Ranking of Indian Universities: A Study of the Subjective and Objective Perspectives

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National Institutional Ranking Framework (NIRF) ranks Indian universities on the basis of certain 'objective' and 'subjective' factors. A deep look at these factors enables us to segregate them into distinct inputs and outputs and carry out non-parametric data envelopment analysis (DEA). The rankings that we arrive at vary a lot from the NIRF ranking. This divergence seems more prominent when gazed through the lenses of partial analysis. Efficiency results show little difference between 'objective' and 'subjective' studies. However, it points out to the scope for huge improvement in the university education outcome with the existing resources. On top of all these ranking episodes, the broad bleak spectrum in education arena still remains neglected.

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JEL: *I21, I23, D24*

I. Introduction

It has been a popular practice these days to rank higher educational institutes. Grades or rating provided by a prestigious and authentic agency aid all the associated stakeholders, particularly the students in their decision making. Also the educational administrators, policy makers and the academicians can effectively use these ranks in enhancing the overall quality of education in the country. In present time, ranking does not only have huge influence in the areas of higher education but also on the society at large (Qamar 2018; Hazelkorn 2019).

Though ranking of a higher educational institute from a reputable agency is greeted with huge fanfare, it often has some lacunae too. Sometimes the metrics used and the methods applied are faced with criticisms. Again, these judgments are sometimes are suffering from the enigma of subjectivity or biasness (Porzionato and Marco 2015).

Here in this paper we concentrate on the NIRF rankings of the top 100 universities of the country under the aegis of the Ministry of Education1, Government of India and try to see the influence of 'subjective' and 'objective' evaluation from the efficiency perspectives. NIRF ranks the universities both on 'subjective' and 'objective' parameters. Importantly, the several 'objective' and 'subjective' factors used in NIRF ranking system can also be thought of as inputs and outputs, providing us scope for applying non-parametric DEA technique. In this paper, in section II, we briefly describe about the data that we use for our analysis. The methodology part has also been dealt with here in a succinct way. In section III, the findings of the DEA-based efficiency analysis and a comparative study of the NIRF ranking and non-parametric 'subjective' and 'objective' rakings are made. Finally, in section IV, we conclude.

II. Data Source and Methodology

NIRF ranks the universities on the basis of these four 'objective' parameters -Teaching, Learning & Resources ("TLR"), Graduation Outcomes ("GO"), Research and Professional Practice ("RP"), Outreach and Inclusivity ("OI") and on the basis of the 'subjective' parameters - Perception ("PR") (GOI 2O17). However, we see a distinct division of these parameters into inputs and outputs. This allows us to carry out non-parametric data envelopment analysis. Quite understandably, the parameters 'Teaching, Learning & Resources' and 'Outreach and Inclusivity' can be thought of as inputs while the parameters 'Research and Professional Practice', 'Graduation Outcomes' and 'Perception' can be considered as outputs. The addition or deletion of the parameter 'Perception' adds 'subjectivity' or 'objectivity' to our efficiency studies. Inputs remaining the same, Model A, which can also be called as objective efficiency model, considers 'Research and Professional Practice', 'Graduation Outcomes' as the two outputs. In Model B, i.e., the subjective efficiency model includes 'Perception' as the third output, the two inputs remaining unaltered.

Once the selection of inputs and outputs are done, we can carry out the non-parametric DEA, the idea of which was first propounded by Farrell (1957). The idea received much popularity even since the publication of the seminal work by Charnes, Cooper and Rhodes (1978) and Banker, Charnes and Cooper (1984). Following Ray (2004), consider 'N' decision making units, each of which producing 'm' number of outputs with 'n' number of inputs. The input and output bundles are given by –

$u_t = (u_{1t}, u_{2t}, \ldots, u_{nt})$ and $v_t = (v_{1t}, v_{2t}, \ldots, v_{mt})$

Under constant returns to scale (CRS) if (u,v) is feasible then for any $\beta \geq 0, (\beta u, \beta v)$is also feasible. Under CRS, the production possibility set can be given as–

$$T^{CRS} = \{(u, v): u \geq \sum_{j=1}^{N} \alpha_j u^j; v \leq \sum_{j=1}^{N} \alpha_j v^j; \alpha_j \geq 0; (j = 1, \ldots, N\} \ldots\ldots\ldots(1)$$

Here α_j is feasible and is ≥ 0 for all j.

