SOME ALTERNATIVE PREDICTORS OF FRESHMAN GPA ALONG WITH THE ESLCE IN ETHIOPIAN INSTITUTIONS OF HIGHER LEARNING*

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ABSTRACT: *The issue of student selection for higher education in Ethiopia remains to be a subject of scientific inquiry despite the various attempts of researchers to tackle the problem. This paper is a further attempt to shade light on this pressing issue. More specifically, it is designed to (1) assess the predictive validity of the existing admission criterion (i.e. ESLCE GPA), (2) explore other possible potent predictors of achievement and aptitude, (3) find out if there is a need to fit separate regression equation for the various faculties, and (4) determine the effect of certain background variables on the selected predictors for inclusion in the regression equation. Subjects of the study include 256 randomly selected freshman students from the three faculties of AAU (Medicine, Natural Science, and Social Science) and Alemaya Agricultural University in 1991. The analysis is carried out using the correlation and regression models along with other descriptive and inferential statistical techniques. Results show that three alternative measures have significant predictive power with differing weights across faculties, the two sexes, and the place high school is attended. Implications are discussed and suggestion are given.*

1. BACKGROUND TO THE PROBLEM

It is almost half a century since the Ethiopian School Leaving Certificate Examination (ESLCE) has been put for use as a sole criterion for student admission into institutions of higher learning in Ethiopia.   In due course, quite many investigations have been conducted to find out the extent to which this instrument has served its intended purpose.   Survey of available literature, however, is more indicative of the ESLCE's research generative capability than suggesting some conclusive evidence as regards its predictive value (Bhalla and Belay, 1991).

It is not in fact uncommon to find researchers in the field   voicing dissatisfaction with the exclusive use of the ESLCE as an admission instrument[*]. Such dissatisfaction has gone to the extent of opting for an assessment of some other alternative measures (e.g. Bhalla and Belay, 1991; Lehitenen, 1991) for possible use in student selection.

As a matter of fact, some researchers have attempted to respond to suggestions like the above. While, for example, Makonnen et al. (1991) made a preliminary investigation on the comparability of the predictive power of the ESLCE with other measures (e.g. a locally prepared aptitude test) in the Social Science and Natural Science faculties of the Addis Ababa University, Kebede (1991) approached the issue using the Scholastic Aptitude sub-score of the Differential Aptitude Test (DAT) and high school scores. Dejene (1990) was even

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- Readers are referred to Bhalla and Belay (1991) for a critical review of most of these studies, Makonnen et al (1991) also provide an excellent review of the studies.

more specific about the issue. Being Cognizant of the current ESLCE English language examination in accomplishing its two main tasks (i.e., that of certifying completion of secondary school English and screening promising students for university education), he attempted to examine ways of improving the problems associated with the test. He set a new examination comprising two parts, each of which was intended to be geared to each of the two tasks of the ESLCE English. He found out that the achievement part of the new exam was better than the currently used one both as an achievement and a proficiency test whereas the second part was found to be better at predicting University performance.

Despite such and other related attempts, the issue of student selection for higher education in Ethiopia is not yet settled and still demands a further research undertaking. For one thing, what specific instruments should be considered in designing a sound admission program is not yet established. For another, no adequate treatment has been made so far to compare and contrast the relative importance of the already studied alternative measures of aptitude and achievement for predicting academic success in different colleges and/or faculties.

An equally important issue is that no attempt has also been made to see if there is a need for using different criteria for admitting, for example, male and female applicants, and applicants from urban and rural centers as well. It is to be noted, however, that the Department of Higher Education gives a kind of consideration for these issues during admission. Moreover, some research evidences also show that academic performance is partly a function of sex (Belay, 1990) in primary teacher training institutions of Ethiopia, the place high school is attended (Asmerom et al., 1989) and that there are variations in performance across different faculties of AAU requiring different

ESLCE GPA for admission (Asmerom et al., 1989; Mittman, 1972). Implicit in these findings is that there is a need for fitting a separate regression model for the various colleges and/or faculties.

