

Statistical Analysis of the Impact of Education Loan on Enrollments in Higher Education in India

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Abstract— The education loan is a major financial support for access to higher education. Quality education is a must for a complete and successful life. For many, it is equivalent to graduating from reputed and well-established institutions. According to studies, education costs are increasing at an average of 10-12% per annum. Despite the saving tendency of people in India, one may still encounter a shortage of funds. An education loan, therefore, plays a vital role in such a scenario by helping to bridge the gap between the shortfall and the required amount. The demand for education loans increased with an increase in GDP. In this paper, the growth in loans taken by the students in higher education has been analyzed statistically based on various parameters such as students' enrollment, gender parity index, loan outstanding amount, and number of loan accounts. Statistical methods such as correlation, regression, and tests of hypothesis have been used computationally for this analysis. This paper concludes that with the increase in the ratio of loans taken, there is also an increase in gross enrolment ratio and the gender parity index. There is a huge amount of loans which is outstanding and need further investigation. There are many states which has a very low number of education loan accounts, which is an indication of a lack of balance of higher education accessibility across the states in India.

Index Terms— Higher Education, Education Loan, Correlation, Test of hypothesis, chi square, ranking.

I. INTRODUCTION

Almost all the countries across the world support education through various schemes, including scholarships, loans, subsidies, or full sponsorship. Government of Australia support students through its HELP scheme [1]. Student loans is one altogether the selection sources of financing activity for the credit constrained students. Capital market failure occurs because students are unable to urge loans by pledging future earnings as collateral. Student loans by scheduled commercial banks in India is a shot to ease out the capital market imperfections. Apart from the lender and borrower, credit markets for activity involves uncertainty at different stages-viz., becoming a successful student, becoming a graduate, an employee and also the one who repays loans regularly, which is relied on his future earnings. If left to the market, there'll be efficiency loss (as the talented but credit constrained students from poor family backgrounds would be unable to access higher education) and would end in distributional inequalities. Hence, the role of presidency in activity financing is justified.

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Also one altogether the foremost objectives of education policy in India is providing equality of educational opportunities and also student loan program in India. In 2001 the Indian Banks Association have come up with a model frame work for educational loans within the country. With the approval of the Central Government the overall public sector banks in India began to administer education loans. It has been analysed that there are very few education loan.

Srivastava [2] studied the intention of the students to repay the loans, and Khanwalker [3] studied on banks declaring these loans as 'Non-performing assets' due to not paying the loans by the students. This has become a challenge for the students as well as for the banks, and overall the Indian economy.

The educational system in India, a prominent developing country, is predominantly a state-funded and state-controlled activity. Given the financial constraints of various Indian states, it's become difficult to satisfy the ever-increasing financial needs of an expanding education system. The higher education system in India is the third largest after the us and China [4]. Gethe and Hulage [5] analysed the experience of the students who took education loans from different banks in India, and found that this experience is not affected with the type of bank providing the loans. with none doubt the Indian educational activity system has been growing rapidly, covering all the most important disciplines, and to a good extent, meeting the manpower requirements of India. It covers arts and science colleges, medical and engineering colleges, agricultural, pharmacy and management schools.

This paper is aimed to analyse the importance of education loan in ensuring access to quality education for all. In we also check with increment in importance is demand for it also increasing or not. We do check for education loan amount and done state wise analysis of education loan account.

II. METHODOLOGY

Dataset

Data on ratio of loan taken to number of students enroll is taken because this can easily clear us the importance of education loan in society. There is also data of gender parity index and enrollment ratio so there can be easy comparison between the data and also the check dependability. The data is taken for the year 2000 because scheme for education loan is implemented by government in 2000, and source of the data is the data portal of Government of India

Pearson Correlation

Correlation measures and describe the strength and direction of the relationship. Positive correlation signifies that on

increment of one value there is also increase in another value whereas in negative correlation signifies that there is decrement of one value on the increment of another value. The correlation coefficient is (r) and the value of (r) lies between -1 to 1. The formula for finding the correlation is

$$r = \frac{S_{xy}}{\sqrt{S_{xx}S_{yy}}}$$

$$S_{xy} = \sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y}) \quad ; \quad S_{xx} = \sum_{i=1}^n (x_i - \bar{x})^2 \quad ;$$

$$S_{yy} = \sum_{i=1}^n (y_i - \bar{y})^2$$

Regression

Regression indicates the degree to which the variation in one variable X, is related to or can be explained by the variation another variable Y. Once knowing there is a significant linear correlation it is easy to write an equation describing the relationship between the x and y variables.

The equation of the simple linear regression line can be written as:

$$h(x_i) = \beta_0 + \beta_1 x_i$$

where,

h(x_i) is equal to the predicted response value (dependent variable)

b₀ indicated the y-intercept of the line

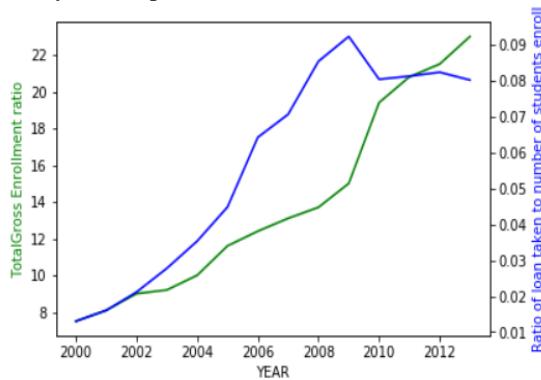


Figure 1: Twin Plot graph

The correlation coefficient between the ratio of loan taken to number of enrol and gender parity index is **0.87**, which signifies that increase in gender parity index has a Big and Positive impact on ratio loan taken to number of students enrol or vice versa. The graph to show correlation is available in Figure 2.

