



Students' Economic Backgrounds in Meeting Living Costs of Higher Education: A Regression Analysis

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ABSTRACT

Economic backgrounds of students whom demand the higher education service can become a significant criterion regarding accessibility and continuity of the service. Higher education student costs consisting of tuition and living costs can be redeemed by some education aids provided either by governments or private sector for students from a low income group and/or that are successful. In this paper, an empirical study on the effects of economic status of higher education student on bearing their living costs and its results are evaluated. According to the results obtained by testing the model, increase in family income, which is an independent variable, decreases the possibility of difficulty in bearing living costs, while the other independent variables, which are increase in economic independence in housing method of the student and increase in difficulty in covering tuition fees, increase the possibility of difficulty in bearing living costs.

Keywords: Living Cost, Economic Factors, Higher Education, Odds Ratio

JEL Classifications: H52, I22, I24

1. INTRODUCTION

Many countries around the world support financing of higher education, which plays an important role in the development of human capital, with the collaboration of many profit making and non-profit making foundations as well as public and private sectors. In Turkey, total of state and private universities reach out to nearly 200. In Turkey, around 95% of the cost of education in state universities was covered by state contribution via budget allowances while around 5% was covered by student contributions via tuition fees¹. Despite of the public weighted financing structure, because of tuition and living costs, many potential university students with low-incomes are deprived of the right of education. Some of the low-income university students, who manage to study in the universities by passing the university exams, do struggle in covering the costs of higher education and even had to drop out of the university.

In this study, an econometric analysis was made by binary logistic regression (BLR) that researches the effects of economic

background of university students in covering the living costs of education. Data regarding the variables in the model had been obtained by survey method applied in state universities within Istanbul Province that has the most university population in Turkey. In the model, difficulty of a student in covering the living costs while studying in the university is determined as dependent variable while the household income, type of student's residence and difficulty of the student in covering the tuition fees are determined as independent variables.

1.1. Higher Education as Public Good

Basic opinion in literature regarding education is that the market organization will fail in optimal distribution of resources in the education sector which will lead to mandatory intervention of government in the education market. Government intervention in education services is considered as positive because of two basic criteria. First, education service provides economic and social benefits for not only to the education service receiver but also to the community (externalities argument). Second, individuals from low income groups can access to education which becomes costly as its level increases (equality argument) (Çokgezen, 2011).

¹ The application of tuition fee for daytime education was stopped in 2012; on the other hand this legal decision did not cover for evening education and distance education (The Official Newspaper of Turkey, 2012).

The highest level of education, which is university, causes increase in the future income and encourages participation in various social groups leading to a healthier and happy life. Higher education service provides positive externalities economically, socially and culturally as well as its personal and social benefits. Social benefits of higher education include accelerative effect on development and economic growth besides its effect on reducing unemployment, increasing literacy, decreasing crime rates, rectifying income distribution, increasing production factors in the future and its effect on increasing income tax collected by the government in parallel with the increase in personal incomes. Higher education service can be produced in the market because of its financial and personal - non-financial-benefits. It is also a service area with public production and presentation because of its social benefits (positive externalities). Therefore, education service is characterized as “semi-public good” or “composite product.”

1.2. Researches on Financing Higher Education

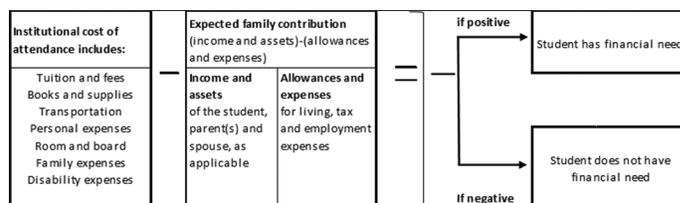
In literature, studies regarding finance of student costs in higher education, which is distinguished with its personal benefits among other education services, dates back to over 200 years. In Adam Smith's renowned book “Wealth of Nations,” it is mentioned that professors get paid depending on the number of students enrolled in their classes (Adam, 1789). Econometric studies (Schultz, 1961; Becker, 1964; Blaug, 1970) related to higher education has come up mainly in 1960s and 1970s because of the improvements in theory of human capital in order to predict the yield ratio of education.

