DETERMINANTS OF HOUSEHOLDS' WILLINGNESS TO PAY FOR PUBLIC HIGHER EDUCATION IN DODOMA MUNICIPALITY, TANZANIA

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CHAPTER 3 ABSTRACT

The study assessed the extent to which parents' socio-economic conditions and students' education backgrounds influence households' ability and willingness to pay (WTP) for public higher education in Dodoma municipality, Tanzania. The unit of analysis was the household composed of at least one parent and one university student. Since the response to willingness to pay question was binary demanding a "Yes" or "No" answer, we used probit model to examine more rigorously whether or not households were different between the two lines of choices. The main finding was that, on average, parents were able and willing to pay 335,000 Tsh. per student per annum. It was further found out that if user fee continued to be used as the policy option in the country, special attention needs to be paid on parents' education, income, marital status and family size. This is because this study showed that these factors significantly conditioned households' WTP in different directions.

Key words: *Socio-economic conditions, Education background, WTP, Public higher education,*

1.0 Introduction

Financing and affordability of higher education is currently a public debate agenda in Tanzania. Higher education in Tanzania was historically free before the late 1980s, with the public covering both tuition and living expenses (Msolla, 2007). However, with economic difficulties and the increase of population and number of students completing secondary education, it became a burden for the government to provide free quality education, and hence the introduction of cost-sharing (Cutter, 2001). Funding of higher education in the context of cost-sharing policy is, therefore, supposed to be a shared responsibility between different stakeholders and beneficiaries of higher education products, but to an extent that they are able and willing to pay (Ishengoma, 2008; Ekanem *et al* 2012).

The main objective of this paper was, therefore, to establish the extent to which socio-economic conditions of the parents and students' education background influence ability and willingness to pay for higher education. Several studies had previously examined the impact of parents' socio-economic status and students' education background on willingness to pay. For instance, Zainal et al (2009) established that socio-economic status of a family was a benchmark for students in Malaysia to get financial aid in higher education, on top of their academic performance. To our knowledge, however, this is the first study for the case of Tanzania to investigate determinants of households' ability and willingness to pay for higher education of their children particularly in Dodoma Municipality. This study therefore, contributes to the filling of the gap and hence added knowledge to the literature.

2.0 Some briefs from Literature

2.1 Theoretical framework

Willingness to pay for a good or service is the maximum amount of money an individual would be willing to pay for a good or service (Niringiye *et al*, 2010). The study employed contingent valuation method (CVM) to elucidate households' willingness to pay user fees. A typical CVM involves a clear description of a good or service marketed to a sample of individuals, followed by questions on respondents' WTP for that good or service (Zilberman and Mara, 1993). In contrast to other inductive methods, respondents are not asked to rank or rate different alternatives, but are asked to choose one of the two scenarios presented. The choices observed from the experiments are analyzed using discrete (limited) choice models (Sanga and Hella, 2009).

CVM has been widely used (Carson, 2004), but has also been subjected to a number of criticism. It is argued that value mentioned by respondents is likely to be smaller in hypothetical situations compared to actual market situations. This is mentioned to lead to unrealistic values because uncertain respondents who are willing to pay something but do not have a precise estimate of their WTP may accept any reasonable suggestion (bid) offered in a dichotomous choice survey (Brown *et al*., 1996).

To resolve the bias arising from the use of hypothetical market, the study used close-ended questions as suggested by Cameron and James (1987) and Cameron (1988), followed by certainty follow-up questions. Furthermore, to reduce bias associated with close-ended questions, the study used cheap talk script to explain the consequence of not being truthful and certainty questions to make sure that only certain "Yes" is considered.

2.2 Conceptual framework

In this study a conceptual framework within which the probability of a respondent to say "Yes" or "No" to the WTP question was conceptualized to be conditioned by households' income level, occupations, family size, education level, marital status and students' former school background (*See appendix 1*).

2.3 Related empirical literature

Ability and willingness to pay fees for higher education of a child is jointly determined by socio-economic conditions of a family and students' education backgrounds. Hassle and Vesper (1993) established that parental saving for higher education of the child is determined by family income, family size, gender, race, parental education levels, marital status and students' academic strengths.

Wenli and Weifang (2001) found that willingness to pay for higher education of a child is positively affected by households' total income. They also established that parents who obtained more years of schooling pay more attention to children's education and have higher willingness to pay than those who spent few years.

