate the relative weight of the independent variables in predicting Y. From this analysis, we could derive an equation for each division that may help in the admission decision.

#### Business Division

The discriminant regression equation for the Business Division (Appendix B) is:

$$Y = 0.83223 - 0.01959 X16 + 1.12609 \text{ Cert-X5} - 0.000209 X15 + 0.59700 \text{ Desire} + 0.0000699 X11$$

(-5.489)	(4.535)	(-6.673)	(5.257)	(5.815)
S	S	S	S	S

$$R^2 = 0.64438$$

$$F = 43.48808$$

$$\text{Signif. } F = 0.0000$$

From this equation, one can see that the Coefficient of determination  $R^2$  was significant, indicating that 64.43 percent of the variation of the students' performance can be attributed to the estimated effect of the variables in the equation ( X16, Cert-X5, X15, Desire, X11). Where X16 is Average at High School \* Kind of official Certificate, Cert-X5 is whether the student passed official exams or holds a Statement of candidacy, X15 is S.Q. \* Average at High School \* Desire of the student to study the major, and X11 is S.Q. \* Sex \* Average at High School

The coefficient of these variables are the slopes or the bs of the equation, which mean for two students having the same X16 (holding the other variables constant), if X16 changes by one unit, Y will change by -0.01959. The F ratio of 43.49 is significant ( Signifi. F = 0.0000). The numbers in parantheses below, the estimated parameters, are the corresponding T values which are as well significant, as we can see that Significant T is 0.

The Natural Science Division

The discriminant regression equation for the Natural Science division is:

$$Y = 1.32442 - 0.00431544 X_{16} - 0.000180643 X_1 + 0.004071062 X_3 + 0.002473093 X_{13}$$

	(-4.426)	(-4.973)	(2.910)	(2.285)
	S	S	S	S

$$R^2 = 0.44766$$

$$F = 21.47778$$

$$\text{Sig. } F = 0.0$$

From this equation, we see that the coefficient of determination  $R^2$  is significant, 44.76 percent of the variation of  $Y$  is accounted for by the combination of four independent variables ( $X_{16}$ ,  $X_1$ ,  $X_3$ ,  $X_{13}$ ).  $X_{16}$  is Average \* Kind of Certificate,  $X_1$  is the Average at High School \* S.Q.,  $X_3$  is S.Q. \* Sex, and  $X_{13}$  is S.Q. \* whether the High School is private or public.

The  $F$  ratio of 21.47 is significant (Sign.  $F = 0.0$ ). The estimated parameters are the corresponding  $T$  values which are very close to 0. This regression equation is shown to be statistically significant.

### Humanities Division

Two variables constitute the equation of the Humanities Division that would predict the performance of students at the College, and to discriminate between successful and unsuccessful ones. The variables determined in the Business Division have been taken first, second are those of the Natural Science Division, and then the remainder of all the variables from which it is showed that X16 and X10 to be the best predictors for the Humanities Division. The equation is:

$$Y = 1.00455 - 0.01086 X16 + 0.01150 X10$$

(-5.777)                      (2.248)  
S    S

$$R^2 = 0.69215$$

$$F = 17.98$$

$$\text{Sig. } F = 0.0001$$

R<sup>2</sup> is equal to 0.69 or 69 percent of the variations of Y is accounted for by the combination of two independent variables (X16 and X10). X16, as for the two preceding divisions, is Average at High School \* kind of certificate (is it a statement of candidacy or not), and X10 is S.Q. \* Technical Baccalaureate. From this variable we can see that students holding the Technical Bacc. should not be advised to join the Humanities Division. The F ratio 17.98 is significant, as are the corresponding T values. From the F

Ratio, and the T ratio this regression equation is shown to be significant.

#### Social Science Division

For this division, there have been no correlation between the variables that could be used to discriminate between students. The reason is the small number of cases studied (11 cases) which account for four percent of the total number of cases selected. (Table VI)

#### Applied Language Division

All we have from this division is only five cases which cannot be used to calculate a regression equation to predict performance. In addition, the enrollment in this division is very small. As the total enrollment in Spring 1987 for the BA/BS program was 1,732 students, only 32 students are from the Applied Languages Division. This constituted around 1.8 percent of the enrollment in the BA/BS program at BUC.

Table VII gives a Summary of the Discriminant variables used for each division.