In 1970s, financial aids offered to students and government supported student loans with low interest did become increasingly popular and aids did cover more students because of low tuition fees in government universities. Many empirical economists have conducted studies researching the effects of government financial aids on low income families, minorities, etc., according to their enrollment and completion status (Ehrenberg, 2003). The basic study in this field has been conducted by Manski and Wise (1983) based on “National Longitudinal Study” data for 1972 and then McPherson and Shapiro (1991), Kane (1994) and Dynarski (2003) have contributed to the literature with their studies in the same field.

Developments in financing student costs in higher education have led to changes in labor market. As finance alternatives vary in higher education, higher education service is accessed by more students and therefore students from low income group have the opportunity to receive the education they desire. With the increase in participation in higher education, qualified labor force supply and demand has increased, the quantity of unqualified employers has decreased and the competitive fields in the country has diminished (Björklund et al., 2004).

There are various country applications in calculation and financing of student costs in higher education. In Figure 1, there is a method formulated by United States of America Government Accountability Office in order to determine in which conditions should college or university students require financial aid.

Figure 1: Counting the financial need of a college/university student



Source: United States Government Accountability Office, 2009

According to Figure 1, college/university student's educational costs, which are tuition and their living costs are on the left. If the result obtained by subtracting the expected family contribution (after family expenses are deducted from their income) from these costs is positive, i.e. family contribution is insufficient in bearing the student's tuition and living costs, then the student is need of financial aid. In case the result obtained is negative, then it means that the student does not need financial aid. In conjunction with all the evaluations, if students that have difficulty in bearing their tuition and living costs and in need of financial aid do not receive the financial aid, then they can be excluded from the higher education service.

1.3. Researches on the Relation between Higher Education Students' Economic Background and Enrollment

Many researches (Karen, 2002; Kim and Schneider, 2005) show that parents' education and family income are positively associated with college enrollment. There is further evidence that these associations are increasing over time. From 1971 to 2000, the probability of freshman who have highly educated parents entering selective colleges remained relatively unchanged at 20%. The probabilities among students with low-and middle-educated parents, however, declined where the decline was sharpest among those with less-educated parents (Astin and Oseguera, 2004; Roksa et al. (2007) find that the association between parental education and participation at 4-years colleges increased between the 1980s and 1990s. Studies regarding the effect of family income levels on academic achievement levels of children conducted by Duncan et al. (1998) and Melby et al. (2008) have significant determinations. In these studies, it is emphasized that the academic achievement of students whose families had low incomes during their childhood and youth was affected adversely and the number of years of education received by children from such families has decreased.

According to the result of an empirical study regarding costs of higher education students (Ekinci, 2009); it is shown that almost all students in the survey sample within the scope of the study have spent a significant amount of money (4,475 TL) for the purpose of university entrance preparations compared to the incomes of the households, and in general, the share of the private cost (8,692 TL) is greater than the share of the public cost (6,647 TL) in annual unit cost (15,339 TL). At the same study, if the ratio of total personal expenses covering living costs of students to household income groups is reviewed, it is observed that total personal expenses of the student increases as the income of the household increases. In another study (Ekinci, 2011), it is determined that the income of the household has effect on the student's selection of university

and program, and children of families from high income group get higher education on areas with higher income.

In general there are 3 methods to cover the living costs of students of higher education. First one is financial support of the family, as mentioned before; the second one is refundable and non-refundable grants provided by public and private organizations, and the latter is personal income of students earned by part-time working (Çam, 2013). In higher education, scholarship method used widely all around the world for students to bear their living costs are not sufficient in Turkey. Student loans provided by Republic of Turkey Credit and Dormitories Institution for students to finance their living costs are significantly low. Credit and Dormitories Institution has provided student loan of 330 TL for undergraduate students in 2015 and 400 TL in 2016. These student loans for 2015 and 2016 were calculated based on "poverty threshold according to household sizes" for 2009 by Turkish Statistical Institute² 579 TL and 624 TL in 2015 and 2016 respectively are far from bearing poverty threshold (Turkish Statistical Institute, 2016). Therefore, students need the financial support of their parent and to work part-time in some cases in order to over their living costs.

