# TECHNICAL EFFICIENCY IN THE INDIAN TEXTILES INDUSTRY: A NONPARAMETRIC ANALYSIS OF FIRM-LEVEL DATA

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*Abstract*

*Technical Efficiency (TE) of Indian textile firms is obtained using non-parametric Data Envelopment Analysis (DEA). TE scores are then analyzed to get the answers to the following questions:*

- *What are the levels of TE of individual firms when measured against a benchmark constructed from the entire data set i.e., against the global frontier for India as a whole?*
- *Can we infer anything about the size-regional efficiency relationship of firms in the textile industry in India?*
- *Can we say anything about the trend of technology gap i.e., the difference between the regional frontier and the global frontier?*
- *Is there any systematic difference in the regional efficiency of the firms for different location/ownership/organization for the years taken into consideration?*
- *Can we draw any conclusion about the work culture of the states taken into account from the conditional regional efficiency for the different states taken into account?*

*The results obtained can be summarized through the following points:*

- *regional efficiency of Tamil Nadu is the best amongst the six major states considered;*
- *the smallest average size class of firms has the highest group efficiency;*
- *that wholly privately owned (WPO) category of firms has both the largest average size and also has the highest group efficiency amongst ownership categories. Hence, evidence of size-regional efficiency relationship is ambiguous;*
- *we find a clear trend of rising regional efficiency over time. Hence, technology gap across regions seems to be diminishing over time.*

## Introduction

The objective of this paper is to measure *technical efficiency* (TE) of Indian textile firms for selected years using DEA. We also use the concept of metafrontier production function defined by Hayami and Ruttan (1971, pp. 82) to see whether technology indeed varies among different locations, ownership patterns, organizational patterns etc. of textile industry. Battese and Rao (2002) and Battese, Rao and O'Donnell (2004) provide frameworks for comparisons when efficiency is measured using parametric stochastic frontier models. Rao, O'Donnell and Battese (2003) provide both frameworks and an empirical application using FAO agricultural data on 97 countries, comprise of about 99 per cent of global agricultural production and 99 per cent of total population of the world also. They provide framework for both non-parametric DEA and parametric stochastic frontier methods as well. Das, Ray and Nag (2005) use the concept of metafrontier as a national or grand frontier to study branch level labour-use efficiency of a major public sector bank in India. The major questions we ask in this study are as follows:

- What are the levels of TE of individual firms when measured against a benchmark constructed from the entire data set i.e., against the global frontier for India as a whole?
- Can we infer anything about the size-regional efficiency relationship of firms in the textile industry in India?
- Can we say anything about the trend of technology gap i.e., the difference between the regional frontier and the global frontier?
- Is there any systematic difference in the regional efficiency of the firms for different location/ownership/organization for the years taken into consideration?
- Can we draw any conclusion about the work culture of the states taken into account from the conditional regional efficiency for the different states taken into account?

## The DEA Models

The performance of each individual firm in the sample is measured against two different frontiers: one based on firms from all the different groups in the sample and the

other based only on firms from the group to which it belongs. The first can be regarded as the national or *grand* frontier and the other as the *group* frontier. The grand and the group frontiers can be defined as follows. Define the index set *I={1,2,…, N}* where each observed data point is an element of *I*. Now consider a partition $I = \bigcup I_r$ where $I_r$ includes only observations from group *r*. Then, under the standard assumptions of convexity and free disposability of inputs *(x)* and outputs *(y)* the empirically constructed group and grand production possibility sets are

$$S^r = \{(x, y) : x \geq \sum_{j \in I_r} \lambda_j x^j ; y \leq \sum_{j \in I_r} \lambda_j y^j ; \sum_{j \in I_r} \lambda_j = 1; \lambda_j \geq 0; (j \in I_r)\} \text{(For group } r\text{)}$$