In the light of these issues, this paper, therefore, aims at making an assessment of the predictive power of the ESLCE GPA along with other alternative cognitive measures using students in different colleges/faculties and tries to determine how far these predictors are independent of the effect of such background factors as sex and the place high school is attended. As to the alternative measures to be considered, it is indicated under the statement of the problem.

2. STATEMENT OF THE PROBLEM

It is appropriate to mention at this point some general suggestions that underlie any final choice of a predictor variable before proposing alternative predictors for assessment.

The first consideration is that "the cost of selection process must be subtracted from any test produced gain in utility" (Hills, 1971: 687). The implication is that, other things being constant, the greatest gain in utility can be obtained by using the least expensive measures that yield comparable results. Furthermore, if useful predictions can be made from data that are collected for some other purpose and therefore add nothing additional to costs, such data have the potential of providing appreciable net gain.

The second fundamental idea is based on the fact that predictors can't be considered in isolation from each other. It is suggested that if one starts out with a readily available predictor of some validity, then an additional measure has value only to the extent that it adds validity beyond that provided by the initial predictor, and each additional measure must be evaluated by its ability to improve upon the existing predictive measures i.e., by its incremental validity (Sechrest, 1963).

In the light of the above suggestions, consideration is given in this paper to two kinds of alternative measures that are often used in some other educational selection.

One such measure is high school academic score which is a readily available record of previous academic work. Despite problems of incomparability of the high school academic score of students across different schools, such measure of achievement has some advantages over the ESLCE in addition to issues of utility and validity suggested above. Firstly, it is based on tests prepared by classroom teachers themselves who are believed to know the high school curriculum and the learners as well than the ESLCE whose construction does hardly involve the classroom teachers. Secondly, studies have shown that the record of performance in high school is the most single predictor of college performance (Hills, 1964). Evidences still exist in recent years uncovering the incremental validity of the high school score in Ethiopia (e.g. Kebede, 1991, Makonnen et al., 1991; Tassew et al., 1990).

The second potential predictor to be considered for investigation is an aptitude test. Because student selection basically involves prediction of future success, it is theoretically justifiable to employ some kind of aptitude measures. The need for aptitude measures is also envisaged when looking at some early predictive studies of college success in

Ethiopia (Lakew, 1972; Mittman, 1972) which lend support to the use of aptitude tests for admission. Makonnen et al (1991) had recently used a locally prepared 90-item aptitude test and found it to be a strong predictor.

In view of the need for aptitude measurement, consideration is given in this paper to one of the most widely used sets of standardized tests having a relatively longer history of use in some other countries, i.e., the Differential Aptitude Tests (DATs). It appeared first in 1947 and revised consecutively in 1952 and 1957. DATs were developed to provide an integrated, scientific and well-standardized procedure for measuring the abilities of boys and girls in grades 8 through 12 for purposes of educational and vocational guidance and selection (Bennett et al., 1959: 1). They were developed as an integrated battery consisting of eight sub tests. The tests have been accorded the most gratifying acceptance by reviewers and users alike. Hundreds of research findings prove that DATs are really very strong tests in serving their intended purposes.

An assessment of already available measure of aptitude like the DAT may prove to serve a purpose and in so doing can minimize costs involved in constructing new measures. Hence, it is justifiable to examine the role of the DAT than designing a new measure of aptitude test. There is in fact a recent evidence showing that the predictive value of the DAT is substantial even in the Ethiopian context (Kebede, 1991).

With these issues in mind, the present paper aims at answering the following basic questions.

1. What proportion of University GPA variance is explained in terms of the ESLCE?

2. What is the incremental validity of the:
    (a) Previous high school score?
    (b) Differential Aptitude Test scores (DAT)?

3. Do these predictors need to be differently weighted for the different institutions?

4. Is there a significant difference between the two sexes on the above predictors?

5. Are the above potential predictors influenced by the place at which high school is attended?[*]

In a nut-shell, this paper is designed to (a) assess the predictive value of the existing admission criterion on a larger scale, (b) explore the role of other measures in prediction, (c) find out if there is a need for separate regression model for the various faculties and/or colleges using the first semester freshman GPA as a criterion and (d) determine the effect of sex and place of high school attendance on the predictor variables which are selected for the purpose of prediction.