TABLE VII  
SUMMARY OF THE DISCRIMINANT VARIABLES BY DIVISION

VARIABLES USED	BUSINESS DIV.	NATURAL SC.DIV	HUMANITIES DIV.
Off.Cert.or Statement (Cert-X5)	1.12609		
Desire	0.59700		
Average * S.Q. (X1)		-0.000180643	
S.Q. * Sex (X3)		0.004071062	
S.Q. * Technical Bacc (X10)			1.00455
S.Q. * Sex * Average (X11)	0.00006997994		
S.Q. * Off. School (X13)		0.002473093	
S.Q. * Average * Desire (X15)	-0.000209472		
Off. Cert. * Average (X16)	-0.01959	-0.00431544	-0.01086

From this review, one can notice that the variable X16 (Official Certificate or a Statement of Candidacy \* Average) is common between the three Divisions. This implies that this variable is important and to be taken into consideration in the admission decision. The variables that have weight in the Business division, and that affect the performance, are the kind of official certificate i.e. students passing the official government examination may have better college performance than those holding a statement of candidacy. The same applies to the Female applicants who have a high S.Q. score, and a good average at school. Desire as well play a role in predicting the college performance of applicants. Those who desire the major they study have the advantage of achieving a better performance at the College than those who did not.

For the Natural Science Division the variables that may affect performance are (as in the Business Division) the kind of certificate the student holds, The sex of applicants (Females have more advantage to achieve better performance than males), S.Q. score, and Average at high school. In addition to those variables the kind of high school from which the students graduate is an important factor in the Natural Science Division. Students graduating from Public Official Schools may not have the same performance as those graduating from private institutitons.



In the Humanities Division the variables that count more are the kind and type of certificate the student holds, the S.Q. score, and the average at high school. Students holding the Technical Baccalaurate or a statement of candidacy may have a poor performance at college.

From this brief summary of the findings, one can see that the kind of certificate along with the S.Q. score and the average at high school (which are common in the three divisions), and the sex are the variables that counted more than the other ones. From the sample we used, it was noticed that out of 221 students, who are on academic probation, 158 students (72 percent) hold the Certificate of Candidacy, and 38 students (28 percent) passed the Official Examinations. The opposite is true for those who are placed on the Dean's and the Distinguished List; 13 students out of 51 (25 percent) hold the Certificate of Candidacy, and 38 (75 percent) passed the Official Government Examinations.

The same applies to the variable Sex. Out of 221 students placed on Academic Probation, 174 (79 percent) are male, and 47 (21 percent) are female, while out of 51 students placed on the Dean's and the Distinguished List 22 (43 percent) are male, and 29 (57 percent) are female which shows the importance of these variables in the study.

TABLE VIII  
 SELECTED SUBJECTS BY SEX  
 AND THE KIND OF CERTIFICATE HELD

VARIABLES	PROBATION	%	DEAN'S	%
FEMALE	47	21	29	57
MALE	174	79	22	43
TOTAL	221	100%	51	100%
PASSING OFF. EXAMS	63	28	38	75
HOLDING STATEMENT	158	72	13	25
TOTAL	221	100%	51	100%

### Testing the Equations

To test the predictive power of these equations, we used them to classify students, not in the selected sample of this study, into successful and unsuccessful ones. Using the equations we expect the predicted  $Y_s$ , derived from these equations, and the students scores, to be close to 0 in the case of students whose achievement is satisfactory, call them Dean's List 'D', and close to 1 in the case of students whose achievement is not satisfactory, call them probation 'P'.

Table IX and Table X show the actual, and the resulting classifications of new data based on forty students who were admitted and enrolled in the Fall 1987, and have been placed on either the Dean's List or on Academic probation for the Spring Semester 1988.

A study of these tables reveals that ten percent of those whose achievement is actually unsatisfactory (P), have been erroneously assigned to D, or have satisfactory predicted achievement based on the equation concluded.

TABLE IX  
 CLASSIFICATION OF NEW ADMITTED APPLICANTS BASED ON THE PREDICTED EQUATIONS  
 (BUSINESS DIVISION)

Y	X16	CERT-X5	X15	DESIRE	X11	BASED ON EQUATION PREDICTED GOOD PERFORMANCE	ACTUAL GROUP ASSIGNMENT
0.68	0	0	3555	I	0	NO	P
0.62	68	I	4283	I	4283	NO	P
0.74	56	I	3416	I	0	NO	P
0.07	80	I	4400	I	0	YES	D
0.90	0	0	3760	I	3760	NO	P
0	73	I	0	0	3869	YES	P
0.82	0	0	4346	I	4346	NO	P
I	0	0	2600	I	I	NO	P
0.93	0	0	3510	I	3510	NO	P
0.63	0	0	3800	I	0	NO	P
I	0	0	2184	I	2184	NO	P
0.91	0	0	3710	I	3710	NO	P
0.10	82	I	4018	I	0	YES	D
0.10	88	I	5127	I	5127	YES	D
0.42	70	I	3290	I	0	YES	P
0.68	0	0	3570	I	0	NO	P
0.96	0	0	3300	I	3300	NO	P
I	56	I	0	0	2632	NO	P
0.48	76	I	4104	I	4104	YES	D
0.21	75	I	4200	I	0	YES	D
I	57	I	3021	I	3021	NO	P

