CHAPTER 6
DEMAND FOR HIGHER EDUCATION INSTITUTIONS AND ITS DETERMINANTS

The status and technical efficiency of the HEIs of Barak Valley is discussed in the preceding chapters, now it has become enviable to examine the significance of these factors from the perspective of society on the HEIs belonging to Barak Valley. The present chapter deals with demand for HEIs in Barak Valley along with its determinants and examines the relationship between efficiency and demand for HEIs in this region. This chapter is divided into three sections. Section 6.1 explains the enrollment scenario in the HEIs of Barak Valley in terms of both gross enrollment (E) and the applicant to enrolled ratio (AER) for explaining demand for HEIs in the region. Section 6.2 describes students' perspectives on different factors related to demand for higher education and demand for education institutions. Finally, section 6.3 illustrates the relationship between technical efficiency and demand for HEIs are explained.

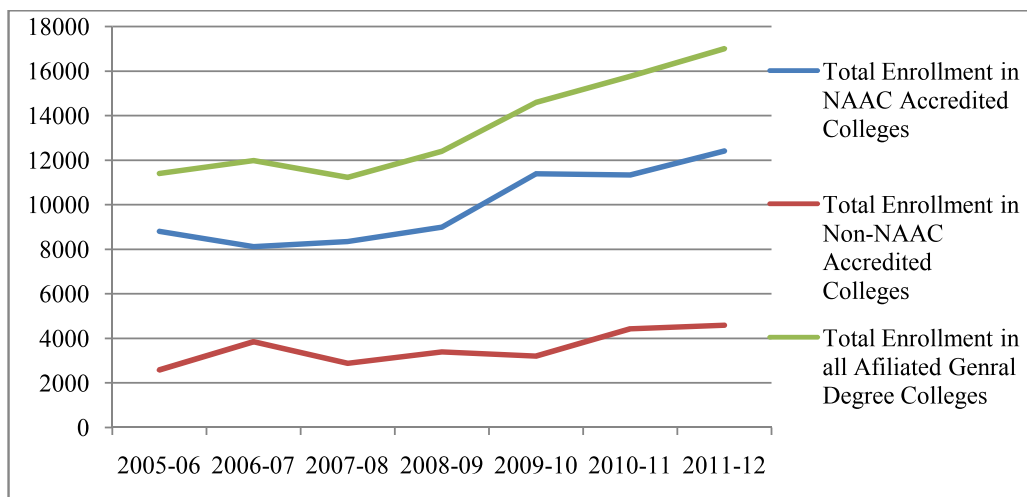## 6.1 Demand for Higher Education Institutions in Barak Valley

Predicting enrollment for a given college is analogous to forecast demand for an individual firm (Doyle and Cicarelli 1980). Enrollment data provide the most obvious source of information on demand for education. It is customary to express enrollment as a ratio of some relevant population group in order to measure the intensity or pervasiveness of demand for higher education within the relevant group (Robert and Siegel 1967). In addition to that the study also measures demand for these colleges by considering total enrollment as proxy for demand (Saiti and Prokopiadou 2008, Weiler 1987) and examines the association between technical efficiency and enrollment demand. While such ratios may be useful for some purposes, they are not useful for ours. We need a measure which

relates enrollments to those in a position to choose to go on to college at any particular point in time.

Enrollments in some public institutions are limited periodically by resources or other institutional constraints that limit the number of students the institution would accept to fewer than the applicants who meet widely posted admissions standards. An obvious problem in such circumstances is determining how many students are denied access. Finding this number clearly depends on the use of a procedure that correctly estimates the demand for attendance. This procedure includes both a proper specification of a model of enrollment determination and an appropriate estimation method for the specified model (Weiler1987).

In Barak Valley, total enrollment in the both NAAC accredited and non-accredited affiliated general degree colleges have shown a tremendous growth over the study period 2005-06 to 2011-12. Overall enrollment growth in all affiliated general degree colleges is 49.21 per cent which is 40.84 per cent in case of NAAC accredited colleges and 77.69 per cent non-NAAC accredited colleges.

Figure 6.1: Enrollments in HEIs of Barak Valley during 2005-06 to 2011-12

Source: *Assam University Annual Reports 2005-06 to 2011-12*

From the Figure 6.1, it is clear that enrollment in the colleges are showing positive trend over the study period which indicates increasing enrollment demand for higher education in the region.