For any decision making unit, for output oriented technical efficiency, the following linear programming problem has to be solved –

Max Ω

Subject to $\sum_{j=1}^{N} \alpha_j v_{rj} \geq \phi y_{rt}$; (r=1, 2,….,m)

$$\sum_{j=1}^{N} \alpha_j u_{ij} \leq u_{it}; \quad (r=1, 2,\ldots.,m)\ldots\ldots\ldots\ldots\ldots\ldots(2)$$

$\sum_{j=1}^{N} \alpha_j = 1, \quad \alpha_j \geq 0. \ (j = 1, 2, \ldots, N)$ .....(3)

Given maximum value of Ω which is given Ω^* , the output oriented technical efficiency of firm t can be obtained by solving the equation (4)

TE=1/Ω^* ..... (4)

III. Subjective & Objective Efficiency Results vis-a-vis NIRF Ranking

First of all, we look at some of the basic statistics pertaining to the '*objective*' (Model A) and '*subjective*' (Model B) efficiency scores that we derive by efficiency technique. We see that in both the models, the average efficiency score is moderate (about 0.70) and there is a lot of scope to improve the performance even with the existing set up (Table 1). However, we do not find any serious departature in the efficiency scores in the two models implying that the inclusion of the '*subjective*' factor does not bring any discernible change in the efficiency outcome.

Next we construct a frequency distribution (Table 2) of the efficiency scores. We find that in both the models, only 11% of the universities obtain an efficiency score of over 0.9. Again, we see that in 81% of the universities in the objective efficiency model (and 82% of universities in the subjective efficiency model) has an efficiency score in the moderate range of 0.5 to 0.9. In model A, 8% (and model B, 7%), of the universities have poor efficiency score (less than 0.5). [2]

Table 1: Some Basic Statistics of Subjective & Objective Efficiency Scores

Statistic	Objective Efficiency model A	Subjective Efficiency model B
Mean	0.698	0.701
Std. Dev.	0.150	0.149
CV	21.457	21.280
MIN	0.370	0.370
Max	1	1
Skewness	0.190	0.189
Kurtosis	2.440	2.445

Source: Authors' calculation

Table 2: Distribution of Subjective & Objective Efficiency Scores

Efficiency scores	Objective Efficiency model A- Frequency	Subjective Efficiency model B -Frequency
Upto 0.5	8	7
0.5-0.7	46	47
0.7-0.9	35	35
0.9-1	11	11
Total	100	100

Source: Authors' calculation

Table 3: NIRF VS Subjective & Objective Efficiency

Categorization according to NIRF scores	NIRF Score & Rank		Objective Efficiency model A		Subjective Efficiency model B	
	Average Score*	Average Rank	Average Efficiency	Average Rank	Average Efficiency	Average Rank
Top 5%	0.68	3	**0.84**	**23.4**	0.85	23
Top 10%	0.65	5.5	**0.80**	**30**	0.80	30.1
Below 5%	0.40	98	0.67	58.8	0.67	59.4
Below 10%	0.40	95.5	0.67	56.6	0.67	57.1

***Average NIRF score has been scaled down by 100.**

Source: Authors' calculation

However, if we compare the efficiency findings with the NIRF ranking, we see wide departures. In order to have a better glimpse of the differences, we adopt a partial approach – looking the reality from the view of some group or positions – the so-called positional objectivity (Piketty 2015; Sen 1980). We find that each in the top 5% universities in terms of NIRF ranking has an average rank of 3 (Table 3). [3] We find that each of the top 5% universities in terms of NIRF ranking has an average rank of 3. Those top 5% universities when put under the efficiency yardstick fetches an average rank of 23.4 in Model A and 23 in Model B. Even same type of relegation is observed when the top 10% NIRF-ranked universities are judged on the basis of DEA. The reverse picture is observed when this partial analysis is carried out at the bottom end of the NIRF ranking table. Below 10% or 5% universities in terms of NIRF yardstick moves up the ladder when examined on the basis of efficiency considerations.

IV. Conclusion

Our study finds that the inclusion or exclusion of the '*subjective*' factor does not influence the efficiency results much. However, a comparative and partial approach reveals some mismatches in our DEA-based rankings and the NIRF rankings. We also see that there is substantial scope of improving the university education outcome even with the existing infrastructure.

Whatsoever, what lies underneath this practice of ranking is the apathetic condition of education in India. Pervasive illiteracy, a low percentage of GDP in education, lack of infrastructure at all levels turn ranking a futile and irrelevant exercise. Surely ranking provides some policy suggestions, but the education scenario of the country as a whole claims a larger policy canvas.

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[1] The NIRF has been making this ranking since 2016. The making is made for various categories such as university, engineering, management, pharmacy, medical, law, architecture and dental education. An overall ranking is also made by combining universities and engineering institutions together. For degree colleges also, a ranking is made. In this paper, we are concerned about the ranking of the universities.

[2] Due to the paucity of space we could not provide the detailed table that we derived using the DEA technique. However, the detailed table is available with the author and can be produced on demand.

[3] Though we have placed the average NIRF scores and average efficiency scores in Table 3 side by side, we cannot compare the NIRF score with the efficiency scores as these scores are derived from different logical frameworks. However, we can compare the efficiency scores in the subjective and objective models.