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Time Poverty among Students of Jigjiga University

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Abstract
Jigjiga University students allocate their limited resource of time in to four classifications: contracted, committed, necessary and free time, from this majority of time was allocated to necessary time, though time has poverty. There is gender wise disparity, for male largest proportion was to contracted time while necessary time for female. 4:40 hrs/day was taken as threshold from average of their free time. Using this poverty line, measurement of time poverty were undertaken using headcount index and found that 53.87% of students are time poor. Time poverty can be determined by study time, time for religion, gender and years of enrollement.For such analysis, as time poverty is binary variable, probit model were suited. And after passing the necessary statistical, econometrical procedure and using STATA 10, the likelihood of time poverty would increase as study time and time for religion increase, significantly. But surprisingly as for female the probability to be time poor are inversely related. Those who are time poor are those who allocate their time for study (on/off class) ceteris paribus therefore time poor student have sound academic performance (CGPA). And also academic performance measures quality of education. CGPA affected by study time but study time is endogenous variable. To avoid such violation of OLS assumption we used recursive regression model. Using this regression both CGPA and study time were treated as dependent variable individually. Therefore the result of the regression indicates CGPA determined by study time, which is for every additional hour for study time CGPA increase by 0.064 points. When we went to the regression on factors that affect study time we found that, Grade 12 result of SAT positively affects study time. Surprising! Also times for internet (particularly Facebook) affect study time negatively, that is for each hour of time for Facebook students decline their study time by one third hour. And there are other factors significant to dependent variables.
Keywords: time poverty, Jigjiga University students, probit model, recursive regression

1. Introduction

The metaphorical expression "*time is money*" can holds true for University students if it were arranged like *time is grade*, which is if the students spent much of their time to study their lesson; they can succeed in passing the exam and/or recording good result. It is rational to expect of University students require to devote much of their resources – time, because time is a precious resource once it is gone, it never returns. As such, it is imperative to utilize time appropriately. Those students who manage their time well are more productive on their result and future carrier.

According to Aas (1982), classification of national time use study identifies four main time categories: namely, contracted, committed, necessary and free time. Contracted time (is the time spent for study be it on class and off class activities), committed time (is the time used up for interaction and communication), necessary time (time used up to sleep, to eat, to go to toilet and the likes) and free time which consists of the 24 hours of the day minus contracted, committed and necessary time.

Activities of University student are visible and limited, if students intend to devote much of their time in an avoidable way they will bear the cost. The things that make action to be unnecessary are, if students spend much of leisure hours than the study. Meanwhile as Saqib & Arif (2012) argue, time can be used in both self-care and leisure as well. Self-care and leisure may be regarded as utility enhancing consumption activities, but their role in improving human capital cannot be ignored. Spending time in rest, leisure and taking care of ourselves makes us more productive.

As poverty dimension are many, time also have poverty that is when the amount of leisure time is less than the threshold, those students who do not meet this minimum requirement are considered to be time poor. This research therefore, aims to investigate the determinant of time poverty and academic performance of the students' per se regular students of Jigjiga University. This made this research new in dimension and study group.

2. Literature Review

Vos. (1996) stated investment in education will directly raise the well-being of individuals, but it will also raise their `human capital' and capacity to acquire means for the satisfaction of other basic needs.

According Clarke (2002) quality of education that underpins most ranking efforts can be organized into three categories: student achievements, faculty accomplishments, and institutional academic resources**.** Specifically Bratti and Staffolani (2002) conclude quality of education can be attained by the characteristics of educational institutions, which include class size, teacher-student ratios, expenditure per student, and differences between public and private institutions. On the other side student behavior, namely student time allocation has

effect on academic performance.

Gartner and Zulauf (1998) explain factors that determine academic performance of three class at Ohio State University during autumn quarter 1997, and here are the factors time spent on studying ,time spent on, class meeting time, hoped for GPA(grade point average),ACT score, gender ,cumulative credit hours at the beginning of fall quarter ,time management score and attendance.

3. Research Method

The main source of data for researcher question on time poverty among students of Jigjiga University was primary. The data were collected using probabilistic sampling technique. After deducting the number first year students (in 2014 academic year) (this is because, for the problem of the study first year students are not compatible) from the total population of regular students 4180 was found. Using simple random sampling 250 students were used as sample to fill questioner but 245 of them were accurately return. Descriptive and econometrics methods were used to analyze our three objectives namely: measuring time poverty among students, find correlates of time poverty and Investigate academic performance of student.