and

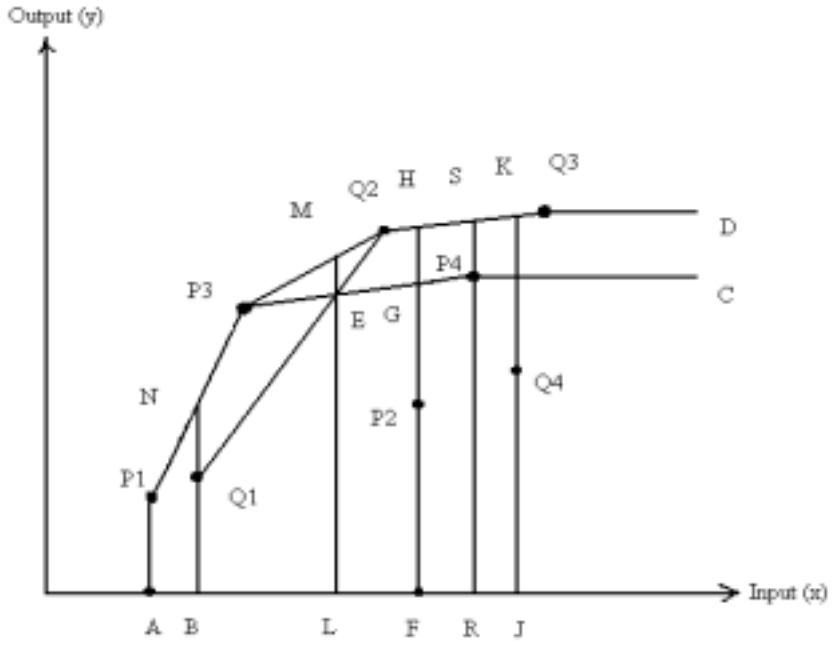
$$S^G = \{(x, y) : x \geq \sum_{j \in \bigcup I_r} \lambda_j x^j ; y \leq \sum_{j \in \bigcup I_r} \lambda_j y^j ; \sum_{j \in \bigcup I_r} \lambda_j = 1; \lambda_j \geq 0; (j \in \bigcup I_r)\},$$

respectively. It may be noted that while each $S^r$ is a subset of $S^G$, the latter is bigger than the union of the individual group production possibility sets. This is illustrated by a simple diagram in Figure 1 for a 1-input, 1-output 2-group example.

Let the points $P_1$ through $P_4$ show the input-output bundles of four firms from group *P*. Similarly, $Q_1$ through $Q_4$ are the input-output bundles of firms from group *Q*. The group frontiers are shown by the broken lines $AP_1P_3P_4C$ for group *P* and by $BQ_1Q_2Q_3D$ for group *Q*. By contrast, the grand frontier is the outer envelop of the two frontiers shown by the broken line $AP_1P_3Q_2Q_3D$. Note that points in the area $P_3EQ_2$ lie above both group frontiers, but (by virtue of convexity) are below the grand frontier. While judged against their own group frontier the technical efficiency of each the points $Q_1$, $Q_2$, and $Q_3$ equals unity while the corresponding efficiency of $Q_4$ is $\frac{JQ_4}{JK}$. When judged against the grand frontier, $Q_2$ and $Q_3$ remain efficient. On the other hand the efficiency of $Q_1$ falls from unity to $\frac{BQ_1}{BN}$ while the efficiency of $Q_4$ does not change. Thus the *group efficiency* of the group *Q* measured at the points $Q_2$, $Q_3$, and $Q_4$ equals unity (even though point $Q_4$ is inefficient) while at the point $Q_1$, the group efficiency is $\frac{BQ_1}{BN}$. The geometric mean of the group efficiency measures at these different points may be used as an overall index of the *group efficiency* of *Q*. From group *P* the points $P_1$ and $P_2$ lie both on the group and the grand frontier. The point $P_4$ is on the group frontier but has

technical efficiency $\frac{RP_4}{RS}$. In the case of point $P_2$ technical efficiency is $\frac{FP_2}{FG}$ relative to the group frontier and $\frac{FP_2}{FH}$ when measured against the grand frontier. Thus, at this point a measure of group efficiency is $\frac{FG}{FH}$. It is interesting to note that point *E* lies on both of the group frontiers but not on the grand frontier. Thus, at this point both groups would have the same level of group (in) efficiency.

