

**Economics of quality education and paths leading to quality education: Evidence from
Debre Markos University,
Tsegaye Molla¹**

Abstract

The difference in economic development among nations is entirely emanating from difference in human capital development as it is the priority pathway out of poverty, diverse socio-economic and environmental crises. Although huge investment in human capital development has long been made, a mere cost of education will never lead to quality labor force unless paths for quality education (be it internal or external to students) are well substantiated. With this essence, this study was initiated with the objective of identifying paths leading into and out of quality education. The data for the study were obtained from sample of 150 students selected using multi-stage sampling. Factor analysis and path analysis techniques were employed to identify components explaining the most for variation in academic performance and to identify statistically significant paths leading into and out of quality education, respectively. Accordingly, macroeconomic situations (unemployment), student's learning-attitude, communication skill, curriculum teaching method, learning facility and school-family background were found as statistically significant factors together explaining 84% of the variation in students' academic performance. The path analysis result reveals that learning facilities and macroeconomic situations are statistically significant and have the largest share of determining quality education signifying calibration of educational institutions with required facilities towards quality education. Evidently, a country expecting fruitful returns from huge education investment has to do more for quality education at micro level to produce quality labor force at macro level. Hence, a paradigm shifts from internal (at students and institutions) - to external are needed. Specifically; ensuring cumulative grade point average (CGPA) based employment than chance-based, equipping students morale with entrepreneurship, fulfilling, learning, facilities, integrating group-learning-group-communication-practicum, revising curriculum (abandoning simultaneous delivery of block and parallel courses), assisting students from low-income or no family are necessary policy interventions recognized as economical pathways to realize our quest for "quality education and quality labor force for economic development" fall policy interventions are synergistically implemented with greater inter-sector integration from micro up to macro levels.

Keywords: Quality education, Quality labor, Paths to quality education, Economic development

¹Department of Agricultural Economics, Debre Markos University, Ethiopia, E-mail: tsegayem4@gmail.com

• **Introduction**

Improving educational quality requires a focus on institutions and efficient education spending (WB, 2007). Investment in human capital development is the primary for every nation provided that they aspire to bring economic growth (Bas, n.d.). And it is true that difference in economic development among nations is entirely emanated from differences in human capital development being the latter is deemed as the only path way out of diverse

socio-economic and political blights of nations. But, human development in Ethiopia is still a problem and its HDI value stood at 0.442 (HDR, 2015) and the country is classified as a low human capital development country despite several improvements in educational achievement have been registered since the intervention period of MDGs (UNDP, 2014).

Ethiopia’s vision, during the period of GTP II, in its quest to become a middle-income country (UNDP, 2014) is to build an education and training system which assures quality and equity in education by the year 2019/20 with the aim of producing competent human resource for the country. Higher education institutions are still among major priority areas identified and planned by the education sector to ensure the relevance and quality of education at all levels besides general education and TVET (FDRE, 2015).

Noting this fact, acting dynamically and working for sustainable human capital development via educational policy reform is imperative to frequently investigate and assure the progress of quality education for producing qualified human capital on behalf of realizing sustainable economic development of Ethiopia. Hence, this study was initiated with the aim of identifying feasible paths leading higher educational institutions to attain quality education which is deemed to have policy relevance for better targeting by educational policy makers and other stakeholders.

- **Methodology**

- **Sample Size and Sampling Technique**

The study was done in Debre Markos University which is one of the second generation public universities in Ethiopia established in November 2007. Multi-stage sampling procedure was used to select sample undergraduate students and their total number was determined by using a simple formula developed by Yamane (1967). The first stage involved purposive selection of Agriculture College followed by stratification into five departments for sample representativeness. Finally, after identifying the sampling frame containing the complete list of all students per stratum (department), a total of 150 sample students were randomly selected using probability proportional to size sampling technique.

$$n = \frac{N}{1 + N(e)^2} \dots\dots\dots(1)$$

Where *n* is total sample students and *N* is total undergraduate students within the selected five departments, and *e* is the level of precision set at 5%.

Before actual primary data collection was made, the questionnaire was restructured by conducting pilot survey with few undergraduate students for the pursuit of both incorporating relevant variables and ensuring reliability of data.