3.1 Model specification

Measuring time poverty

From the FGT class of poverty measures the headcount measure was used because of study it's the most sensible measure. Suppose we have a population of size *n* in which *q* individuals are time poor. Then the headcount index of time poverty is defined as:

$$H = \frac{q}{n} \dots\dots\dots 1$$

Correlates of time poverty

To investigate the determinant of time poverty, probit model was used. Probit model can answer the question that is a scalar dependent variable Y is a binary variable, Y Ɛ (0, 1)

The general expression of the model is going to be:

$\mathbf{Y}^* = \boldsymbol{\alpha} + \boldsymbol{\beta}\mathbf{X}' + \boldsymbol{\varepsilon}$ …….2

Where $\begin{cases} y_i = 1 \\ y_i = 0 \end{cases}$ if $\begin{cases} y^* > 0 \text{ there is time poverty} \\ y^* \leq 0 \text{ there is no time poverty} \end{cases}$

$\mathbf{Y}^*$ is unobserved, it is referred to as a **latent variable which indicates** is the probability time poverty.

$\mathbf{X}'$ is the vector of explanatory variables that is believed to determine time poverty

So the model will take the form of

$P(Y_i=1) = \Phi(\boldsymbol{\beta}\mathbf{X}')$ ……..3

Investigate Academic Performance of Student

According to Oladipo et.al.(n.d) the quality of education does not depend only on resource inputs, but also on the output, which includes academic achievement on tests scores and progression and pass rates. Therefore such quality of output would get if use of time by students is proper, that is study time matter most on academic performance of students.

From Gartner and Zulauf (1998) academic performance, was measured by semester GPA,can be viewed as involving the following production function:

Semester $GPA_i = f(I_i , L_i)$…….4

Where I_i is the i^{th} student's inputs and L_i is a set of attributes of i^{th} student that are related to student's ability to manage effectively this production function or personal attributes that may affect the input-output relationship.

The relationship between academic performance and time use to study is causal and this lead to endogenity problem. So to solve this simultaneous equation bias we need recursive regression model that is solved using linear regression. But here there are variables associated with academic performance, including the amount of time spent studying, semester credit hours, gender and other independent variables hypothesized to affect academic performance.

$$Y_1 = \beta_0 + \beta_1 X_1 + \beta_2 X_2 \dots \mu_1 \dots\dots\dots 5$$

$$Y_2 = \gamma_0 + \gamma_1 Y_1 + \gamma_2 X_1 + \gamma_3 X_2 \dots \mu_2 \dots\dots\dots 6$$

4. Results and Discussion

Classification of Time

It was explained by Aas (1982), time allocated in 24 hours classified as contracted, committed, necessary and free time. This classification can be used by University students. From pie chart 1, necessary time took the largest share among other classification of time that is 38.39%, but there is gender wise difference because the highest time share for male goes to contracted time but for female it is necessary time.

Even though there is no much significance difference there is gender gap in allocation for time on leisure because it is about 19.18% and 19.47% of 24 hours a day on average for male and female respectively. Also the case for committed time has a slight difference between the genders, because female allocate more than 1 hr per day for religion but for male its less than 1 hr per day.

Measure of time poverty

Unlike income (food poverty) there is no well established measure of time poverty line .So here the researchers tried to take their own poverty line, we took the relative measure that is 4.4 hours per day, and this is average of free time for all of our sample participant students. Then we measure poverty using FGT. Using head count index, poverty level in Jigjiga University is 53.87%. That 53.87% of students are time poor that is their contracted, necessary and committed time outweigh the free time and these (53.87%) students have time deficit.

Correlates of time poverty

The result of regression on both estimated coefficient and mean are reported in table 4.1 shows that students who allocate more of their time for study (on class and off class) are more likely to be time poor and significant and on average as time for study increase by 1 hour the probability of being poor increase by 8 percentage point. The coefficient on time spent on religion is positive and significantly related with the probability of being poor and the mean value of time for religion the probability of time poorness increase by 18.08 percentage point.

The result on men indicates that men at 5 percentage point less likely to be time poor than women, but negatively insignificant than female. Female students are more likely time surplus and significant.

Those students who are at final study year (senior) are more likely to be time poor but insignificant than junior students. As junior students have most class than senior the likelihood to be poor for this group of students goes down and significant.

Use of time and Academic performance

From the above probit regression result time poverty and study time have significant and positive relationship. Which can raise a question like is there positive relationship between time poverty and academic performance of students?

Academic performance

Plenty of research has been conducted in the field of the input factors of the educational production function to explain the determinants of educational achievement. Most studies focus on institutional inputs, e.g., student-teacher ratio, class size or school or university quality. Only little attention is paid to student-related inputs like the students' time allocation (Grave, 2010). Therefore this research shed some light on the productivity of different time uses with respect to academic achievement.

Grave (2010) translog production function shows that time spent on attending courses and on self-study are substitutes as well as time use for courses and for other study-related activities. In this research from Table 4.2 we found that Cumulative GPA and study time have positive correlation, every additional hour of study time increases cumulative GPA by .064 points (six-point scale) as the study time increases and the marginal impact of additional study is small citrus paribus. Which consistent result with Gartner (1998), study time had significant on quarter GPA that is for each additional hour spent studying during the week increased quarter GPA by only 0.015 points.