**Figure 1: Group and Grand Frontiers**




We first consider the DEA model for measuring efficiency relative to the group frontier. For the firm *j* in group *r* producing output $y^j_r$ from the input $x^j_r$, the group efficiency is $TE^j_r = \frac{1}{\varphi^j_r}$ while the grand efficiency is $TE^j_G = \frac{1}{\varphi^j_G}$ where

$$\varphi^j_r = \max \varphi : (x^j_r, \varphi y^j_r) \in S^r \text{ and } \varphi^j_G = \max \varphi : (x^j_r, \varphi y^j_r) \in S^G.$$

A point-wise measure of the technical efficiency of group *r* is $\beta^j_r = \frac{TE^j_G}{TE^j_r}$. An overall measure of the efficiency of group *r* is

$$TE(r) = \left( \prod_{j \in r} \beta_r^j \right)^{\frac{1}{n_r}},$$ where $n_r$ is the number of firms in group $r$.

**Justification of Such Analysis in the Context of Indian Industry**

India is a vast country with a number of states and union territories with their distinctive sociological, economic, political and infrastructural features. The physical strength of an average Punjabi is more than that of many other states of India. Work culture of the people of the states like Gujarat, Maharashtra etc. is far better than that of West Bengal (Das et al, 2005). Easy access to natural resources and other infrastructural facilities helpful in achieving lower cost per unit of output is not evenly distributed all over the country. Stability of political power and democratic nature of the overall political environment is also different for different states. Different political parties with the varying political and economic agenda form governments in different states. Militancy of labor unions varies considerably across different parts of the country. All these factors are important determinants of the performance of a firm as reflected by its level of efficiency located in any particular region. The production function for different regions need not be different if all of the above factors could be take into accounts. But most of them are qualitative in nature and unobservable as well, and as a result we couldn't take into them account as factors of production. Hence, it is not wrong to assume that the production technology (defined in terms of the observed inputs and outputs) is itself different for different regions like states for differences in the quality of human capital, work culture and overall working environment, infrastructural facilities etc. Some of them do vary for different ownership as well as organizational pattern. We investigate how far variation in the above three factors namely state, ownership pattern and organizational pattern affects the levels of technical efficiency of individual firms.

**Description of Data, Inputs and Output**

We use establishment-level data from the Annual Survey of Industries for the years 1993-4, 1998-9, 1999-2000 and 2001-02 for our study. The data covers more than 75 per cent of the entire textile industry, which covers units related to the production of cotton,

woolen, silk, terry cotton, and other natural fibers like jute, coir, mesta etc. It is only for "Spinning, weaving and finishing of textiles" (NIC Code 171 as per NIC'98).

To perform metafrontier analysis for studying the effects of different location we have considered only six major textile-producing states namely Gujarat, Maharashtra, Punjab, Rajasthan, Tamil Nadu and West Bengal. Similarly, we consider all of the six ownership patterns namely ***wholly central government (WCG), wholly state and/or local government (WSLG), central government and state and/or local government jointly (JCSLG), joint sector public (JSPU), joint sector private (JSPR)*** and ***wholly private ownership (WPO)*** as given by the CSO. But there is a high concentration in the distribution of firms as per their ownership pattern. Almost ninety percent of the firms are in ***wholly private ownership*** category for all of the four sample years taken into consideration. As for the organizational pattern we have taken six major viz.***, individual proprietorship (IP), partnership (Part), public limited company (PULC), private limited company (PRLC), co-operative society (COOPS)*** and the remaining are grouped in ***others*** category. Summary statistics for these location, ownership pattern and organizational pattern are given in Table 1a, Table 1b and Table 1c respectively.