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[*] See the definition given under "Variable designation"

3. METHODOLOGY

Methods and procedures of sampling, data collection, and analysis used in this predictive study are discussed in this section. The designation of variables used throughout the paper are also discussed.

3.1. subjects

Those institutions of higher learning in Ethiopia which, in addition to other programs, have been and still are offering Bachelor degrees in different faculties were the sources of sampling. These institutions are Alemaya Agricultural University and Addis Ababa University. From the Addis Ababa University, consideration is given to the faculties of Natural Science, Social Science, and Medicine because unlike the Alemaya Agricultural University, the various faculties of the Addis Ababa University run their own freshman programs independently having applicants directly assigned to them by the Department of Higher Education (MOE).

Accordingly, freshman (regular) students of these institutions in the year this research was undertaken (i.e., 1991) constitute the target population. Almost 19% of the target population were found to have complete information on ESLCE GPA and the place high school was attended and hence were originally selected from each faculty. But, out of this percentage, students who completed their secondary education before 1982 E.C (and hence were non-regular applicants) and those others who were readmitted cases were excluded from the study. The remaining 256 students out of the 19% target population were, therefore, considered as subjects of the study; 47 being from Medicine,

94 from Natural Science, 54 from Social Science, and 61 from Alemaya.

The sample size is generally decided based on the procedure that about ten complete sets of observations are roughly sufficient for each category of a certain potential predictor variable (Draper & Smith, 1981: 417). There are three predictor variables in this study each consisting of at least two categories (i.e., sex, the place high school is attended, and faculty) with a total of 16 categories (i.e., 2x2x4 categories) implying that a sample size of at least 160 (i.e., 16x10) could even suffice for the purpose at hand. Our sample size (i.e. 256 students) is, therefore, quite satisfactory.

3.2. Variable Designation

Below is given a specification, definition or designation of the variables used in the study.

X_{01} = ESLCE GPA (an average of grades on five subjects grades in Maths and English and three more subjects on which the student had better grades)

X_{10} = High school academic score being represented by the 12th grade class rank as reported by the student himself/herself.

X_{24} = DAT score - Mechanical Reasoning
X_{25} = DAT score - Numerical Ability
X_{26} = DAT score - Verbal Reasoning
X_{27} = DAT score - Spatial Reasoning
X_{28} = DAT score - Arithmetic Reasoning

A method of dummy coding (Kerlinger & Pedhazur, 1973: 102) is employed for recording subjects' sex and the place high school was attended using 1's and 0's where "1" indicates membership and "0" indicates non membership in one of the categories of the variable as follows:

X_{13} = Sex (=1, if male, =0, if female)
X_{14} = place high school was attended (=1, if urban or Addis Ababa, = 0, if rural or outside Addis Ababa)

Institutional membership, on the other, is coded as follows:

X_{19} = Students' faculty (=M, if Medicine, = N, if Natural Science, = S, if social science, = A, if Alemaya)

The criterion variable to be used for validation is the first semester freshman GPA represented as:

Y= first semester freshman Grade Point Average (GPA).

3.3. Procedure of Data Collection

Data on ESLCE GPA and the place high school was attended was obtained from subjects' personal file in the respective faculties. On the other hand, student subjects' verbal report of their class rank in the 12th grade academic performance is used to represent high school academic score because of lack of access to academic records. Researchers suggest that in the face of difficulties of obtaining achievement data directly from school records, it is meaningful to use grade 12 reported results (e.g., Makonnen et al., 1991).

As to the DAT scores, five sub-tests of the 1959 version were administered to subjects immediately after a month of their first semester registration. Both the administration and scoring were generally based on the manual (Bennett, et al., 1959; 13-19).

3.4. Method and procedure of analysis

The procedure of analysis was that the mean and standard deviation were determined at the beginning to show the general characteristics of the data. This was followed by an analysis of the relationship of variables.