Table 6.1: Enrollment in NAAC accredited and Non-accredited HEIs of Barak Valley

Sessions	Total Enrollment in HEIs	Total Enrollment		Share in Total Enrollment (in %)	
		NAAC Accredited Colleges	Non-NAAC Accredited Colleges	NAAC Accredited Colleges	Non-NAAC Accredited Colleges
2005-06	11393	8807	2586	77.30	22.70
2006-07	11975	8123	3852	67.83	32.17
2007-08	11224	8348	2876	74.38	25.62
2008-09	12397	8996	3401	72.57	27.43
2009-10	14591	11385	3206	78.03	21.97
2010-11	15758	11328	4430	71.89	28.11
2011-12	16999	12404	4595	72.97	27.03
Average during 2005-12	13477	9913	3564	73.56	26.44

Source: Assam University Annual Reports 2005-06 to 2011-12

It is observed that percentage of student's enrollment is higher in NAAC accredited colleges than the non-NAAC accredited colleges in each year. The average percentage of enrollment in NACC accredited colleges is 73.56 per cent over the study period, which is 26.44 per cent for the non-accredited colleges. This implies that these 13 accredited colleges serve major share of higher education enrollment. In Barak valley during 2005-06 more than 11,000 students were pursuing higher education in 30 general degree colleges of region. The share has shown ten per cent decline during the session 2006-07, while non-accredited colleges has shown ten per cent increase in enrollment during the same period. During the academic session 2009-10 enrollments in accredited colleges have increase to 11,385 from approximately 9000 during the session. Over all share of total students' strength is more than 70 per cent over 2005-06 to 2011-12 sessions. Hence, these

accredited colleges in spite of being small in number are contributing more to the society by producing more under graduate in the region.

Further for estimation of enrollment growth in the HEIs of Barak Valley over the sessions, least-squares growth rates estimation method is used in this study. This method is suitable and significant wherever there is a sufficiently long time series to permit a reliable calculation. The least-squares growth rate is estimated by fitting a linear regression trend line to the logarithmic annual values of the variable in the relevant period. The regression equation takes the following form which is equivalent to the logarithmic transformation of the compound growth equation:

$$ln\ E_t\ =\ \alpha\ +\ \beta t\ +\ e_t \qquad \text{Where } t = 1, 2, \ldots, 7.$$

In this equation E_t stands for enrollment in t-th time period, t is time, α and β are parameters. e_t indicates an error term which $e \sim N(0,\sigma^2)$. β is the average annual growth rate, and it is multiplied by 100 for obtaining the rate into percentage.

Table 6.2: Enrollment Growth in NAAC accredited and Non-accredited HEIs of Barak Valley

	Variables	Coefficients	Std Error	t values	P>|t|	Model Fit
Enrollment in NAAC Accredited HEIs	Time	0.072***	0.016	4.500	0.006	F(1,5) =20.24, Prob.>F =0.006
	Constant	8.903***	0.071	125.190	0.000	R^2= 0.802 Ad R2= 0.762
Enrollment in Non-NAAC Accredited HEIs	Time	0.075***	0.029	2.600	0.048	F(1,5) = 6.75, Prob.> F=0.048
	Constant	7.857***	0.130	60.510	0.000	R^2=0.5746 Adj.R2=0.450
Enrollment in both Accredited & non-accredited HEIs	Time	0.072***	0.012	7.920	0.002	F(1,5) = 33.31, Prob.>F =0.002
	Constant	9.209***	0.053	172.160	0.000	R^2= 0.8695 Adj.R^2=0.8434

Source: Assam University Annual Reports 2005-06 to 2011-12

Table 6.2 shows enrollment growth in the colleges of Barak Valley over the session 2005-06 to 2011-12 with the help of Least Square estimation technique. The model estimates the enrollment growth for NAAC accredited and non-accredited are significant in explaining positive variation in total enrollment in with respect to time. Over the study period it is observed that enrollment in the HEIs of Barak Valley has increased by 7.2 per cent. The enrollment growth of NAAC accredited HEIs is 7.2 per cent during the study period and is 7.5 per cent for non-accredited HEIs. Hence, it is argued that there is a significant rise in enrollment in the HEIs of Barak Valley.

To examine the significant demand for the HEIs of the region applicant to enrollment ratio (AER) is taken as proxy for demand for the HEIs. Further one-sample t test for assumed mean value of applicant to enrollment ratio (AER=1) at entry level in the HEIs of the region is tested in this study. A greater value of AER denotes higher demand and a value closer to one denotes lower demand of the HEI.