We conceptualize a *one* output-*three* input technology. The variables considered are:

***Output:*** the total ex-factory value of products and by-products produced by the firm during the year in question; ***Intermediate Inputs*****:** the nominal value of inputs (both indigenous and imported ones, including power, fuels etc.) used by the firm during the year; ***Capital*** **:** the net value of fixed assets of the firm at the beginning of a year, and ***Labor:*** the total number of mandays worked during the year.

**Empirical Findings**

Our empirical analysis shows that

- regional efficiency of Tamil Nadu is the best amongst the six major states considered;
- the smallest average size class of firms has the highest group efficiency;
- that wholly privately owned (WPO) category of firms has both the largest average size and also has the highest group efficiency amongst ownership categories. Hence, evidence of size-regional efficiency relationship is ambiguous;

- we find a clear trend of rising regional efficiency over time. Hence, technology gap across regions seems to be diminishing over time.

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**Table 1a: Summary Statistics for Different States**

| State | Variable | Average Value (in '000 Rs. Except for Labour) | | | |
|---|---|---|---|---|---|
| | | 1993-94 | 1998-99 | 1999-00 | 2001-02 |
| Gujarat | Output | 136140 | 256887 | 245507 | 278734 |
| | II[$] | 88969 | 203094 | 197521 | 214245 |
| | Capital | 46841 | 183591 | 198346 | 247337 |
| | Labour[*] | 116 | 107 | 117 | 87 |
| | % of Firms | 13.82 | 10.42 | 13 | 12.36 |
| Maharashtra | Output | 215859 | 432851 | 398861 | 361953 |
| | II | 106419 | 320960 | 297331 | 270457 |
| | Capital | 62649 | 324222 | 303898 | 257478 |
| | Labour | 214 | 265 | 227 | 169 |
| | % of Firms | 10.33 | 9.71 | 11.45 | 9.94 |
| Punjab | Output | 113086 | 305175 | 401346 | 319813 |
| | II | 78838 | 230404 | 305316 | 248829 |
| | Capital | 63587 | 212304 | 232001 | 170092 |
| | Labour | 92 | 160 | 192 | 138 |
| | % of Firms | 9.16 | 5.85 | 5 | 4.66 |
| Rajasthan | Output | 131793 | 178613 | 247943 | 225184 |
| | II | 89917 | 136960 | 187670 | 175245 |
| | Capital | 36687 | 100673 | 136621 | 126340 |
| | Labour | 78 | 112 | 140 | 111 |
| | % of Firms | 9.91 | 10.35 | 7.78 | 7.53 |
| Tamil Nadu | Output | 150371 | 199892 | 181905 | 169262 |
| | II | 73189 | 145871 | 141786 | 129509 |
| | Capital | 37279 | 78539 | 77258 | 71342 |
| | Labour | 109 | 110 | 103 | 87 |
| | % of Firms | 23.14 | 26 | 27 | 28.6 |
| West Bengal | Output | 281631 | 444773 | 511845 | 487229 |
| | II | 121470 | 275923 | 326361 | 318621 |
| | Capital | 67534 | 159313 | 183162 | 169206 |
| | Labour | 690 | 754 | 799 | 644 |
| | % of Firms | 3.23 | 5.21 | 4.77 | 4.77 |
| All India | Output | 146123 | 260286 | 263760 | 251721 |
| | II | 86636 | 189299 | 198029 | 191281 |
| | Capital | 43841 | 153579 | 157655 | 161008 |
| | Labour | 138 | 184 | 169 | 130 |
| | % of Firms | 100 | 100 | 100 | 100 |
| *$ II stands for Intermediate Input, * Labour is in '000 of mandays* | | | | | |