2.2 Methods of Data Analysis

To achieve the objective of the study, factor analysis was employed to analyze primary data collected from sample students. It is popularly used by many researchers (Kyoshaba, 2009; Ibrahim *et al.*, 2009; Irfan & Shabana, 2012; Georgis *et al.*, 2012; Samuel & Kibrom, 2015) to reduce many variables into smaller principal factors and to pinpoint which of the factors have the most impact (DiStefano *et al.*, 2009; Williams *et al.*, 2010; An & Sean., 2013) for variation in academic performance of students thereby to ease policy interventions for urgent

remedial action. After identification of principal factors, OLS regression model was fitted by regressing student's academic performance upon factor scores computed from factor analysis for identification of theoretically sound and statistically significant variables (factors) determining student's academic performance. The dependent variable was student's academic performance and regarding its measurement, some researchers have used five-point Likert-scale (Georgis *et al.*, 2012; Irfan & Shabana, 2012) while others have preferred to use GPA (James, 2005; Jessica, 2006; Victor, 2011) as a valid measure of student's academic achievement given that the assessment and grading procedures used by teachers is accurate (James, 2005). However, the appropriateness of CGPA is conditional upon academic results limited to specific subjects/courses, particular semester, year and single test scores. If not using CGPA will have problem of convergence and hence not indicative of differential academic performance of students in every course and semester.

For the purpose of this study, academic performance of the student was measured by using a five-point Likert-scale (proxy for quality education ranging from strongly agree to strongly disagree) as it was deemed valid measure for capturing variability in their academic performance. Various factors drawn from literature and researcher's personal experience were considered by factor analysis and path analysis for extraction of principal factors and validating statistically significant paths to quality education. Factor analysis used by this study is formulated as:

$$Z_{p \times 1} = \lambda_{p \times m} F_{m \times 1} + e_{p \times 1}$$

Where:

Z = px1 vector of variables

λ = pxm matrix of factor loadings

F = mx1 vector of factors and

e = px1 vector of error or residual factors (Sharma, 1996).

To facilitate interpretation of factor loadings, VARIMAX rotation was used. Factor coefficients were used to obtain factor scores for selected factors. Perceived score values of selected factors were considered as independent variables for predicting students' academic performance and used for path regression analysis. Path regression equation fitted to identify feasible paths leading to better academic performance of students as given below:

$$AP = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + e_i$$

Where AP = perceived academic performance; a = regression constant (the value of intercept and its value is zero); b_1 , b_2 and b_3 are regression coefficients and e is the error term. F-statistic and coefficient of determination (R^2) were used as a criteria of validation of goodness-of-fit (predictive success) of the fitted regression model.

3. Results And Discussion

3.1 Pathways Leading into and out of Quality Education

3.1.1 Factor Analysis

Dynamic studies on quality education deterrents are required to take proactive and reactive measures for delivery of quality education among higher education institutions of Ethiopia.

Factor analysis was done to extract principal external and internal factors determining quality education. The KMO value was found to be 0.656 for all items included for analysis and the corresponding test statistic value for Sphericity was found significant indicating appropriateness of the data for factor analysis as shown in Table 1.

Table 1. KMO and Bartlett's Test

| | | |
|--------------------------------------------------|--------------------|---------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .656 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 616.626 |
| | df | 210 |
| | Sig. | .000 |

Source: Survey, 2016

To account for which factors influencing students' academic performance, those factor components Eigen value greater than 1 were considered and 7 factors were extracted (Table 2). Accordingly, these seven factors are explaining 74% of variations in the academic performance of students. Specific to components, macroeconomic environment is the external component explaining the largest variation (more than 19%) in academic performance.

Table 2. Total Variance Explained

| Component | Initial Eigenvalues | | | Rotation Sums of Squared Loadings | | |
|-----------|---------------------|---------------|--------------|-----------------------------------|---------------|--------------|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 5.534 | 26.353 | 26.353 | 4.024 | 19.162 | 19.162 |
| 2 | 2.190 | 10.430 | 36.783 | 2.309 | 10.995 | 30.157 |
| 3 | 2.090 | 9.952 | 46.735 | 2.088 | 9.941 | 40.098 |
| 4 | 1.730 | 8.238 | 54.973 | 1.890 | 9.002 | 49.100 |
| 5 | 1.563 | 7.442 | 62.416 | 1.784 | 8.497 | 57.597 |
| 6 | 1.336 | 6.360 | 68.775 | 1.756 | 8.360 | 65.957 |
| 7 | 1.098 | 5.227 | 74.003 | 1.690 | 8.046 | 74.003 |
| 8 | .905 | 4.312 | 78.315 | | | |
| 9 | .783 | 3.730 | 82.044 | | | |
| 10 | .659 | 3.139 | 85.184 | | | |
| 11 | .658 | 3.133 | 88.316 | | | |
| 12 | .439 | 2.089 | 90.405 | | | |
| 13 | .432 | 2.055 | 92.460 | | | |
| 14 | .348 | 1.658 | 94.118 | | | |
| 15 | .289 | 1.376 | 95.494 | | | |
| 16 | .244 | 1.160 | 96.654 | | | |
| 17 | .192 | .917 | 97.570 | | | |
| 18 | .180 | .856 | 98.427 | | | |
| 19 | .154 | .735 | 99.162 | | | |
| 20 | .130 | .618 | 99.780 | | | |
| 21 | .046 | .220 | 100.000 | | | |