Steelman and Powell (1991) established that probabilities of being able to pay for higher education decreased by 57% if the parent was unmarried and decreased by 14% for each additional child. They also found that parents whose occupations were well paid were more willing to invest in education of their children than those who were poorly paid.

Furthermore, it is assumed that parents who already provided financial support for their children to attend a private school were financially capable and willing to continue with this support in college. However, Steelman and Powell (1991) found no such effect.

3.0 Methodology Applied

3.1 Estimation model

The response to WTP question was binary which took the value of 1 if the response was "Yes" and 0 if the response was "No". Therefore, the study employed un-observed latent variable as an underlying propensity to WTP. To get consistent results, we employed probit model as suggested by Green *at al.,* (1995) to examine more rigorously whether or not households were different between the two lines of choices. The probit model was used instead of logit model because the conditional probability approaches zero or one at a slower rate in logit than in probit. However, many researchers choose the logit model because of its comparative mathematical simplicity (Gujarati, 2004)

The model used was of this form:

$$y_i = \begin{cases} 1 \text{ if } y_i^* > \pi \\ 0 \text{ if } y_i^* \leq \pi \end{cases} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

Where: π is the threshold of being different between the two lines of choices and y_i^* is the latent variable. As revived by Green (2003), the latent variable y_i^* is assumed to be linearly related with observed variables (x's) in the structural model, and is presented as:

$$y_i^* = \beta x_i + \varepsilon_i \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where: x is a vector of variables hypothesized to influence WTP, β is a vector of parameters estimated and ε_i is the random error term which is assumed to be normally distributed with zero mean and unit variance (i.e. $\varepsilon \approx N(0, \sigma = 1)$

The probability of observing household saying "Yes" (i.e. y = 1) was expressed as suggested by Long (1997)

$$\Pr(y_i = 1|x_i) = \Pr(y_i^* > 0|x_i) \Longrightarrow \Pr(y_i = 1|x_i) = \Pr(x_i\beta + \varepsilon_i > 0|x_i) \ldots (3)$$

The probability of an individual to be willing to pay fees for public higher education was estimated by using probit model such that;

$$\Pr(y = 1) = \exp(x_i\beta) / (1 + \exp(x_i\beta)) = 1 / (1 + \exp(x_i\beta)) \ldots\ldots\ldots (4)$$

The parameter estimated were interpreted as marginal effects, which indicate the effects of a marginal change of the variables conditioning willingness to pay user fees on the probability of say "Yes".

Therefore, the marginal effects were estimated as follows;

$$\delta \frac{\Pr(y = 1|x)}{\delta x_i} = \text{ø}(x_i\beta)\,\beta i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

Where: y is WTP taking the values of 0 and 1, x is a vector of factors that condition individual WTP, and β is a vector of variables estimated (Griffiths et. al1993; Wooldridge, 2001)
To get consistent and robust results, Maximum Likelihood (ML) was used for estimation as suggested by Green (1995). The ML estimates maximize the value of the probability density function *f(x, β)* and assumes normality of the disturbance term (Griffiths *et al*, 1993). ML estimates of coefficients estimated this way become consistent and asymptotically normally distributed. The assumption of asymptotic normality of distribution and consistency is known to give satisfactory results (Maddala, 1987).

3.2 Description of variables and model specification

Our dependent variable was WTP. The probability of a respondent to say "Yes" or "No" to the WTP question was conditioned by several factors including parents' income level, family size, occupations, education level, sex, marital status, students' former school background and the entire costs of schooling. These variables are described as follows:

Parents' education levels (PED) measured as (none, primary, secondary, tertiary) was included as a proxy for the capacity of the household to understand the importance of contributing user fees. WTP was expected to be positively related to parents' education levels.

Family income level (INC) measured in Tanzanian shillings per year was also included in the model to assess the financial strengths of the households. Family with high income backgrounds were expected to be more WTP than those with relatively low income and thus, a positive relationship was anticipated.

Family size (FAM) measured as the number of dependants was included because it was hypothesized to influence allocation of family income. Households with large number of dependants were anticipated to spend more on daily basic needs and probably less in education than households with small number of dependants.

Parents' marital status (MAR) measured as (married, widowed and divorced) was also included to assess if married parents differ from unmarried parents in matters related to education of their children. We anticipated married parents to be more WTP than unmarried.

The nature of parents' occupations (POC) measured as (entrepreneurs, employed, peasants) was also thought to influence WTP. We expected that parents with occupations that yield more earnings per year will be more likely to respond "Yes" to the WTP question than parents with occupations that yield few earnings.