**Table 1b: Summary Statistics for Different Ownership Pattern**

| Ownership | Variable | Average Value (in '000 Rs. Except for Labour) | | | |
|---|---|---|---|---|---|
| | | 1993-94 | 1998-99 | 1999-00 | 2001-02 |
| WCG | Output | 135904 | 105334 | 90356 | 81427 |
| | II[$] | 65950 | 84086 | 77196 | 70262 |
| | Capital | 28144 | 51671 | 39544 | 49733 |
| | Labour[*] | 345 | 345 | 330 | 266 |
| | % of Firms | 3.11 | 3.78 | 3.6 | 2.70 |
| WSLG | Output | 146666 | 148323 | 136313 | 117447 |
| | II | 98663 | 110055 | 107500 | 95541 |
| | Capital | 25050 | 42188 | 38395 | 35997 |
| | Labour | 318 | 230 | 218 | 182 |
| | % of Firms | 3.23 | 4.57 | 6.77 | 3.28 |
| JCSLG | Output | 112585 | 63658 | 88876 | 8441 |
| | II | 76205 | 52021 | 75714 | 11992 |
| | Capital | 23512 | 48332 | 24768 | 6857 |
| | Labour | 165 | 82 | 91 | 139 |
| | % of Firms | 0.97 | 0.87 | 0.44 | 0.35 |
| JSPU | Output | 138279 | 217843 | 193864 | 114821 |
| | II | 91491 | 176479 | 158093 | 101409 |
| | Capital | 30381 | 96394 | 90515 | 73560 |
| | Labour | 268 | 201 | 183 | 126 |
| | % of Firms | 3.07 | 3.93 | 3.82 | 3.28 |
| JSPR | Output | 153009 | 398146 | 626774 | 408730 |
| | II | 96570 | 271766 | 453485 | 262702 |
| | Capital | 49925 | 228651 | 344941 | 121036 |
| | Labour | 214 | 235 | 292 | 120 |
| | % of Firms | 1.43 | 3.07 | 2.27 | 1.32 |
| WPO | Output | 146992 | 272334 | 272563 | 265588 |
| | II | 86708 | 197352 | 203802 | 201490 |
| | Capital | 45691 | 165257 | 168019 | 173486 |
| | Labour | 118 | 172 | 156 | 125 |
| | % of Firms | 88.2 | 83.8 | 85.11 | 89.13 |
| *$ II stands for Intermediate Input, * Labour is in '000 of mandays* | | | | | |

**Table 1c: Summary Statistics for Different Organizational Pattern**

| Organization | Variable | Average Value (in '000 Rs. Except for Labour) | | | |
|---|---|---|---|---|---|
| | | 1993-94 | 1998-99 | 1999-00 | 2001-02 |
| IP | Output | 25405 | 10315 | 11353 | 11546 |
| | II[$] | 21017 | 8110 | 9263 | 9696 |
| | Capital | 1195 | 1707 | 8264 | 1782 |
| | Labour[*] | 18 | 6 | 12 | 7 |
| | % of Firms | 7.64 | 7.14 | 6.97 | 5.11 |
| Part | Output | 61323 | 58615 | 37616 | 35307 |
| | II | 46474 | 39628 | 28238 | 28370 |
| | Capital | 4722 | 6219 | 12655 | 6977 |
| | Labour | 30 | 16 | 24 | 16 |
| | % of Firms | 26.04 | 17.13 | 15.85 | 13.45 |
| PULC | Output | 328110 | 495817 | 512421 | 472519 |
| | II | 172726 | 358468 | 381457 | 350047 |
| | Capital | 120482 | 308646 | 321285 | 327183 |
| | Labour | 299 | 291 | 285 | 232 |
| | % of Firms | 28.77 | 41.4 | 43.14 | 39.66 |
| PRLC | Output | 79599 | 138356 | 107143 | 164817 |
| | II | 58174 | 98903 | 82306 | 134439 |
| | Capital | 20600 | 91506 | 51607 | 84653 |
| | Labour | 63 | 157 | 72 | 65 |
| | % of Firms | 22.76 | 18.63 | 21.13 | 29.71 |
| COOPS | Output | - | 145391 | 110113 | 102584 |
| | II | - | 124392 | 94983 | 85096 |
| | Capital | - | 54032 | 47288 | 48926 |
| | Labour | - | 146 | 129 | 93 |
| | % of Firms | - | 6.14 | 5.28 | 5.11 |
| Others | Output | 106189 | 99800 | 98197 | 68820 |
| | II | 67592 | 78083 | 77837 | 55501 |
| | Capital | 21434 | 44448 | 40219 | 37070 |
| | Labour | 194 | 227 | 260 | 173 |
| | % of Firms | 14.78 | 9.56 | 7.63 | 6.95 |
| *$ II stands for Intermediate Input, * Labour is in '000 of mandays* | | | | | |