Table 6.3: Applicant to Enrollment Ratio in the HEIs of Barak Valley

Applicant to Enrollment Ratio (AER)	Descriptive Statistics				One-Sample t Test for AER = 1		
	N	Mean	Std. Deviation	Std. Error Mean	Mean Difference	t	Sig. (2-tailed)
All HEIs	30	1.0862	0.14747	0.02692	0.0862***	3.202	0.003
NAAC Accredited HEIs	13	1.1906	0.17656	0.04897	0.19065***	3.893	0.002
Non-NAAC Accredited HEIs	17	1.0063	0.01921	0.00466	0.0063	1.353	0.195

Source: Primary Data from the HEIs during September 2012 to September 2013 and AUS Annual Report
*Note: *** denotes estimates are significant at less than one percent level of significant.*

Table 6.3 shows the mean and standard deviation of AER in the HEIs of Barak Valley along with test statistic against the assumed mean AER equals to one. The mean value of AER in accredited HEIs is comparatively higher than that in non-accredited

colleges, which implies that demand for accredited HEIs in this region is more than non-accredited colleges. The results of One-Sample t Test for all HEIs and NAAC accredited HEIs are significant at less than one per cent level of significance, while insignificant for non-accredited HEIs. However, deviation of actual mean from assumed mean (AER=1) is positive for all the cases, which implies that there is considerable demand for higher education in the region.

6.1.1 Factors Influencing Demand for Higher Education Institutions

There are several determinants that influence enrollment demand for higher education. However when analysis is restricted to institution specific factors it always clusters around supply constrains related to infrastructural facilities associated with seat capacity. In this study location of the HEIs, measured in terms of urban locational dummy with value one for established in urban area and zero otherwise, past performance of the HEIs measured in terms of weighted performance index of previous year and teacher quality measured in terms of TQI (already mentioned in Chapter 4) of the HEIs are considered as independent variables in study. All these three factors are expected to have positive impact on demand for higher education institution in a region. In this study number of applicants to enrolled students (admitted in first year) ratio in a particular HEI in a year is taken as measure of demand for higher education at institution level. The higher value of applicants to enrolled students ratio of any institution shows higher demand for that institution because many students are willing to admit in that institution per enrolled student. Enrollment can be maximum if the seat capacity is fully filled up. Sometimes, number of enrollment can be lesser than the seat capacity if the institution restricts the enrollment to control the quality of the institution. In both these cases, this number of applicants to enrolled students' ratio proxies the demand for institution. This is

measured by debiting total number of application resaved by total enrollment for each college.

To analyze the influence of selected factors on demand for HEIs, following linear regression model (already mentioned in equation 15 in Chapter 3) is used in this study.

$$AER_i = \beta_0 + \beta_1 LD_i + \beta_2 PP_i + \beta_3 TQI_i + e_i$$

Where, AER_i stands for applicants to enrollment ratio in the ith HEI, LD, PP and TQI stand for location of the college, past performance and teachers quality index of the ith HEI respectively. β_0, β_1 and β_3 are the parameters, e_i is error term which $e \sim N(0, \sigma^2)$. This equation is estimated for 30 HEIs of the region; however group-wise estimation is not used here due to the problems of degrees of freedom with few observations in this cross-section analysis. The influencing factors for demand higher educational institutions are shown in Table 6.3.

Table 6.3: Determinants of Demand for Higher Education Institutions in Barak Valley

Variables	Coefficients	Standard Error	t	P>|t|	Model Fit
Constant	0.988***	0.021	46.560	0.000	F(3, 26) = 22.30
LD	0.136**	0.056	2.430	0.022	Prob. > F = 0.000
PP	0.004*	0.002	1.900	0.069	R-squared = 0.720
TQI	0.172**	0.081	2.130	0.043	Adj. R-squared = 0.688
					No. of observations= 30

Source: Assam University Annual Reports and Primary data from the colleges during September 2012 to September 2013

Table 6.3 shows that all these selected variables have positive influence on demand for higher education institution in Barak Valley, and these variables are explaining more than 72 per cent variation in demand for HEIs in region. The coefficient of location dummy is significant at less than five percent with positive sign. This implies that colleges situated in urban area are more demanded as centre of higher education that that of

colleges belonging to rural areas. This may be due to the reason that colleges situated in urban areas are more efficient and have prosper infrastructure as compare to those situated in rural areas. The coefficient of past performance of the HEIs is positively significant at less than ten per cent level of significance. This implies that colleges with good past result are attractive more students in this region. This may be due the region that this students of these colleges are attracted by previous results which is and obviously.