TABLE X  
 CLASSIFICATION OF NEW ADMITTED APPLICANTS BASED ON THE PREDICTED EQUATIONS  
 (NATURAL SC. DIVISION)

Y	X16	X1	X3	X13	BASED ON EQUATION PREDICTED GOOD PERFORMANCE	ACTUAL GROUP ASSIGNMENT
0.91	0	3528	56	0	NO	P
0.75	0	4692	69	0	NO	P
0.38	90	4050	45	0	YES	D
1	0	3366	51	51	NO	P
0.44	75	4401	59	0	NO	P
0.90	45	2520	56	0	NO	P
0.86	0	3828	58	0	NO	P
0.47	75	4125	0	0	YES	P
0.39	89	4984	56	56	YES	D
0.09	95	5320	0	56	YES	D
0.56	67	3886	58	0	NO	P
0.52	80	4640	58	58	NO	P
0.60	0	3705	57	0	NO	P
0.87	0	3249	0	0	NO	P
0.76	0	4368	56	0	NO	P
0.80	49	2352	0	48	NO	P
0.30	77	5390	70	0	YES	D
0.52	0	4420	0	0	NO	D
0.83	60	3240	54	54	NO	P
1	0	3016	52	52	NO	P

## CHAPTER V

### SUMMARY AND CONCLUSION

For the past two years, Beirut University College became overcrowded with students coming from different parts in Lebanon. An increasing large number of applicants are seeking a college education. The volume of applications forces the College either to become more selective, or to accept the additional numbers. Since there are no plans to expand the campus in the near future, the College cannot continue admitting students by the same policy used in the past.

New admissions criteria should be adopted to cope with situation, keeping enrollment to its optimal, and raising standards at the same time.

How should the College choose a few among many young candidates? What variables should be included in the admission decision? This research focuses mainly on the variables that affected the students' performance at the College, so a guide could be derived that may help in the admission decision. A review of the admission process of the College is presented, along with the variables used by the Admissions Committee. Several variables were used as predictors in this research, that were not used by the Committee before. Seventeen different variables, with their interactions were fitted into a regression equation that resulted into equations for three

divisions ( Business Division, Natural Science Division, and Humanities Division). From this study, it is shown that the kind and the type of the certificate the student holds, the Entrance Examination's score, the high school grades, the kind of the secondary school from which students graduated, the students' desire, and the sex of applicants were the variables that have effect on the students' college performance.

This system may ,I hope, help the Admissions Committee in sreening out those students with a poor predicted performance, so better students could be selected with better academic standards. This system represents only a first approach to develop a non-linear predictive admissions system. It provides the advantage of developing a unique score for each individual, based on flexible assignment of weight given to all the variables which make up the individual's profile.

There are many difficulties facing the implementation of such a system, among the most important is the present educational situation Lebanon is passing through, where a lot of inaccuracy is found in the data and grades reported. many questions arise: How valid, reliable, and biased are tests scores, grades, recommendations, and the rest in measuring and predicting various outcomes of interest.

After all, what the Admissions Committee seeks is the objective of selection, differing predictions about the prospects of one candidate versus another.