Students' former school background (SCH) measured as (private or public) was also included in the estimation because it was hypothesised to influence WTP. Parents registered their children in private school were expected to contribute more for higher education of their children than those sent their children to public schools.

Sex of the respondents (RSEX) measured as (male or female) was included in the model to examine if fathers differ from mothers in financing higher education of their children. We anticipated males headed households to be more willing to pay than females.

The variable tuition fee (FEE) measured in Tanzania shillings per year was also included in our estimation as a payment vehicle. A negative link was expected between WTP and the amount of fees charged.

Our empirical model was therefore specified as:

$$WTP = \beta_0 + \beta_1 (PED) + \beta_2 (INC) + \beta_3 (FAM) + \beta_4 (MAR) + \beta_5 (POC) + \beta_6 (RSEX) + \beta_7 (SCH) + \beta_8 (FEE) + \varepsilon \quad (6)$$

Where:

WTP = willingness to pay part of college fees not covered by HESLB

β_0 = Intercept

β_i = parameters to be estimated

ε = Random error term

4.0 Data

4.1 The study area

The research was conducted in Dodoma municipality in 2012/2013. Dodoma municipality covers an area of about 2,669 square kilometers of which 625 square kilometers are urbanized. It is subdivided into 4 divisions which in turn are divided into 30 wards and 42 villages.

4.2 Data collection

We employed both purposive and simple random sampling techniques to select 120 household heads. Purposive sampling was used because only households with children in higher learning institutions were required to constitute a sample and simple random sampling was used in order to avoid bias and to ensure that each household with children in higher learning institutions had an equal chance of being selected.

Then we used self-administered questionnaires for data collection. We filled in a questionnaire by asking a respondent series of closed-ended questions. This typical questionnaire reduced the problem of low rate of return experienced in mailed questionnaires and it consumed less time and costs. Additionally, the closed- ended questions were preferred because they are easy to fill, save time and keep the respondents focused on the subject matter.

4.3 Descriptive Results

Descriptive results showed that out of 120 household heads interviewed, 107 (89%) were willing to pay for public higher education. In contrast, 13 (11%) were not able and willing to pay fees for college education of their children due to income poverty. These results were consistent with those of Ekanem *et al* (2012), who established that parents of graduating students were willing

to pay for the cost of schooling of their children in proportion to their socio-economic status.

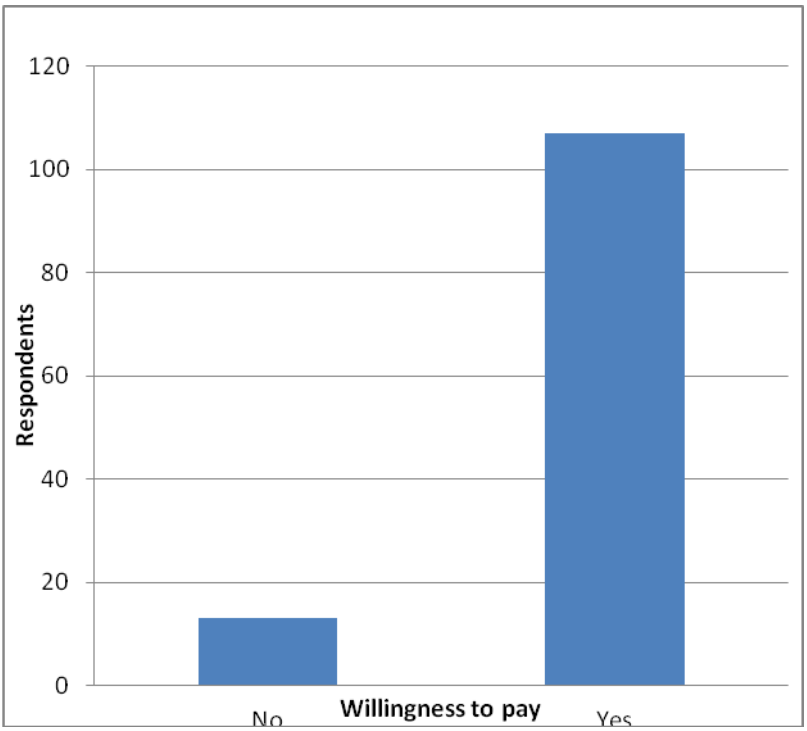

Figure 1: WTP for higher education

The mean WTP per student per annum was found out to be 335,000 Tsh. The mode and median were 240,000 and 300,000 Tsh. respectively. Moreover, the minimum and maximum fees that parents were able and willing to pay per student per annum were 70,000 and 900,000 Tsh. respectively as shown in Figure 2.