6.2. Demand for Higher Education from Students' Perspective

Demand for higher education from students' point of view in reality is a derived demand for satisfactory job (high wage employment) opportunities in the country. However, cost of pursuing higher education and background of the students have also great influence on it. Thus, demand for higher education depends on three important factors viz: i) the family's private benefit of education (expecting to get a better paying job), ii) the educational costs, both direct and indirect that a student or family must bear it, and iii) students' socio-economic background (Todaro and Smith 2008). Hence, in the study further attempted to analyze students' perspectives related to reasons for pursing higher education and selection of their HEIs education.

From the sample of 200 students, 56 per cent are honours graduate while 44 per cent are simple graduate with pass course, 68 per cent are female and 32 per cent are male, 78 per cent are Hindu, 20.5 per cent are Muslims and only two per cent are Christians. From all these religions 58.5 per cent belong to general category while 29 per cent are from other backward caste (OBC), nine per cent and 3.5 per cent are from schedule caste (SC) and (ST) category respectively.

To identify the main reasons for the high demand for higher education, some questions were asked to the students. In response to those questions, the students have

replied that there is no single reason rather there are several reasons for pursuing higher education which are mentioned in the following Table 6.4.

Table 6.4: Factor Influencing Demand for Higher Education

Sl. No.	Reasons for Pursuing Higher Education	Response (in %)
1	Career Development and a better job (Q1)	95.00
2	Acquisition of Knowledge (Q2)	90.50
3	Social Status (Q3)	63.00
4	Subject Specialist (Q4)	85.00
5	Following Siblings (Q5)	55.00
6	Own Desire for Self Development (Q6)	88.00
7	Peer Group Effect (Q7)	54.00
8	Influence by School environment (Q8)	72.50

Source: Primary data from the field survey during January 2014 to April 2014 at AUS campus

Higher education usually offers more opportunities for their career development and a better job; hence 95 per cent of the students of Barak Valley have opined this factor as the prime reason for pursuing higher education. 90.5 per cent students are agreed higher education improves student's quality through acquisition of knowledge. Social status attached with higher degrees in society strongly persuades students to take decision for higher education, 63 per cent students of Barak Valley go for higher education due to this reason. 88 per cent students are agreed that higher education is their top priority due to their strong desire to continue their education in institutions of higher education for self development. In Barak Valley it is also found that influence of school environment or previous education institutions' environment is also another important factor which provokes the students to go for further education and 72.5 per cent of the students are agreed with the reason. While 55 per cent students choose higher education also because they are following their siblings who have pursued higher education and 54 per cent students choose due to peer group effect.

Hence, among the several factors related to demand for higher education, students of Barak Valley strongly support the reasons that career development and a better job, acquisition of knowledge and own desire for self development are the leading determinants at this point of time. However while questioning regarding reasons for pursuing general higher education rather than technical or vocational; 88.5 per cent opined that their desire to gather deep knowledge about the subjects is the main reason, while 43.5 per cent agreed with the reason that their parental income is not sufficient to go for other technical education as that needs more money and 29.5 per cent stated other reasons like low percentage in their past examination, family's choice, distance and other expenses related to professional education, security concern in other places beyond home town specially for female students etc. have influenced some of the students to not go for professional education.

Reasons for demand for pursuing higher education for different socio-economic and academic groups are shown in Table 6.4A (Appendix), where variations in opinion in favour the reasons for pursuing higher education for different groups are depicted. Better job opportunity and for acquiring knowledge are found strong determinants of the demand for higher education for different socio-economic and academic groups and there is no significant variation in the opinions of the respondents for these reasons. There is a variation in opinion between social science group and natural science group of students about the social status as a reason for demand for higher education. In case of honours students approximately 60 per cent of students support the reason of social status while approximately 66 per cent pass course students are agreed with this reason. To know a subject more intensively as a factor of higher education is strongly supported by all socio-economic and academic group while a significant variation is observed in terms of religious groups where Hindu students are in more support of the reason. Influence by