After identifying the predictor variables having significant correlation with the criterion, a regression equation was fitted for all observations. The stepwise variant of regression analysis was employed in this case to determine the independent contribution of those predictors which prove to have a significant correlation with the criterion.

An attempt was then made to fit separate regression equations for the four different faculties. This was followed by an examination of the extent of comparability of these lines using a predictor which is found to make a significant improvement in the multiple correlation in all faculties. Test of comparability was made using slopes, elevations, and residual mean squares. The residual mean squares were compared by Bartlett's (1937) test for more than two categories. Test of slopes and elevations were made using the general procedure outlined by Snedecor and Cochran (1967: 433-436). If any one of such tests shows a significant difference, then it is taken to signify that the regression lines are incomparable.

Finally, further analysis was carried out using significant predictors of the criterion in all faculties to see how far they are subject to the effect of such background variables as sex and the place high school is attended using a test of mean differences between two independent samples.

4. FINDINGS

With the purpose of showing the general feature of the data on each variable, such descriptive statistics as the mean and the standard deviation are presented in Table 1.

As can be seen from the table, the mean ESLCE GPA (X_{01}) is 3.45 with a standard deviation (SX_{01}) of .37. The mean high school academic rank (X_{10}), on the other, is 38.57 — the median being 41 - and the standard deviation (Sx_{10}) is 6.32. The mean (y) and standard deviation (S_y) of first semester freshman GPA are 2.28 and .92 respectively. The means of DAT sub scores are found between 11 and 25 and the standard deviations lie between 4 and 19.

It can be said from the above analysis that the DAT sub scores tend to show higher variation than others. This is especially clear when comparison is made between variables in terms of their respective coefficient of variation.

As to the dummy variables, it is clear that each of them is coded to represent two categories, those with values of 1, and 0.

Table 1: Mean and Standard Deviation on Each Variable   (N = 256)

Variables		Values		Coefficient
		Mean	Std.Dev.	of Variation
ESLCE GPA (X_{01})		3.45	.37	10.72
High School Score (X_{10})		38.57	6.32	16.39
Place high school attended (X_{14})		.26	.44	169.23
Sex (X_{13})		.82	.38	46.34
DAT Scores	. Mechanical (X_{24})	19.87	12.37	62.26
	. Numerical (X_{25})	24.37	9.84	40.38
	. Verbal (X_{27})	11.49	5.40	47.00
	. Arithmetic (X_{28})	22.14	20.25	91.46
Freshman GPA (Y)		2.28	.92	10.35

The mean corresponding to each variable, therefore, represents the proportion of cases in the category where the variable has a value of unity. In the light of this, Table 1 shows that 82% of the student subjects are males and 18% are females. Similarly, 26% of students are from Addis Ababa high schools and the remaining 74% are from schools located outside Addis Ababa.

The standard deviations of X_{13} (sex) and X_{14} (the place high school is attended) show that they have a comparable proportion of cases in the two categories.

In relation to faculty (X_{19}), it is indicated under the methodology section that out of the total 256 cases, 18.36% are from the Faculty of

Medicine, 36.72% are from Natural Science, 21.09% are from social Science, and the remaining 23.82% are from Alemaya.

It is now time to pass on to the correlation analysis which is depicted in Table 2. Note that students' Faculty (X_{19}) can't be included in the correlation matrix. Note also that the correlation of dummy variables with others is to be analyzed later on.

Table 2: The Correlation Matrix (N-256)

	X_{01}	X_{10}	X_{13}	X_{14}	X_{24}	X_{25}	X_{26}	X_{27}	X_{28}	Y
.ESLCE GPA (X_{01})	-									
.High School Score (X_{10})	.25	-								
.Sex (X_{13})	.06	.23	-							
.Place high school attended (X_{14})	.17*	.07	.09	-						
.DAT - Mechanical (X_{24})	.36	.32	.30	.24	-					
.DAT - Numerical (X_{25})	.33	.46	.26	.29	.56	-				
.DAT - Verbal (X_{26})	.32	.40	.17	.30	.56	.68	-			
.DAT - Spatial (X_{27})	.26	.20	.11	.30	.68	.50	.50	-		
.DAT - Arithmetic (X_{28})	.27	.42	.27	.26	.62	.71	.63	.60	-	
Freshman GPA (Y)	.35	.49	.26	.25	.51	.71	.68	.43	.59	-

$.p<.01$

The test of significance of the correlation indices yields, as shown in table 2, that the correlation value which is as low as 0.17 is significant at 1% level. Accordingly, the correlation of all variables with the criterion is significant and in fact positive. The same is true of the correlation of DAT sub-scores with other variables. There is a very strong correlation among the five DAT scores.