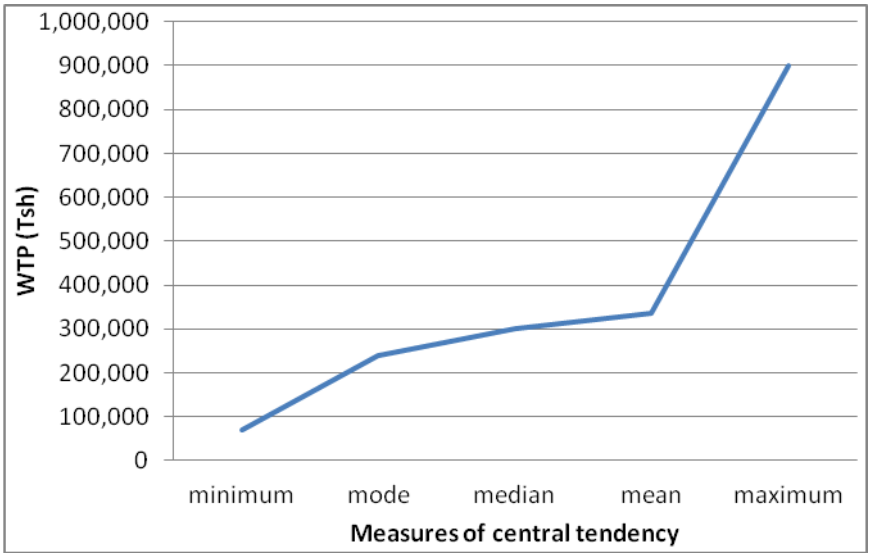

Figure 2: Measures of Central Tendency

5.0 Estimation Results and Discussion

Table 1 shows probit model estimation results. The signs of the estimated coefficients were generally consistent with our expectations. The coefficients for respondents' sex, marital status, income, education, family size, and tuition fees were statistically significant. In contrast, the coefficients for parents' occupations and schools attended by a child (private vs. public) were not statistically significant at 0.05 levels.

As shown in Table 1, the likelihood of being able and willing to pay for public higher education was significantly increased with income levels. Holding all other factors constant, the probability of being able to pay by households with relatively high income (3-6million) was higher by 0.08 percent as compared to households

with low income (less than 3million). The higher the incomes of the parents were, the higher the amount they were able and willing to pay. These outcomes were consistent with the outcome of Bank (2004), which revealed that parents of higher education students were willing to pay for the cost of schooling of their children in proportion to their earnings.

Ability and willingness to pay for university education was also affected by marital status of the parents. As depicted in Table 1, being widowed significantly decreased the likelihood of being able to pay for higher education of a child. Holding other factors constant, the probability of being able to pay was lower for widowed parents as compared to married parents by 7.0 percent. Therefore, loss of either parent or both of them implied not only social but also economical deprivation. Our results were correlated with the study by Steelman & Powell (1991) who asserted that probabilities of being able to pay for higher education are decreased by 57% if the parent is unmarried.

Table 1 also shows that sex of the respondents significantly influenced ability and willingness to pay for higher education of a child. The likelihood of being able and willing to pay for public higher education was higher for female headed households than their male counterparts. In other words, the probability of being able and willing to pay for mothers was higher by 0.03 percent as compared to fathers. However, this was inconsistence with Doss & Morris (2001) who established that male headed households are more probable to adopt or accept change due to resources ownership. Therefore, our findings present a challenge to current social scientific accounts that contend that fathers are more willing to pay for education of their children than mothers.

As depicted in Table 1, there was a significant relationship between costs of schooling and households' willingness to pay. Household heads were less likely to pay when tuition fees were

held at high rate (1.0-1.5 mil) than at relatively low rate (less than 1 mil), ceteris paribus. These findings were consistent with other findings by Ekanem et al (2012) who declared that when school charges increased by 200 percent, a higher percentage of parents under very poor income group are not willing to pay this increase for their children.

As depicted in Table 1, parents' education levels significantly influenced their willingness to sponsor their children. Holding all other factors constant, the probability of being able and willing to pay for higher education was lower by 95 % for parents with no formal education as compared to graduate parents. In the same vein, the likelihood of being able to pay was lower by 7.4 % for parents with primary education as compared to graduate parents. In overall, none graduate parents were less likely to pay than graduate parents. These results were also supported by Steelman & Powell (1991) who asserted that parents who pursued higher education themselves, their own experience in higher educational funding positively affect willingness to sponsor their children.