siblings as a reason for higher education is moderately supported by all the groups and variation in opinion is significantly observed for male-female and pass-honours students in this region. Here female students are more influenced by their siblings, rather than male students and pass course students are more strongly in support of this reason than honour students. Own desire for self development as a reason for higher education majority of the groups are in strong support, while approximately seven per cent variation is observed between opinion of honours and pass students; and eight per cent variation is observed between natural science and social science students. All though peer group effect is belied to be moderately influencing desire for higher education, a considerable amount of variation is observed for this reason among different academic groups. In this study social science students are strongly agreed with this reason unlike natural science students and pass score students are also in strongly favour of this reason compare to honours student. This implies that students pursuing graduation in social science and those with pass score are strongly influenced by their friends. Among different caste a moderate number of students belong in to general category are in support of this factor while, students belong in to OBC category are more in favour of the reason.

6.2.1 Demand for Higher Education Institutions in Barak Valley: Students' Perspective

In Barak Valley it is found that 80.5 per cent of the students chose education institution for higher education considering quality and availability of teachers in that institution, 72.5 per cent consider the past performance of that institution before selection a higher education institution or college for higher education. Regularity of classes in an institution is easily accessible information that can be collected from the senior batch students and accordingly students are willing to choose that factor for considering a strong reason for selection of their college, hence 77 per cent students are agreed with this reason. 76 per cent students believe that academic environment is an important factor for

enrollment in higher education while 70.5 per cent believe in quality of library facility of this institution for selection of an institution (Table 6.5).

Table 6.5: Factors Influencing Demand for Higher Education Institutions

Sl. No.	Reasons for Selection Higher Education Institutions	Response (in per cent)
1	Near to your residence (R1)	62.50
2	Low fees structure (R2)	40.50
3	Good quality& number of teachers (R3)	80.50
4	Self Selection (R4)	71.50
5	Parental Decision (R5)	56.00
6	Influence of Peer group (R6)	19.50
7	Reputation attached with it (R7)	63.00
8	More options of subject (R8)	56.50
9	Regularity of classes (R9)	77.00
10	Good Library Facility (R10)	70.50
11	Good academic environment (R11)	76.00
12	Good past records in terms of results (R12)	72.50

Source: Primary data from the field survey during January 2014 to April 2014 at AUS campus

Parental involvement and family pressure were perceived neither as strong, nor as an influential factor on the student's decision to continue their studies in higher education, at least according to the response (Saiti and Prokopiadou 2008) and hence also regarding the selection of HEIs. However, in Barak Valley 56 per cent of the students are considered family advice as one of the source of influence on their decision to follow HEIs according to their choice. A high percentage of the respondents (63.5 per cent) believed that reputation of a college is also important regarding selection at the time of admission. Moreover, students stated that they would be prepared to drop their chosen subject to follow a different field of study, despite their preferences and hence 56 per cent agreed with the reason that colleges offering more subjects attracts more students. Peer group

influence (19.5 per cent) and low fees structure (40.5 per cent) are the two least preferred reasons for selection of HEIs by students. Hence, it can be argued that very few numbers of students follow their fellow mates at time of selection of HEI and majority of the students believe that the general degree colleges of Barak valley are charging a comparatively high fees structure.

Differences in opinion regarding selection of HEIs for different socio-economic and academic students groups are shown in Table 6.5A (Appendix). Here, it is found that distance plays an essential role in determining demand for higher education intuition in this study. It is also found that distance form residences of the students are more affecting female students than male students. Income is related to expenditure on education and any other area, however here students with annual income more than mean income are in more support of the reason rather than those whose residents are far from the HEI. Honours students are comparatively less influenced by distance factors regarding selection of their college than pass score students. This implies that distance from the resident of the students is not that much significant determinant of demand for HEIs from the students' perspective. Students are choosing an institution for their higher studies comparing other factors rather than distance. Fees structure of majority of the college in this region is almost same as all this colleges under same university and hence majority of the students are not in support of this factor. However divergence in opinion for this reason is observed for male-female students, impaling a piece of evidence that male students are more in support of the reason than female students and only 37 per cent of Hindu are in support of the reason while approximately 50 per cent students of other religions are choosing HEI by considering low fees structure. Good quality and more number of teachers, regularity of classes in the particular HEI, good library facility and academic environment of the HEIs from the students' perspective are found important factor for selection of HEIs, however

there is no considerable difference in opinion across different socio-economic and academic groups in this study.