Regression

The regression equation between ratio of loan taken to number of students enrol and gross enrolment ratio. From this I have seen that on continuous increment of

b₁ represents the slope of the regression line.

where, $\beta_1 = \frac{SS_{xy}}{SS_{xx}}$ $\beta_0 = \bar{y} - \beta_1 \bar{x}$

Power method

Power method is used to determine the eigen vectors for the dominating eigen values for a give matrix. If a matrix A has a dominant eigenvalue with corresponding eigenvectors, then we choose an initial approximation of one of these eigenvectors of A. This initial approximation must be a nonzero vector in R_n. Following an iterative process, we find a final eigen vector and we may decide upon rankings of the rows of the matrix based on the values of eigen vectors by keeping them in either descending order.

For large powers of k, and by properly scaling this sequence, we will see that we obtain a good approximation of the dominant eigenvector of A

III. RESULT AND DISCUSSION

Correlation

The correlation coefficient between the ratio of loan taken to number of enrol and gross enrolment ratio is **0.83**, which signifies that ration of loan taken has positive impact on number of enrolment or vice versa. The graph to show correlation is available in Figure 1.

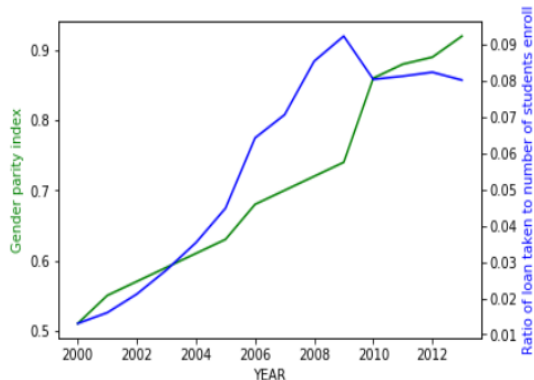


Figure 2: Twin Plot graph

ratio of loan take there is also an increment in gross enrolment ratio. Following is the line of regression obtained from the data.

$$y = 150.81 * x + 5.32$$

x: Ratio of loan taken to number of students enrolled, y: Gross enrolment ratio

The Regression curve is available in Figure 3.

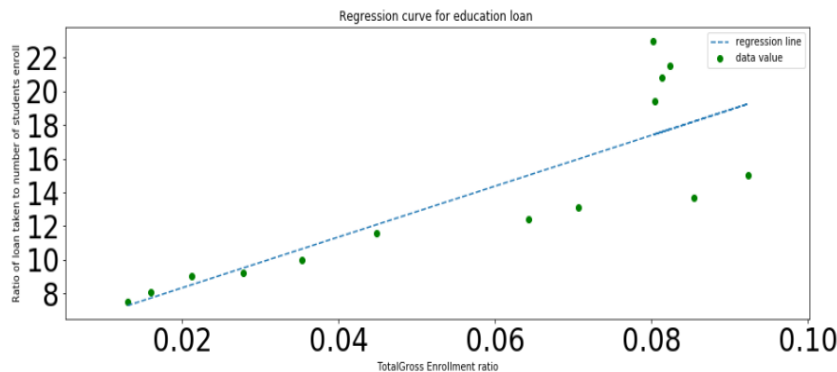


Figure 3. Regression curve Ranking (using power method)

To rank the states based on the number of loans sanctioned, power method is applied using Python programming. This is based on the loans from 2011 to 2012. Following is the order of the states.

Telangana	Jammu and Kashmir
Kerala	Karnataka
Madhya Pradesh	Delhi
Manipur	Mizoram
Maharashtra	Tamil Nadu
Puducherry	Assam
Andhra Pradesh	West Bengal
Uttarakhand	Jharkhand
Uttar Pradesh	Nagaland
Rajasthan	Odisha
Haryana	Meghalaya
Chhatisgarh	Dadra and Nagar Haveli
Himachal Pradesh	Chandigarh
Sikkim	Gujarat
Punjab	
Bihar	

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This analysis clearly indicates that Telangana had maximum number of education loan and Gujarat had minimum number of education loan.

IV. CONCLUSION:

The importance of education loan in the increment of enrolment rate in higher institution has been discussed in this paper. Following are the conclusion that can be drawn from this paper.

1. Education loans affects the student enrolments strongly in positive way, i.e., the governments may announce more such schemes to increase the student enrolments in higher education.
2. There is a linear trend between the growth in the education loans and growth in the student enrolment.
3. There is a difference in behaviour of education loans across the states irrespective of population. The state governments may run some awareness drives to encourage student to avail this support to pursue quality education for their better career.

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