Parents' ability and willingness to contribute fees for higher education of their children was also affected by the size of a family. As displayed in Table 1, holding other conditions constant, the probability of being able to pay was higher for households with small family size of 2-5 members by 0.7 percent as compared to households with large family size of 10+ dependants. These findings were in line with Steelman & Powell (1991) who established that probability of being able and willing to pay for higher education is decreased by 14% for each additional child. This is because it is generally agreed that large family size coupled with low incomes restrict the opportunities of parents to educate all their children. Thus, population growth intensifies and exacerbates the economic and social problems

associated with the conditions of underdevelopment (Todaro, 2008).

The findings of the study confirmed that parents' occupation did not influence willingness to pay for children's education. It was how much a person received from his job (income) and not the type of job that conditioned ability and willingness to pay. These findings are not unique but rather support previous findings by the European Union (2001) that parents with occupations that yield more earnings per year are more willing to pay for college education than parents with occupations that yield fewer earnings.

Furthermore, findings of the study have shown that parents' ability and willingness to pay for university education was not affected by type of school attended by a child (private or public). These outcomes were consistent with Steelman & Powell (1991) who also found no such effect. These results present a challenge to the higher education students' loans board (HESLB) that contends that parents whose children had been to private schools are more capable and willing to pay for college education than parents whose children had never been to private schools.

Table 1: Probit Model Estimation Results: The Regressant is WTP

Regressors	Coefficients	P-values	Marginal effects
Sex			
[R] Male			
Female	1.8085	0.021**	0.00030
Marital status			
[R] Married			
Divorced	-1.1828	0.230	-0.00070
Widowed	-3.4202	0.001**	-0.07000
Occupation			

Regressors	Coefficients	P-values	Marginal effects
[R] Peasant			
Entrepreneur	-0.3244	0.727	-0.00003
Employed	-0.5824	0.732	-0.00006
Income (Tsh)			
[R] < 3mil			
3-6mil	2.5870	0.036**	0.00080
7+mil	0.2790	0.836	0.00001
Education			
[R] Tertiary			
Secondary	-5.0553	---------	-0.21410
Primary	-5.0142	0.002**	-0.07400
None	-6.5228	0.000**	-0.94640
Family size			
2-5	2.9437	0.023**	0.00740
6-9	1.1062	0.268	0.00004
[R] 10+			
Fees per year (Tsh)			
[R] <1mil			
1.0-1.5mil	-2.2210	0.016**	-0.00288
>1.5mil	-1.8404	0.113	-0.00433
School			
[R] Public			
Private	1.9475	0.124	0.00030
Constant	6.3203	0.000**	
No. of observations = 120			
LR chi2 (15) = 54.07			
Prob > chi2 = 0.0000			
Log likelihood = -14.1252			
Pseudo R2 =			

Regressors	Coefficients	P-values	Marginal effects
0.6568			

Note: [R] reference category and ** significant at 0.05 level

6.0 Concluding Remarks and Recommendations

This paper investigated determinants of households' willingness to pay for public higher education in Dodoma Municipality, Tanzania. The results showed that parents' marital status, income, education and family size significantly influenced WTP while parents' occupations and students' former school background were not found to change parents' WTP in neither direction. In addition, the results showed that, on average, parents were able and willing to pay Tsh. 335,000 per student per annum regardless of their socio-economic conditions.

It is thus recommended that the government through the Higher Education Students' Loans Board (HESLB) should not concentrate on parents' type of job as a major criterion for allocation of loans. Alternatively, it is recommended that the HESLB apply households' income levels as a major condition for loan allocation to the needy students. It is further recommended that the HESLB to abandon allocation of loans to applicants based on their former school background. Instead, it may wish to incorporate parents' education levels as a criterion for loan provision.

Moreover, except for the orphans, disabled and other deserving students who may be given scholarship (full higher education financing) in order to cushion the effect for equity in the university system, statistics from the study suggest that each student to contribute not less than Tsh. 70,000 and not more than Tsh. 900,000 per annum depending on socio-economic conditions of his/her family. Alternatively, all parents of the higher education students regardless of their socio-economic conditions and their children's education backgrounds may each uniformly and

affordably contribute an equal amount of Tsh. 335,000 per student per annum for education of their children.

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APPENDICES

Appendix 1

Conceptual framework of willingness to pay for public higher education