As can be seen in Table 2, there is in general a significant inter-predictor correlation. Hence, in order to maximize prediction, this

interdependence has to be partialed out or statistically controlled such that each predictor can be tested for the significance of its independent contribution. The implication is that there is a need to use a model

which accommodates two or more variables and thereby shows the independent contribution to the overall multiple correlation of each predictor being selected for inclusion in the model. The linear regression model, more specifically, the stepwise variant of the regression model, is used for this purpose. The summary of such regression analysis is indicated in Table 3.

Table 3: Summary of the Stepwise Regression Analysis (N = 256)

Step	Variable ente.ed		Multiple R2	Beta, Stand weight	Final F to delete
1	ESLCE GPA	(X_{01})	.123	.0135	.080
2	High school score	(X_{10})	.296	.1599	13.403*
3	DAT - Mechanical	(X_{24})	.398	.0285	.232
4	DAT - Numerical	(X_{25})	.558	.3019	23.350*
5	DAT - Verbal	(X_{26})	.608	.3219	34.068*
6	DAT - Spatial	(X_{27})	.608	.0053	.009
7	DAT - Arithmetic	(X_{28})	.608	.0364	.347

It must be noted at this level that the order of selection of potential predictors for inclusion in the model is not based on the partial regression weights. It is rather deliberately controlled so as to see the incremental validity of the alternative measures beyond and above the ESLCE GPA (X_{01}).

As can be seen in Table 3, about 61% of the GPA variance is explained by the inclusion of the seven predictors. But, the last two predictors DAT - Spatial and Arithmetic $(X_{27}$ and $X_{28})$ contribute the least to the explained variance. Moreover, although ESLCE GPA (X_{01}) explains about 12.3% of the variance in Freshman GPA (Y), its standardized weight and the F ratio deleted at the final step show that it does not have a significant independent contribution. The same is true of DAT-Mechanical - (X_{24}).

Reference to the F-deleted ratios shows that it is only High School score (X_{10}), DAT-Numerical (X_{25}) and DAT-Verbal (X_{26}) which make a significant independent contribution in predicting Y. Looking at their respective weights, it is evident that the standardized weights of both X_{25} and X_{26} are twice that of X_{10}. In fact, the standardized weights of others is close to zero which suggests again that their predictive power is not significant.

The next analysis is a further treatment of the predictive power of the variables for the four faculties separately. Table 4 presents a summary of the results of such separate regression analysis.

Table 4: Summary of Regression Analysis for the Faculty of Medicine (M), Natural Science (NS) Social Science (S) and Alemaya (A)

Step	Variable entered	Multiple R^2				Beta, Stand, Mt.				Final F to delete				Significant at 5%			
		M	N	S	A	M	N	S	A	M	N	S	A	M	N	S	A
1	X_{01}	.000	.010	.020	.005	.0474	.1029	.0456	.0395	.104	1.836	.254	.342	-			
2	X_{10}	.067	.121	.210	.170	.0184	.2229	.1767	.0009	.018	8.384	3.271	000	-	*		
3	X_{24}	.109	.231	.225	.471	.1343	.1705	.0282	.2148	.498	3.083	.074	5.111	-			*
4	X_{25}	.218	.493	.548	.718	.2881	.4527	.2974	.4173	2.319	27.940	4.36	16.145	-	*	*	*
5	X_{26}	.270	.542	.655	.764	.2632	.2673	.4216	.2665	3.228	9.458	11.161	8.212				
6	X_{27}	.310	.542	.655	.771	.0588	.0338	.0247	.0887	1.739	.119	0.050	1.009				
7	X_{28}	.311	.544	.660	776	.0425	.0682	.1195	970	.048	.444	.661	1.101	-			

*P<.05

The total accountable GPA variances for the Faculty of Medicine (M), Natural science (N) , Social Science (S), and Alemaya (A) are 31.1%, 54.4%, 66%, and 77.6% respectively. As regards the independent contribution of predictors in each faculty, none is found for Medicine. Both X_{25} and X_{26} are significant for the remaining three faculties. Predictors X_{10} and X_{24} are still significant for Natural science and Alemaya respectively.