Gender is significant. The coefficient indicates that after controlling for the other variables, males achieved a 0.111 higher cumulative GPA than female. Gartner (1998) reported a similar finding in one of his analyses.

Coletta et.al (2007) describe SAT scores provide a readily available alternative means of taking account of students' reasoning abilities. The linear regressions results are presented in the above table indicate that SAT score affect CGPA, positively, Gartner (1998) also gave the same result. But income has insignificant impact on CGPA.

Turning to the study time equation, the time for internet and Facebook in specific variable estimated from equation is statistically significant. Time for internet affect study time negatively that is for every hour of time for Facebook, students decline their study time by about one third hour. As Junco (2011) quoted (Kirschner & Karpinski, 2010) Facebook users reported studying fewer hours per week than non-users. And (Nonis &

Hudson, 2006) witnessed that the Internet, WWW, cell phones, iPhones, and iPods are only part of a vast array of potential distractions to today's college students, who spend less time studying than their predecessors. This thing also happed as the matter of globalization and proximity to new technology (geographically the town is near to the port) students in Jigjiga university share the effect of information technology which has potential to reduce their study time.

After controlling the effect other variables on study time being male has positive relation with the study time. That is study time of male's increases by 0.46719 but it insignificant with females. The most surprising result is on SAT. SAT score and study time are substitute inputs, in his research Gartner (1998) got negative relationship between ACT score and study time. But here we got those who score SAT exam finely would increases there study time keeping other variable remain constant. As expected, hoped CGPA affect study time positively, for every point scale of CGPA increments study time increase by 0.73.

But income, relationship status, time for religion variables hardly affect and insignificant impact on study time.

Conclusion

In Jigjiga University a student after allocating its classification of time to necessary, committed and contracted time within 24 hours they left with free time. And a threshold to analysis whether it exists time deficit or not, 4:40hrs per a day free time helps therefore a student below this estimated line of time is called time poor student or otherwise.

To measure the time poverty, head count index were used that is dividing the time poor student by the total sample population therefore 53.87% of student that include from second to six year students were time poor/deficit students.

Of the classification time, student allocates most too necessary time while for the contracted time which is expected to have the majority of their allocation. There is also gender disparity that is female students give more emphasis to the necessary time unlike male because for the latter contracted time outshine the rest classification of time.

The probability to be time poor were affected, if the time for religion purpose increases that is if students increase his time allocation for his religion in any way this will increase the probability of time deficit significantly. And if time for study (on and off class activity) increase as it will be expected the probability of time deficit will increase. For junior students (not graduating class) of any department the probability of time poverty will decrease and significant, unlike senior students.

If contracted time of students increase, there is increase in time poverty among student, and the time deficit from increment in time for study (on and off class) will increase academic performance of the student. Study time and cumulative GPA of student is highly correlated. To catch the effect study time on CGPA recursive regression was used because of casual relationship between the two variables. Academic achievement of students can help to measure quality of education. Study time and SAT score have positive impact on the cumulative GPA of student and significant. Male student have higher CGPA score than female students. while when study time were used as dependent variable , SAT score and hoped CGPA have positive relation with time to study while the time for internet in specific Facebook can significantly reduced time for study. Male student allocate much time than female students for study (on and off class) purpose.

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Annexes:

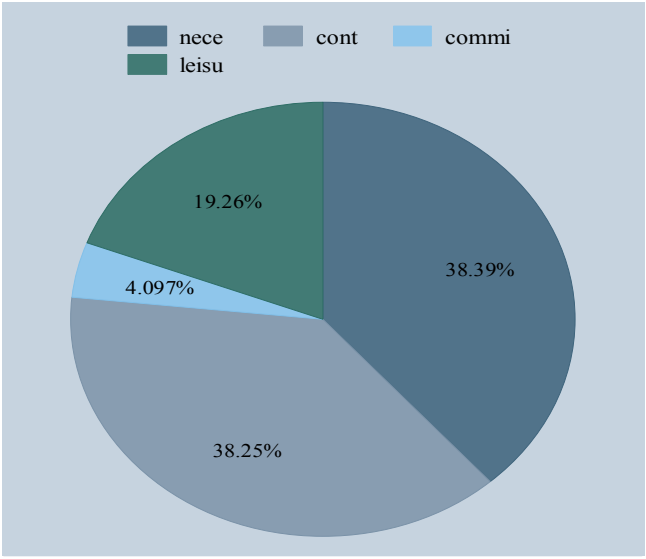
Table 4.1: Summary result of probit model on determinant of time poverty

```
. probit poornot relhour sthours gender senior,nolog

Probit regression                                 Number of obs   =        245
                                                  LR chi2(4)      =      29.94
                                                  Prob > chi2     =     0.0000
Log likelihood = -154.11401                       Pseudo R2       =     0.0885

------------------------------------------------------------------------------
    poornot |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
------------+----------------------------------------------------------------
    relhour |   .4567158   .1233938     3.70   0.000     .2148684    .6985632
    sthours |   .2006269   .0523191     3.83   0.000     .0980833    .3031705
     gender |  -.1304072   .1923042    -0.68   0.498    -.5073164    .2465021
     senior |   .1385207     .17635     0.79   0.432     -.207119    .4841603
      _cons |  -1.047348    .286884    -3.65   0.000    -1.609631   -.4850659
------------------------------------------------------------------------------
```