NICOL HALL

APPENDIX A

```
2. This procedure was completed at 7:41:26 SET PRINTER=ON.
4. DATA LIST FILE='C:\SPSS\NADA.DAT'/SERIAL 1-3 HISC_X1 4
6. HISC_X2 5 RECOM 6 AVERAGE 7-11(2) SQ 12-13 EEE 14-16
8. MAJOR 17-18 CERT_X1 19 CERT_X2 20 CERT_X3 21 CERT_X4 22
10. CERT_X5 23 DESIR 24 SEX 25 PROB 26 DEAN 27
12. VARIABLE LABELS HISC_X1 'STATUS OF SCHOOL'
14. /HISC_X2 'LANGUAGE OF SCHOOL'
16. /RECOM 'RECOMMENDATION'
18. /AVERAGE 'HIGH SCHOOL AVERAGE'
20. /SQ 'SQ'/EEE 'EEE'/MAJOR 'MAJOR'
22. /CERT_X1 'MATH'/CERT_X2 'EXP SCIENCE'
24. /CERT_X3 'LITTERARY'/CERT_X4 'B.T'
26. /CERT_X5 'KIND OF CERTIFICATE'/DESIR 'DESIR'/SEX 'SEX'
28. /PROB 'PROBATION'/DEAN 'DEAN LIST'.
30. VALUE LABELS HISC_X1 1 'PUBLIC' 0 'PRIVATE'
32. /HISC_X2 1 'ENGLISH SPEAK' 0 'OTHERS'
34. /RECOM 1 'GOOD' 0 'POOR'
36. /MAJOR 1 'BIO/CHEMISTRY' 2 'BUSINESS'
38. 3 'BUS/COMPUTER' 4 'CHEMISTRY' 5 'COMMUNICATION ARTS'
40. 6 'COMPUTER SCIENCE' 7 'COMPUTER MATH' 8 'DUAL DEGREE'
42. 9 'FINE ARTS' 10 'GENERAL SCIENCE' 11 'HUMAN DEVLPT'
44. 12 'INTERIOR DESIGN' 13 'INT AFFAIRS' 14 'MATH'
46. 15 'PRE-PHARMACY' 16 'TEFL'
48. /CERT_X1 1 'MATH' 0 'OTHER'
50. /CERT_X2 1 'EXP SC' 0 'OTHER'
52. /CERT_X3 1 'LITTERARY' 0 'OTHER'
54. /CERT_X4 1 'B.T' 0 'OTHER'
56. /CERT_X5 1 'OFFICIAL' 0 'NOT OFFICIAL'
58. /DESIR 1 'YES' 0 'NO'
60. /SEX 1 'MALE' 0 'FEMALE'
62. /PROB 1 'ON PROBATION' 0 'NOT ON'
64. /DEAN 1 'ON' 0 'NOT ON'.
66. recode major (2,3=20).
68. recode major (1,4,6,7,8,10,14,15=21).
70. recode major (5,9,12=22).
72. recode major (11,13=23).
74. recode major (16=24).
76. process if (major EQ 22).
78. compute x1 = average * sq.
80. compute x2 = average * sex.
82. compute x3 = sq * sex.
84. compute x4 = recom * average.
86. compute x5 = recom * hisc_x2.
88. compute x6 = sq * cert_x1.
90. compute x7 = cert_x5 * sq.
92. compute x8 = sq * cert_x3.
94. compute x9 = sq * cert_x2.
96. compute x10 = sq * cert_x4.
98. compute x11 = sq * sex * average.
100. compute x12 = hisc_x2 * EEE.
102. compute x13 = hisc_x1 * SQ.
104. compute x14 = hisc_x2 * SQ.
106. compute x15 = sq * average * desir.
108. COMPUTE x16 = CERT_X5 * AVERAGE.
110. compute x17 = DESIR * SQ.
112. SAVE OUTFILE = 'NADA.SYS'.
114. GET FILE = 'NADA.SYS'.
116. regression var=hisc_x1 to EEE CERT_X1 TO PROB
118. X1 TO X17/DEPENDENT#PROB
120. /METHOD=STEPWISE/RESIDUALS=OUTLIERS.
```

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38 Multiple R .00273  
 R Square .64438  
 40 Adjusted R Square .62956  
 Standard Error .18588

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Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	5	7.51267	1.50253
Residual	120	4.14606	.03455

48 F = 43.48808 Signif F = .0000

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\*\*\*\*\* MULTIPLE REGRESSION \*\*\*\*\*

54 Equation Number 1 Dependent Variable.. PROB PROBATION

Variables in the Equation

Variable	B	SE B	Beta	T	Sig T
X16	-.01959	3.56663E-03	-.201480	-5.489	.0000
CERT_X5	1.12609	.24933	1.64322	4.535	.0000
X15	-2.09472E-04	3.13896E-05	-.124553	-6.673	.0000
DESIR	.59700	.11356	.96334	5.257	.0000
X11	6.997994E-05	1.20346E-05	.33203	5.815	.0000
(Constant)	.83223	.04615		18.032	.0000

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\*\*\*\*\* MULTIPLE REGRESSION \*\*\*\*\*