Test of comparability of the four regression lines being carried out using X_{26} yields, as indicated in Table 5, that the residual mean square ($x^2 = 38.96$, df $= 3$; P $< .05$), slopes (F$=10.91$; df$= 3.248$; p$<.05$) and elevations (F$=29$; df $= 3. 259$; P$<.05$) do differ significantly.

Although this analysis is limited to X_{26}, the findings can be fairly extended to the remaining significant predictors because they some how share comparable features.

Table 5: Comparison of Regression Lines Developed Separately by Faculty (Variable X_{16} being Considered)

Groups	Deviations from Regression		
	df	SS	MS
M	45	14.23	.31
N	92	27.42	.30
S	52	25.12	.40
A	59	64.99	1.10
	248	131.72	.53
Pooled, W	251	149.07	.59
Differences between slopes	3	17.28	5.78
Between, B	-	-	-
W + B	254	183.36	-
Between adjusted Means	3	51.84	17.28

Differences between slopes: F$= 5.787/.53 = 10.91$;
$F_{(3,248)}$ at 5% is significant
Elevations: F $= 17.28/.59 = 29.29$; $F_{(3,259)}$ at 5% is significant

It has been shown so far that high school score (X_{10}), DAT - Numerical (X_{25}) and DAT- Verbal (X_{26}) are predictors with significant incremental validity atios although their relative weight varies from faculty to faculty. The question still remains as to how far they are related to

such background variables as sex (X_{13}) and the place high school was attended (X_{14}).

The correlation matrix already presented in Table 2 shows that sex (X_{13}) has a significant correlation, among others, with each of the three predictors: X_{10}, X_{25} and X_{26}. In connection to this, it must be noted that testing the significance of the correlation of a dummy variable like sex with a continuous variable like X_{10} or X_{25} or X_{26} is just like testing the significance of mean differences between the two categories of a dummy variable on the continuous variable. A positive and significant correlation suggests that the category represented by "1" has a significantly higher mean score than the category represented by "0" on the correlated variable. Hence, there is a significant mean score difference between males and females on X_{10}, X_{25}, and X_{26}. such that males have higher mean scores than females on each of these three predictor variables. In fact, the finding in this research that males outperform females on DAT-verbal (X_{26}) is contradictory to the existing body of knowledge on females' superiority over males on verbal fluency. Further research has to be carried out to come up with possible explanatory variables.

Following the same analogy, it can be said in connection to the place high school was attended (X_{14}) that students from Addis Ababa high schools do have a significantly higher mean scores than their counterpart on DAT-Numerical (X_{25}) and DAT-Verbal (X_{26})- not of course on X_{10}. This is still contrary to Asmerom's et al (1989) finding that students outside Addis Ababa high schools succeed in college than the Addis Ababa group. There is of course a difference in the validation criterion used in the two findings. Even then it requires further investigation.

Lack of significant difference between the two groups on X_{10} shows, on the other hand, that the high school scores have the quality of comparability across the two types of schools.

5. DISCUSSION

The preceding analysis generally uncovers that of all the potential predictors, it is the DAT - Numerical (X_{25}) and DAT - verbal (X_{26}) which are at the top of the predictive power. Looking at thé DAT Manual, these sub-tests, when used in combination, constitute what is known as the Scholastic Aptitude Test (SAT); a test which is described in the manual as an index of college success. Of course there are many other Scholastic research evidences in Ethiopia (Kebede, 1991) and elsewhere (e.g. Hills, 1964; Horest, 1966) showing that SAT has a significant contribution in predicting college success. The implication is that using SAT in Ethiopia is really justifiable.