Table 2a: Average Technical Efficiency for Different States

| State | Year | No. of Firms | Based on Own Frontier | Based on Global Frontier | Regional Efficiency |
|---|---|---|---|---|---|
| Gujarat | 1990-91 | | | | |
| | 1993-94 | 329 | 0.24 | 0.02 | 0.10 |
| | 1998-99 | 146 | 0.52 | 0.15 | 0.29 |
| | 1999-2000 | 177 | 0.64 | 0.31 | 0.48 |
| | 2001-02 | 214 | 0.60 | 0.44 | 0.74 |
| Maharashtra | | | | | |
| | 1993-94 | 246 | 0.15 | 0.026 | 0.17 |
| | 1998-99 | 136 | 0.30 | 0.14 | 0.48 |
| | 1999-2000 | 156 | 0.51 | 0.30 | 0.59 |
| | 2001-02 | 173 | 0.63 | 0.46 | 0.73 |
| Punjab | | | | | |
| | 1993-94 | 218 | 0.21 | 0.04 | 0.19 |
| | 1998-99 | 82 | 0.80 | 0.14 | 0.18 |
| | 1999-2000 | 68 | 0.60 | 0.38 | 0.64 |
| | 2001-02 | 81 | 0.80 | 0.49 | 0.61 |
| Rajasthan | | | | | |
| | 1993-94 | 236 | 0.11 | 0.04 | 0.32 |
| | 1998-99 | 145 | 0.58 | 0.15 | 0.25 |
| | 1999-2000 | 106 | 0.66 | 0.33 | 0.50 |
| | 2001-02 | 131 | 0.60 | 0.48 | 0.80 |
| Tamil Nadu | | | | | |
| | 1993-94 | 551 | 0.019 | 0.016 | 0.88 |
| | 1998-99 | 364 | 0.18 | 0.13 | 0.76 |
| | 1999-2000 | 368 | 0.46 | 0.33 | 0.71 |
| | 2001-02 | 498 | 0.57 | 0.47 | 0.82 |
| West Bengal | | | | | |
| | 1993-94 | 77 | 0.44 | 0.026 | 0.06 |
| | 1998-99 | 73 | 0.69 | 0.20 | 0.29 |
| | 1999-2000 | 65 | 0.69 | 0.49 | 0.71 |
| | 2001-02 | 83 | 0.84 | 0.60 | 0.72 |