2. METHOD

In this study, the direction and level of the effect of the economic status of university students studying in state universities in Istanbul during 2010-2011 academic year on bearing living costs including costs such as housing, food, transportation and stationery are measured. In line with this, econometric model below is based on BLR prepared by the data obtained from the survey analysis on 1067 students.

$$LC = \beta_0 + \beta_1 \times F + \beta_2 \times S + \beta_3 \times T + e$$

Independent variables in the model are represented by F, S, and T for monthly average income of the family, housing location of the student and difficulty of the student in bearing the contribution margin, respectively. LC, which is a dependent variable, indicates the difficulty level of the student in bearing living costs.

3. RESULTS

Answers given by the students answering the survey regarding the parameters in the model are provided in Table 1 by using dummy variables.

Independent variables of the study model shown in Table 1 including their codes are economic factors that may affect living costs in higher education. Monthly average income of a family is calculated based on the net minimum wage for persons over 16 years of age in 2012, which is 701.14 TL (Ministry of Labor and Social Security of Turkey, 2012) and poverty threshold of a 4 person family, which is 2,903.81 TL (Confederation of Turkish Trade Unions, 2012). Not having difficulty in bearing higher education costs, which includes tuition fees and living costs, is coded as 0 while having difficulty is

coded as 1. Also housing method of the student is coded by numbers starting from being economically dependent to independent.

In Table 2, the answers of the participants of the survey for the dependent and independent variables are provided.

When we look at the ratio in Table 2, 58% of the families' average monthly income is below 2,901 TL (as poverty threshold is considered as 2,093.81 TL). Also 76.5% of the students that participated in the survey indicated not having difficulty in bearing tuition fees. Having difficulty in bearing living costs which is included in higher education costs is approximately 31%, which is 5% higher than tuition fees. Considering approximately 95% of the higher education tuition costs were financed by the government at the time of the survey, it is normal that having difficulty in bearing living costs which consists of various parameters is more observed than having difficulty in bearing tuition fees.

The results of the logistic regression for the econometric model used in this study are shown in Table 3.

According to the results in Table 3, it is possible to see satisfactory results in significance levels of independent variables (if significance level of 0.05 is taken as basis) in the model. In the model results, $-2 \log$ likelihood value is obtained as 788.954, while Cox and Snell R^2 value is obtained as 0.379 and Nagelkerke R^2 value is obtained as 0.534. These results are highly sufficient in terms of significance.

4. DISCUSSION

If odds ratio are calculated by using $\text{Exp}(\beta)$ values in Table 3;

$$\begin{aligned} \frac{\Pi}{(1-\Pi)} &= e^{\alpha} \times e^{\beta_1 X_1} \times e^{\beta_2 X_2} \times \dots \times e^{\beta_n X_n} \\ &= e^{-0.99} \times e^{-0.238(F)} \times e^{0.242(S)} \times e^{3.23(T)} \\ &= 0.371 \times 0.788(F) \times 1.274(S) \times 25.28(T) \end{aligned}$$

When odds ratio calculated are examined, it is possible to determine that increase in average monthly income of the family decreases the possibility of the student having difficulty in bearing living costs by 21%. Also, student's housing method during higher education changing into independent from dependent increases the possibility of having difficulty in bearing living costs. Additionally, student having difficulty in bearing tuition fees severely increases the possibility of having difficulty in bearing living costs as this situation is in parallel with higher education student costs consisting of tuition fees and living costs.

In terms with the data obtained in this study, if we look at the possibility estimations for the logistic regression equation;

$$\hat{\Pi} = \frac{e^{(\alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3)}}{1 + e^{(\alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3)}}$$

By using the equation above, the possibility estimation of the higher education student having difficulty in bearing living costs whose family income is <700 TL, living with the family and

² Poverty thresholds for 2015 and 2016 are calculated by the author based on consumer price indexes.

Table 1: Codes of independent and dependent variables in the model

Independent variables	Description	Code
F	Monthly average income of the family	700TL and less=1, 701-1,000 TL=2, 1,001-1,300 TL=3, 1,301-1,600 TL=4, 1,601-1,900 TL=5, 1,901-2,200 TL=6, 2,201-2,500 TL=7, 2,501-2,900 TL=8, 2,901 TL and over=9
S	Housing method of the student	With family=1, With relatives=2, public dormitory=3, private dormitory=4, sharing house with friends=5, alone in rental house=6, at parent's house present in the city of the university=7
T	Difficulty of the student in bearing contribution margin	No=0, Yes=1
Dependent variable	Description	Code
LC	Difficulty of the student in bearing living costs	No=0, Yes=1