The analysis of results in the present paper also suggests that using high school academic rank (X_{10}) together with the above two sub-scores of the DAT indeed maximizes prediction. This is in tune with some research findings pointing to the fact that the high school record and aptitude test scores together constitute a very robust predictor set (e.g. Hills, et al., 1967).

An important point worth mentioning about these significant predictors is that, they seem to have different weight. This is observed not only when regression equation is fitted for the total observation but also when separate regression analysis is made for the four faculties separately. As regards the latter, no predictor is found to explain GPA

variance in the Faculty of Medicine implying the need for a re-examination of some other alternative predictors. Another implication to be drawn in relation to observed differences in standardized weights of the predictors is that, if admission into institutes of higher learning in Ethiopia is made using the High school score (X_{10}), DAT - Numerical (X_{25}) and DAT-Verbal (X_{26}), then due consideration must be given to their differing weights.

One more point needs to be spelled out in relation to the above issues. Differences between the two sexes on X_{10}, X_{25}, and X_{26} scores imply that if these predictors are to be used as criteria for admitting students into colleges and universities, then different scores must be expected of males and females during admission, as it is the case today for ESLCE GPA. The same argument can be extended to the place high school is attended (X_{14}). If DAT - numerical (X_{25}) and DAT-verbal (X_{26}) are to be used for admission purposes, different scores must be expected for students coming from Addis Ababa high school and outside Addis Ababa. Of course, the two groups are more or less comparable on high school academic rank (X_{10}) suggesting that, as opposed to the commonly held belief that high school scores fail to compare across schools, this variable has indeed an "external currency". That is, the same "cut-off" score can be used for students coming from the two school types on X_{10} during admission.

6. CONCLUSION

By way of summarizing the results, below are given the major findings
or conclusions of the study:

1. ESLCE GPA (X_{01}), DAT - Mechanical Reasoning score
   (X_{24}), DAT - Spatial Reasoning score (X_{27}) and DAT-
   Arithmetic Reasoning score (X_{28}) do not predict first
   semester freshman GPA.
2. Twelfth grade class rank (X_{10}) DAT-Numerical Ability
   score (X_{25}), and DAT-Verbal Reasoning score (X_{26}) on the
   other hand, do significantly predict first semester freshman
   GPA (Y).
3. The weights of predictors differ across the faculties.
4. No predictor is found to significantly predict first semester
   freshman GPA(Y) in the Faculty of Medicine.
5. Males and females have significant mean score differences
   on the Twelfth Grade class rank (X_{10}), DAT-Numerical (X_{25})
   and DAT-verbal (X_{26}) such that males out perform females
   on all of the three predictors.
6. There is a significant mean difference between students
   coming from Addis Ababa high schools and students from
   outside Addis Ababa on DAT-verbal (X_{26}) and DAT-
   Numerical (X_{25}) scores. On both variables, the Addis Ababa
   group excels its counterpart. In fact, no difference is
   observed in relation to the 12th grade reported class
   rank(X_{10})

At last, it has to be stressed that the above conclusions can be
considered to be valid on many grounds. Firstly, test of the assumptions
of the correlation and regression models shows that the basic

assumptions are tenable and hence the models are appropriate for analyzing the data*. Secondly, the sample size taken from each faculty is adequate. And thirdly, the administration of DAT was carefully made following the procedures outlined in the manual.

In sum, it can be recommended from the above findings that admission policy makers should give a second thought to their faith in ESLCE as an admission test and rather begin to involve some aptitude measures like the DAT, particularly the SAT. However, it has to be noted that selecting students for the Faculty of Medicine using criteria commonly employed for other faculties is not defensible. Moreover, it has to be recalled that contextualization of the DAT may even add strength to their predictive power. Hence, future research should address on contexualizing the DAT before decisions are reached regarding the use of DAT/SAT as an admission instrument. In fact, further research is still needed to (1) resolve the contradictory findings of the present research and the previous one's (an example in this case is those relating to the superiority of males over females on DAT-Verbal ability and the superiority of students from Addis Ababa over the other group on DAT-Verbal and DAT-Numerical), and (2) determine the specific weights to be assigned to the significant predictors already identified in this paper when selecting students for different faculties.