Table 3: Factor Loading

| Factors | Items | Loadings |
|------------------------|-----------------------------------------|----------|
| Labor market problem | Employment inadequacy | 0.927 |
| | Employment not considering CGPA | 0.886 |
| | Employability after graduation | 0.816 |
| Entrepreneurial motive | Entrepreneurial intent after graduation | 0.767 |
| Learning facilities | Lack of adequate laboratory | 0.892 |
| | Lack of adequate ICT | 0.846 |
| | Lack reference materials | 0.820 |
| School climate | Student guidance from teacher | 0.789 |
| | Friends/peer relationship | 0.562 |
| | Learning preference | 0.535 |
| Student personality | High school background | 0.867 |
| | Learning motive | 0.724 |
| | Learning-attitude | 0.657 |
| | Communication skill | 0.615 |
| | Academic preference | 0.586 |
| Curriculum | Lack of practicum | 0.867 |
| | Mode of course delivery | 0.856 |
| | Group learning | 0.734 |
| | Curriculum teaching method | 0.680 |
| Family background | Low income family | -0.649 |
| | No family | -0.622 |

3.1.2 Path Regression Analysis

To identify statistically significant components (based on factor scores), path regression was done (Table 4). Prior to interpreting regression results, the goodness-of-fit test has to be done using F-test statistic for validating strength of the fitted regression model for its predictive power. Accordingly, the F-test statistic value is 28.51 and it is statistically significant. A value of R^2 (0.488) implies 48.8% variability in students' academic performance is explained by the fitted independent variables. Path regression result of predictors of academic performance (table 4) indicated labor market (demand for job) external to students is negatively and significantly determining students' motive towards better academic performance. This is evident that whenever there are no more employment opportunities there out, employability of students will diminish and does not motivate and ready them to perform better by expecting bright future. Learning facilities are also statistically significant variable having positive influence on academic performance of students (86.4% variation) signifying adequate fulfillment of required facilities (like ICT, laboratory technology and reference materials) through prioritization.

Table 4: Estimation Result of Path Regression model

| Factor variable | Coefficients | Std. Error | t | P> t |
|------------------------|--------------|------------|-------------|----------------|
| Labor market problem | -1.355 | 0.587 | -2.31 | 0.010*** |
| Entrepreneurial motive | 1.511 | 1.884 | 0.80 | 0.211 |
| Learning Facilities | 0.864 | 0.455 | 1.90 | 0.029** |
| School climate | 0.293 | 0.471 | 0.62 | 0.267 |
| Student personality | 0.190 | 0.170 | 1.12 | 0.131 |
| Curriculum | 0.117 | 0.152 | 0.769 | 0.220 |
| Family background | -0.138 | 0.218 | -0.633 | 0.264 |
| | | | F-statistic | 28.51(0.016)** |
| | | | Adj-R2 | 0.488 |

*** and ** indicate significant at 1% and 5% probability level, respectively.

Source: Survey, 2016

4. Conclusion and Recommendations

Macroeconomic situations (adequacy of labor market demand) and employability are external factors largely jeopardizing student's motive for better academic performance followed by fulfillment of learning facilities. Even internal forces have conditional effect on quality education as they are driven by external forces altogether to guarantee better academic performance of students. The interplay result will ultimately impact supply of quality labor pertinent for economic development of the country.

Hence, for production of quality labor from huge education investment, identified paths leading into and out of quality education should be relieved with more focus on external forces and internal forces (like learning facilities) exacerbating learning morale of students. MoFEDs has to promote expansionary macroeconomic policies like more investment targeting to increase employment opportunities by absorbing more graduates based on academic performance. Employer institutions should give value for academic performance to ensure fairness for CGPA based employment than pursuing chance-based. To better target against internal problems, educational institutions should capitalize and set priority to fulfill learning facilities required for assuring quality education. Besides; equipping students with entrepreneurial morale, integrating group-learning and practicum, revising curriculum (to abandon simultaneous delivery of block and parallel courses), assisting students from low-income or from no family background are necessary policy interventions recognized as economical paths to realize supply of quality labor force for economic development from quality education if they are synergistically implemented with greater inter-sector integration at all levels of education.

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