Table 2b: Average Technical Efficiency for Different Ownership Pattern

| State | Year | No. of Firms | Based on Own Frontier | Based on Global Frontier | Regional Efficiency |
|---|---|---|---|---|---|
| WCG | 1993-94 | 74 | 0.18 | 0.01 | 0.08 |
| | 1998-99 | 53 | 0.61 | 0.08 | 0.13 |
| | 1999-2000 | 49 | 0.59 | 0.21 | 0.35 |
| | 2001-02 | 47 | 0.70 | 0.37 | 0.53 |
| WSLG | 1993-94 | 77 | 0.63 | 0.02 | 0.04 |
| | 1998-99 | 64 | 0.40 | 0.11 | 0.26 |
| | 1999-2000 | 65 | 0.73 | 0.29 | 0.39 |
| | 2001-02 | 57 | 0.75 | 0.44 | 0.59 |
| JCSLG | 1993-94 | 23 | 0.77 | 0.017 | 0.022 |
| | 1998-99 | 12 | 0.85 | 0.08 | 0.09 |
| | 1999-2000 | 6 | 0.97 | 0.28 | 0.29 |
| | 2001-02 | 6 | 0.67 | 0.19 | 0.28 |
| JSPU | 1993-94 | 73 | 0.58 | 0.02 | 0.03 |
| | 1998-99 | 55 | 0.67 | 0.13 | 0.19 |
| | 1999-2000 | 52 | 0.79 | 0.31 | 0.40 |
| | 2001-02 | 57 | 0.76 | 0.39 | 0.51 |
| JSPR | 1993-94 | 34 | 0.71 | 0.017 | 0.023 |
| | 1998-99 | 43 | 0.74 | 0.14 | 0.19 |
| | 1999-2000 | 31 | 0.79 | 0.3 | 0.41 |
| | 2001-02 | 23 | 0.70 | 0.42 | 0.59 |
| WPO | 1993-94 | 2100 | 0.03 | 0.03 | 1.0 |
| | 1998-99 | 1174 | 0.16 | 0.16 | 0.996 |
| | 1999-2000 | 1160 | 0.336 | 0.336 | 0.9994 |
| | 2001-02 | 1548 | 0.49 | 0.49 | 0.998 |

Table 2c: Average Technical Efficiency for Different Organizational Pattern

| State | Year | No. of Firms | Based on Own Frontier | Based on Global Frontier | Regional Efficiency |
|---|---|---|---|---|---|
| IP | 1993-94 | 182 | 0.22 | 0.05 | 0.21 |
| | 1998-99 | 100 | 0.52 | 0.15 | 0.28 |
| | 1999-2000 | 95 | 0.76 | 0.22 | 0.30 |
| | 2001-02 | 89 | 0.76 | 0.47 | 0.63 |
| Part | 1993-94 | 620 | 0.10 | 0.04 | 0.44 |
| | 1998-99 | 240 | 0.25 | 0.13 | 0.53 |
| | 1999-2000 | 216 | 0.31 | 0.27 | 0.86 |
| | 2001-02 | 234 | 0.49 | 0.47 | 0.96 |
| PULC | 1993-94 | 685 | 0.023 | 0.021 | 0.92 |
| | 1998-99 | 580 | 0.25 | 0.18 | 0.72 |
| | 1999-2000 | 588 | 0.46 | 0.42 | 0.91 |
| | 2001-02 | 690 | 0.57 | 0.52 | 0.90 |
| PRLC | 1993-94 | 542 | 0.19 | 0.02 | 0.09 |
| | 1998-99 | 261 | 0.16 | 0.13 | 0.82 |
| | 1999-2000 | 288 | 0.46 | 0.31 | 0.67 |
| | 2001-02 | 517 | 0.57 | 0.45 | 0.79 |
| COOPS | 1993-94 | - | - | - | - |
| | 1998-99 | 86 | 0.65 | 0.13 | 0.20 |
| | 1999-2000 | 72 | 0.71 | 0.27 | 0.38 |
| | 2001-02 | 89 | 0.74 | 0.42 | 0.57 |
| Others | 1993-94 | 352 | 0.10 | 0.02 | 0.19 |
| | 1998-99 | 134 | 0.53 | 0.09 | 0.18 |
| | 1999-2000 | 104 | 0.61 | 0.23 | 0.37 |
| | 2001-02 | 121 | 0.58 | 0.37 | 0.64 |