Selection of the HEIs by students' owns choice is stronger for male students and natural science students. Again for female students more than 60 per cent are in support of the factor that parental decision is strongly affecting the selection of colleges for higher education compare to male students. Again a considerable amount of variation is observed for honours-pass students, students of natural and social science this implies that opinion related to selection of the HEIs by parental choice is not only influenced by social factor but also academic factors as well. Students with low annual income are more in support of their parental selection unlike students with higher average annual income. Influence of peer group as a factor for demand for HEIs is comparatively less supported by students of this region. While significant difference is observed for natural science to social science students and students of pass course is more influenced by peer group than honour students. This implies that students of social science and pass course graduate students are more influenced by peer group than that of natural science. Students belonging to higher income family and students belong in to Hindu religion are in favour of the reason that reputation attached with HEIs as stronger determinants of demand for HEIs. Female students and social science students are comparatively prefers more options of subject and hence are more in support of the reason than others. Again students with higher annual income are strongly believed in selection of HEIs as per the number of subject offered to them. Good past records in terms of results backups in attracting good number of students in any education institution. Here, students belonging to higher family income are considering past performance of the HEIs before selection for addition compare to lower income group students. While majority of the students from different socio-economic an

academic background are strongly considering past performance of the HEIs as determining factors for selection for further studies.

6.3 Technical Efficiency and Demand for HEIs in Barak Valley

In order to check the relationship between technical efficiency and demand for higher education institutions in Barak Valley Pearson's correlation coefficients is used in this study and shown in following Table 6.6.

Table 6.6 Correlation Coefficients of Demand and Technical Efficiency measures for the HEIs of Barak Valley

Pearson Correlations	Applicant to Enrollment Ratio	Average Enrollment
CRS_G	0.147	0.417**
	(0.463)	(0.030)
VRS_G	0.283	0.602***
	(0.153)	(0.001)
SFA_G	0.694***	0.664***
	(0.000)	(0.000)
CRS_C	0.145	0.567***
	(0.470)	(0.002)
VRS_C	0.192	0.440**
	(0.338)	(0.022)
SFA_C	0.676***	0.582***
	(0.000)	(0.001)
ATEFFI	0.378*	0.635***
	(0.052)	(0.000)
EFFIINDX	0.543***	0.694***
	(0.003)	(0.000)
SFA_{2012}	0.431**	0.123
	(0.025)	(0.539)
CRS_{2012}	0.073	0.514***
	(0.719)	(0.006)
VRS_{2012}	0.227	0.475**
	(0.254)	(0.012)

Source: Compiled from Assam University Annual Reports and Primary data from the colleges during September 2012- September 2013
Note: Subscripts G and C denote group wise and combined data over 2005-06 to 2011-12 estimates, and subscript 2012 denotes estimated result for 2011-12 session of the HEIs of Barak Valley.
***, ** and * denote coefficients are significant at one, five and 10 percent level of significance respectively. Parentheses in bracket denotes p values of the coefficients

Table 6.6 reveals correlation coefficients of technical efficiency estimates with applicant to enrollment ratio and average enrollment. Applicant to enrollment ratio is found positively related with all the technically estimates for this region, however significant for stochastic frontier estimates and composite efficiency indices. The coefficients of correlation with composite technical efficiency indices are positively significant and moderately related applicant to enrollment ratio, while moderately high and significant in case of SFA estimates. On the other hand correlation coefficients of average enrollment of the HEIs with most of the technical efficiency estimates are positively related and statistically significant here. This implies that technical efficiency and demand for education is positively related with moderate degree of association. This finding is pretty expected as higher demand for any higher education institution generally associated with screening of good quality students in the particular institution which further contributes in better performance of the HEIs and ultimately reduces inefficiency. Again on another side technically efficient HEI with better performance are attracting more number of students and thus generating higher demand for that institution. Hence, it can be said that affiliated general degree colleges of Barak Valley can increase their demand by increasing efficiency and with higher demand they can further move up their efficiency.

The study reveals a significant demand for higher education in the region and there are several institution specific and student specific factors influencing demand for HEIs here. Further the measurement of correlation coefficient between technical efficiency and demand for HEIs is also found significant for the region implying a suggestion that affiliated general degree colleges of Barak Valley may increase their demand by increasing efficiency and with higher demand they may raise their technical efficiency.