6 Equation Number 1 Dependent Variable.. PROB PROBATION

Variables not in the Equation

Variable	Beta In	Partial	Min ToIer	T	Sig T
HISC_X1	-.01317	-.02142	.02193	-.234	.8156
HISC_X2	-6.403E-04	-.00105	.02167	-.011	.9909
RECOM	.09987	.16258	.02113	1.797	.0748
AVERAGE	.05281	.06794	.01781	.743	.4590
SO	-.03689	-.04852	.02109	-.530	.5971
EEE	.04778	.07653	.02182	.837	.4041
CERT_X1	-.03605	-.05935	.02166	-.649	.5179
CERT_X2	3.9166E-03	.00641	.02199	.070	.9444
CERT_X3	.03254	.05327	.02143	.582	.5617
CERT_X4	.03217	.05363	.02175	.586	.5591
SEX	-.04196	-.03034	.02128	-.331	.7412
X1	-.02276	-.02419	.02108	-.264	.7923
X2	.05800	.03700	.02189	.404	.6870
X3	-.14168	-.06140	.01844	-.671	.5035
X4	.09794	.15845	.02091	1.751	.0826

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\*\*\*\*\* MULTIPLE REGRESSION \*\*\*\*\*

34 Equation Number 1 Dependent Variable.. PROB PROBATION

Variables not in the Equation

Variable	Beta In	Partial	Min ToIer	T	Sig T
X5	.09629	.15869	.02196	1.753	.0821
X6	-.03924	-.06405	.02166	-.700	.4852
X7	-.38976	-.10458	.01032	-1.147	.2536
X8	.02953	.04773	.02111	.521	.6031
X9	-3.572E-03	-.00584	.02200	-.064	.9493
X10	.03487	.05792	.02169	.633	.5280
X12	2.8382E-03	.00469	.02172	.051	.9593
X13	-.01332	-.02145	.02190	-.234	.8154
X14	-7.933E-03	-.01311	.02152	-.143	.8865
X17	-.13147	-.03772	.01925	-.412	.6813

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Multiple R .83196  
R Square .69215  
Adjusted R Square .65367  
Standard Error .30189

HUMANITIES DIVISION

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	18.27861	1.63931
Residual	16	1.45823	.09114

F = 17.98685      Signif F = .0001

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\*\*\* MULTIPLE REGRESSION \*\*\*

Equation Number 1    Dependent Variable..    PROB    PROBATION

*Pt*

Variables in the Equation

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Variable

Variable	Beta	SE Beta	Beta In	T	Sig T
X16	.01086	1.88043E-03	.80640	-5.777	.0000
X10	.01150	5.11675E-03	.31376	2.248	.0390
(Constant)	1.00455	.11265		8.917	.0000

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\*\*\* MULTIPLE REGRESSION \*\*\*

Equation Number 1    Dependent Variable..    PROB    PROBATION

Variables not in the Equation

Variable

Variable	Beta In	Partial	Min Toler	T	Sig T
HISC_X1	-4.603E-03	-.00627	.57119	-.024	.9809
HISC_X2	.11660	.20891	.97813	.827	.4210
RECOM	.23734	.42212	.96796	1.803	.0914
AVERAGE	-.02992	-.04384	.66095	-.170	.8673
SO	.19773	.23665	.44094	.943	.3605
EEE	-.13795	-.22196	.79695	-.882	.3919
CERT_X1	-.09231	-.15668	.88157	-.614	.5482
CERT_X2	.22601	.36703	.81185	1.528	.1473
CERT_X3	-.11227	-.19743	.95198	-.780	.4475
CERT_X4	-.50000	-.00000	0.0	0.000	1.0000
CERT_X5	.17384	.06268	.04002	.243	.8111
DESIR	.10574	.18081	.89821	.712	.4874
SEX	-2.363E-03	-.00406	.90000	-.016	.9877
X1	.08296	.10039	.44512	.391	.6915
X2	-2.363E-03	-.00406	.90000	-.016	.9877

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\*\*\* MULTIPLE REGRESSION \*\*\*

Equation Number 1    Dependent Variable..    PROB    PROBATION

Variables not in the Equation

Variable

Variable	Beta In	Partial	Min Toler	T	Sig T
X3	-2.363E-03	-.00406	.90000	-.016	.9877
X4	.17100	.30482	.96600	1.240	.2342
X5	.25219	.44971	.97306	1.950	.0701
X6	-.09087	-.15416	.88083	-.604	.5547
X7	.96169	.33749	.03791	1.389	.1852
X8	-.10977	-.17797	.80925	-.700	.4944
X9	.25233	.41804	.84497	1.782	.0950
X11	-2.363E-03	-.00406	.90000	-.016	.9877
X12	.10424	.18606	.97830	.733	.4746
X13	-5.138E-03	-.00625	.45577	-.024	.9810
X14	.14463	.25930	.97773	1.040	.3149
X15	.15695	.21146	.55383	.838	.4152
X17	.18950	.27810	.67009	1.121	.2798

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\*\*\* MULTIPLE REGRESSION \*\*\*

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