Table 3: Regional Efficiency (RE) of Different States for Wholly Privately Owned Firms as per their Organization

| State | Organization | 1993-94 | | 1998-99 | | 1999-2000 | | 2001-02 | |
|---|---|---|---|---|---|---|---|---|---|
| | | No. of Firms | RE | No. of Firms | RE | No. of Firms | RE | No. of Firms | RE |
| Gujarat | IP | 25 | 0.22 | 6 | 0.12 | 15 | 0.35 | 12 | 0.62 |
| | Part | 90 | 0.15 | 31 | 0.32 | 24 | 0.35 | 42 | 0.63 |
| | PULC | 83 | 0.05 | 58 | 0.35 | 68 | 0.60 | 82 | 0.82 |
| | PRLC | 98 | 0.09 | 43 | 0.26 | 62 | 0.46 | 75 | 0.74 |
| | COOPS | - | - | 0 | - | 1 | 0.30 | 0 | - |
| | Others | 18 | 0.15 | 2 | 0.21 | 2 | 0.31 | 1 | 0.60 |
| Maharashtra | IP | 10 | 0.26 | 3 | 0.51 | 3 | 0.46 | 3 | 0.67 |
| | Part | 34 | 0.39 | 7 | 0.57 | 13 | 0.41 | 9 | 0.67 |
| | PULC | 67 | 0.12 | 50 | 0.48 | 59 | 0.70 | 64 | 0.78 |
| | PRLC | 56 | 0.16 | 21 | 0.56 | 19 | 0.61 | 39 | 0.71 |
| | COOPS | - | - | 6 | 0.45 | 12 | 0.56 | 5 | 0.81 |
| | Others | 18 | 0.18 | 1 | 0.93 | 2 | 0.72 | 0 | - |
| Punjab | IP | 16 | 0.45 | 13 | 0.13 | 2 | 0.27 | 8 | 0.55 |
| | Part | 120 | 0.25 | 18 | 0.13 | 18 | 0.55 | 17 | 0.59 |
| | PULC | 22 | 0.06 | 23 | 0.26 | 23 | 0.87 | 29 | 0.65 |
| | PRLC | 39 | 0.12 | 14 | 0.19 | 12 | 0.63 | 20 | 0.62 |
| | COOPS | - | - | 0 | - | 0 | - | 0 | - |
| | Others | 7 | 0.14 | 0 | - | 3 | 0.27 | 0 | - |
| Rajasthan | IP | 50 | 0.55 | 30 | 0.25 | 21 | 0.37 | 18 | 0.79 |
| | Part | 97 | 0.50 | 44 | 0.26 | 25 | 0.50 | 19 | 0.88 |
| | PULC | 38 | 0.08 | 40 | 0.28 | 28 | 0.65 | 38 | 0.73 |
| | PRLC | 31 | 0.28 | 18 | 0.20 | 24 | 0.47 | 44 | 0.83 |
| | COOPS | - | - | 1 | 0.24 | 0 | - | 1 | 0.87 |
| | Others | 7 | 0.36 | 2 | 0.20 | 0 | - | 3 | 0.91 |
| Tamil Nadu | IP | 34 | 0.67 | 25 | 0.72 | 27 | 0.91 | 22 | 0.87 |
| | Part | 100 | 0.77 | 57 | 0.64 | 57 | 0.86 | 68 | 0.82 |
| | PULC | 192 | 0.96 | 162 | 0.77 | 167 | 0.63 | 174 | 0.82 |
| | PRLC | 162 | 0.92 | 77 | 0.79 | 82 | 0.74 | 194 | 0.81 |
| | COOPS | - | - | 1 | 0.89 | 0 | - | 3 | 0.91 |
| | Others | 33 | 0.78 | 11 | 0.75 | 8 | 0.81 | 13 | 0.82 |
| West Bengal | IP | 1 | 0.09 | 0 | - | 0 | - | 0 | - |
| | Part | 4 | 0.20 | 3 | 0.13 | 2 | 0.62 | 1 | 0.51 |
| | PULC | 46 | 0.06 | 48 | 0.34 | 43 | 0.74 | 56 | 0.77 |
| | PRLC | 8 | 0.05 | 9 | 0.30 | 5 | 0.61 | 10 | 0.68 |
| | COOPS | - | - | 0 | - | 0 | - | 0 | - |
| | Others | 1 | 0.02 | 0 | - | 2 | 0.55 | 1 | 1.0 |