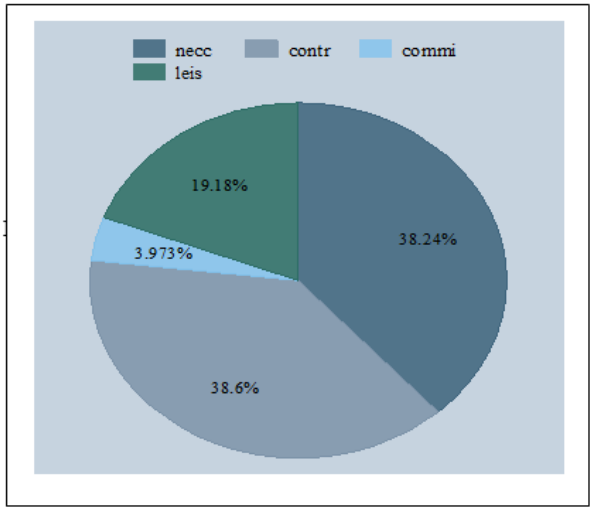
Table 4.2: Summary result of recursive regression model on factors affect academic performance of student

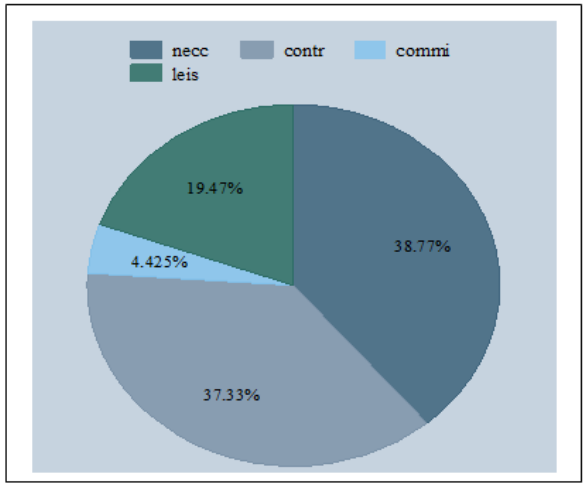
sureg (cgpa studytime income gender sat) (studytime income gender sat relio intern hoped> cgpa),corr
Seemingly unrelated regression

```
------------------------------------------------------------------------------
Equation        Obs  Parms    RMSE    "R-sq"      chi2       P
------------------------------------------------------------------------------
cgpa            245      4   .4945772   0.0587      22.18     0.0002
studytime       245      6   1.576061   0.1173      35.60     0.0000
------------------------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
cgpa         |
   studytime |   0.0647186*   .0194097     3.33   0.001     .0266763    .102761
      income |    4.43e-06     .0000696     0.06   0.949    -.0001319    .0001407
      gender |   0.1118134***  .0724522     1.54   0.123    -.0301904    .2538172
         sat |   0.0045258**   .0025735     1.76   0.079    -.0005183    .0095698
       _cons |   2.351274*     .1517569    15.49   0.000     2.053836    2.648712
-------------+----------------------------------------------------------------
studytime    |
      income |   -0.0002094   .0002241    -0.93   0.350    -.0006487    .0002299
      gender |    0.4671959*  .2310373     2.02   0.043     .0143711    .9200206
         sat |    0.0169924*  .0082081     2.07   0.038     .0009048     .03308
       relio |   -0.1132398   .1216804    -0.93   0.352    -.3517289    .1252494
      intern |   -0.2940177*  .1385163    -2.12   0.034    -.5655046   -.0225309
   hopedcgpa |    0.7321235*  .2300813     3.18   0.001     .2811723    1.183075
       _cons |    0.6876344   .8500979     0.81   0.419    -.9785269    2.353796
------------------------------------------------------------------------------
Correlation matrix of residuals:
             cgpa  studytime
      cgpa    1.0000
studytime    -0.0675     1.0000
Breusch-Pagan test of independence: chi2(1) =     1.117, Pr = 0.2906
***,**,* significant at the 15, 10 and 5 percent test level respectively
```



Pie chart 4.1: Classification of time across students





Pie Chart 4.2: Classification of Time across Gender