Table 2: Survey results of independent and dependent variables in the model

Dependent variable: LC	
Did you have difficulty in bearing your living costs (housing, food, transportation, stationery) while continuing your higher education?	%
No	69.1
Yes	30.9
Independent variables: F	
What is the total average monthly net income of your family (including your income, if there is) in TL?	%
700 and less	0.4
701-1000	4.2
1,001-1300	7.1
1301-1600	5.4
1601-1900	4.7
1901-2200	12.1
2201-2500	12.2
2501-2900	10.6
2901 and over	41.7
Unanswered	1.6
Independent variables: S	
Where do you stay during your higher education?	%
With family	39.6
With relatives	3.9
Public dormitory	14.6
Private dormitory	10
Sharing house with friends	23.3
Alone in rental house	6.5
In my family's home in the city that I go to university	1.2
Other	0.7
Independent variables: T	
Did you have difficulty in bearing your tuition fee while attending higher education?	%
No	76.5
Yes	23.5

with parents and with an average monthly income <700 TL is 0.90, it decreases to 0.88 if the family income is in between 701 and 1,000 TL and to 0.85 if the family income is in between 1,000 and 1,300 TL. Therefore, the income interval of the family has a significant role in the possibility of having difficulty for a student in bearing living costs.

5. CONCLUSION AND SUGGESTIONS

Tuition fees and living costs, which are student costs in higher education, have been covered in many studies since 1960s. Various solution methods have been suggested in bearing these costs and some methods have been applied in various countries. Turkey is way behind the developments around the world in financing of higher education students which became progressively significant and suggesting alternative solutions for problems caused by their economic backgrounds.

Tuition fees are canceled by a regulation issued in 2012 and students who are getting formal education during day time and completing their education in due course has earned free education. However, evening education students and distance education student pay a fee under education fee and the Open University students pay a fee under material fee. Tuition fees are canceled regardless of criteria such as limited student profile, income level and achievement level. Moreover, students getting evening education, distance learning and studying in the Open University are still suffering from bearing their education costs. Living costs, which is the other section of student costs in higher education except tuition fees, are covered by credit and dormitories Institution as student loans and scholarships. It is possible to say that financial aids provided by the government to a limited number of students are far from even meeting the poverty threshold.

In Turkish higher education system, besides public financial resources the variety of private financial resources and their share in total financing should be increased. This development can be supported by forming a new finance model for higher education in Turkey. In this new finance model, related public institutions in the government (such as Council of Higher Education, Credit and Dormitories Institution) should consider tuition fees and student loans that accentuate equality in opportunities and consider the socio economical background of the students. Also, under their

having difficulty in paying tuition fees is 0.90. However, if the student is staying with a relative, the possibility estimation for having difficulty in bearing living costs is 0.92 and if the student is residing in a public dormitory, then the possibility estimation is approximately 0.94. In conclusion, as the student becomes financially independent in housing costs, which are included in living costs, it becomes more difficult for the student to bear living costs.

As the possibility estimation of having difficulty in bearing living costs for a student who has difficulty in paying tuition fees, living

Table 3: Regression analysis results

Variables	β	S.E.	Wald	df	Significant	Exp (B)	-2 log likelihood	Cox and Snell R ²	Nagelkerke R ²
F	-0.238	0.041	33.852	1	0.000	0.788	788.954	0.379	0.534
S	0.242	0.040	36.849	1	0.000	1.273			
T	3.230	0.220	216.309	1	0.000	25.269			
Constant	-0.990	0.355	7.795	1	0.005	0.371			

social responsibility, private sector should increase their financial support under government control to low income group and/or successful students studying in public universities in order for them to cover their living costs.

It is also important that the new higher education financing model should support higher education students to work in the labor market. Today students are graduating without having any work experience related with their academic fields as many faculties do not have mandatory internship requirements. Yet, offering mandatory internships and even part time job opportunities in public or private sectors should be supported for higher education students to cover their educational costs and to enter into their careers while having their academic education.

6. ACKNOWLEDGMENT

The econometric model in this study was derived and analyzed using the parameters and related data of the 17,568 project number "Alternative Approaches in Financing Costs of Higher Education: Method of Loan System" composed of 33 questions, applied to 1,067 subjects and supported by the University of Istanbul, Department of Scientific Studies.

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