•   Results of the test conducted to validate the assumptions of the correlation and regression model are so lengthy that it is impossible to report them here. Readers are advised to contact the authors of the article for information on this issue.

REFERENCES

Asmerom Kidane et.al., (1989). *Discontinuation of Students from Institutions of Higher Learning in Ethiopia: Magnitude, Causes, and Cures*. **The Ethiopian Journal of Education**, X(2), 9-21.

Bartlett, M. (1937). **Journal of Royal Statistics**. Soc. Suppl., 4, 137

Belay Tefera (1990). **An Evaluation of the Predictive Validity of Admission Criteriafor Teacher Ttraining Institutes in Ethiopia**. Unpublished Masters Thesis, Addis Ababa University.

Bennett, G., Seashore, H., and Wesman, A. (1959). **Differential Aptitude Tests: A Manual,** 3rd ed. New York: The Psychological Corporation.

Bhalla S., and Belay Tefera (1991). **ESLCE as an Admission Instrument for Higher Education - Experiences and Lessons to Learn.** A paper prepared for a workshop on ESLCE, Organized by the Institute of Educational Research, Addis Ababa University

Dejene Leta (1990). **Achievement, Washback, and Proficiency in School Leaving Examination: A Case of Innovation in an Ethiopian Setting.** Unpublished Ph.D thesis, University of Lancaster.

Draper, N. and Smith, H. (1981). **Applied Regression Analysis**. New York: Willey.

Hills, J. (1964). *Prediction of college grades for all public colleges of a state.* **Journal of Educational Measurement**, 1, 155-159.

Hills, J. (1971). *Use of Measurement in Selection Land Placement.* In R.L. Thorndike (Edr). **Educational Measurement**, 2nd ed. (pp. 680-732)

Hills, J., Gladneym, M., and klock, J. (1967). *Admissions*. **Journal of Educational Measurement,** 4, 263-67.

Horst, P. (1966). **Psychological Measurement and Prediction**. Belmont, Clif: Wadsworth.

Kebede Adera (1991). **The Prediction of the Academic Achievement of Students from High School Grade Point Average ESLCE and Selected Aptitude Tests in the Junior College of Commerce**. Unpublished Masters Thesis, Addis Ababa University.

Kerlinger, F. and Pedhazur, E. (1973). **Multiple Regression in Behavioral Research**. New York: Molt, Rine Hart & Winston.

Lakew W/Tekle (1972). **The differential Effectiveness of Amharic and English Language Predictors of College Success in Ethiopia.** Ph.D dissertation, Syracuse university.

Lehitenen, J. (1991). *Alternatives to the Ethiopian School Leaving Certificate Examination (ESLCE).* **Proceedings of the workshop on Major Issues Related to the ESLCE and Possible Solutions,** IER, AAU.

Makonnen Yimer et.al., (1991), **The Comparability of the Predictive Power of the Ethiopian School Leaving Certificate Examination with Other Measures: Preliminary Observation,** prepared for a Workshop on ESLCE, Organized by The Institute of Educational Research, Addis Ababa University.

Mittman, A. (1972). **A Multivariate Prediction Study for Haile Selassie I University.** Technical Report, University Testing Center.

Sechrest, L. (1963). *Incremental Validity: A recommendation.* **Educational and Psychological Measurement,** 23, 153-158.

Snedecor, G. and Cochran, W. (1967) **Statistical Methods**. New Delhi: Oxford & IBH Publishing Co. pub. Ltd.

Stanley, J. and Porter, kA. (1967). *Correlation of Scholastic Aptitude Test Scores with Grades for Negros Versus Whites.* **Journal of Educational Measurement,** 21, 199-218.

Tassew Zewdie, et.al., (1990). **Assessment of the Degree of Correlation Between** *the ESLCE Results and Four Years of Secondary School and University Academic Performance. Institute of Educational Research, Addis Ababa University.*