

Law Enforcement Efficiency Analysis in India

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Abstract

After the independence when the Constitution was formed in India, the provision of maintenance of police was made in the purview of state government. It was expected that the Police protection should be easily accessible to all the people in the society. Crores of rupees are spent each year in the country by the all tiers of Governments to arrangement of protection services. In the meantime, many Police forces are struggling with tight budgets while trying to provide adequate Police services. Effective distribution of these finances can save massive sums of capital. The entire equivalent, the effectiveness and efficiency of these expenditures are notoriously difficult to judge. Hence this study aims to examine the relative efficiency of state police units in India. The study uses mainly secondary sources of data and utilized data envelopment analysis technique to examine the relative efficiency of police units in the country. The study finds that four units are operating on efficiency frontier, whereas, other 26 units are operating relatively below the efficiency frontier. Kerala, Delhi, Bihar and Uttar Pradesh are efficient units and remaining units are comparatively less efficient. This infers that the necessity of invest in human capital by training the staff appropriately and arming the Police with advanced equipment and technology, consequently that police units can function at the finest level.

Key Words: Police Efficiency, Data Envelopment Analysis, Public Expenditure

Introduction

Right from the origin of economics the functions of the state are well defined. The law and order from ancient to till date is basic function of public finance which is a segment of public economics. From theoretical perspective to empirical analysis, from Adam smith to latest modern public economist efficiency of public sector is pride issue of analysis. Crores of rupees are spent each year in India at all tiers of Government to arrangement of protection services. In the meantime, many Police forces are struggling with tight budgets while trying to provide adequate Police services. Effective distribution of these finances can save massive sums of capital. The entire equivalent, the effectiveness and efficiency of these expenditures are notoriously difficult to judge. It is vital for the Police Department to secure the economic,

effective and efficient provision of police inspection and repairs. However, due to the difficulty of Police operations, conventional performance measurement methods have not been really efficient in recognizing and allocating best practices all over the Police force. Keeping this importance in mind, authors taken this topic for research which itself at national level less attended.

Review of Literature

Literature survey plays a significant role in the research study. Without literature, it is very difficult to know the outcome of the past research. Hence it is necessary to conduct a literature survey to gather the major inferences in the past study and also know the major issues have been left out in the previous studies.

Shinn Sun (2000) has focused to evaluate the relative efficiency of Police precincts if Taipei city in Taiwan. Hence, to assess the relative efficiency the author used Data envelopment analysis. Their result shows how DEA might be used to assess these Police areas from regularly accessible Police statistical data for the three years that is from 1994-1996. To hone their efficiency gauges, the authors used window analysis, slack variable examination, and output-oriented Data envelopment models with both CRS and VRS. The matter of the existence of non-optional input factors are expressly treated in the models utilized. Potential to progress in technical efficiency of Police regions is inspected by straightening out the specific output/input indicators. The study demonstrates that divergences in working environments, such as inhabitant populace and area factors, don't have a significant impact on the efficiency of Police regions.

Drake & Simper (2000) measured the productivity of the England and Welsh Police forces using the Data envelopment analysis and multiple discriminant analysis. In this paper, productivity inferences are possible by utilizing DEA technique and the results exhibits that the surrey Police department emerged to be 38% of less efficient compared to its reference unit and Cleveland, Dorset and Leicestershire Police departments are consistently efficient.

Carlos Pestana Barros (2006) in his research paper examines the efficiency of the Lisbon Police force area. Researchers used two stages DEA. In the primary stage, they were gauging the Data Envelopment Analysis efficiency scores and match up to the areas with one another. Authors rank the areas as indicated by their efficiency for the period of 2000-2002. In the last stage, they have employed the Tobit model in which the rank scores are relapsed in socio-economical issues, recognize the social causes which change over the city and that influence prevention approach. The economic ramifications emerging from the subject field are considered.

Verma & Garvineni (2006) estimated the Police effectiveness in India. The authors used the data envelopment analysis for the same purpose. This study tenders the opinion for making out best performance practices in the Police department. This study did not consider the parts

of the heterogeneous environment of state Police existing in India. Since certain states have a bigger area and populace when contrasted with different states. This research process estimates the execution and effectiveness of state Police forces in India, and the outcome proposes manners by which few State Police forces can pick up their general efficiency.

From review of literature researcher felt law enforcement efficiency is the significant aspect of public Economics from classical to till date modern economist. Here researchers made pertinent literature review on law and order linking with development and efficiency.

Statement of the Research Problem

Crime is a global issue and has to be high on the agenda of all the countries whether developed or developing. In the framework of India, the impact of development and changes in the law and order sector is quite divergent and unsatisfactory. Yet the fact remains that crime increases, more people still lives with fear. Moreover, inadequate allocation of Police expenditure and its inequitable spread across different states have resulted in inequitable crime status. Keeping these facts in mind, a need was felt to study Law Enforcement Efficiency Analysis in India

Need of the Study

The Constitution made the provision of maintenance of police in the purview of state government. It was expected that the Police protection should be easily accessible to all the people in the society. This research will be helpful in this direction. In India, over a period of time, crimes are increases day by day, thereby creating fear among the people. Hence, governments are spending crores of rupees on law and order system to control the crime. Only few studies have been taken up so far. The observations and suggestions of this study may provide valuable inputs to officials.

Objective of the study

This study aims to examine the relative efficiency of state police units in India and also focus on the possible detected issues of the inefficient units in the study area.

Methodology and Data Sources

The study was mainly depending upon secondary data. The field chosen for the research was mainly state police units in India. The data for the study were collected from the National Crime Record Bureau, State Budget Documents etc., The collected data were carefully analysed, tabulated and formulated. Finally, the collected data were mined further and consolidated to know its suitability for the purposes of analysis. This study is pertaining for the period of 2015. The secondary data collected have been put into a database, widely used EXCEL, DEAP 2.1. Data envelopment analysis has been used to compute the relative efficiency of Police units in India.

Table-1 List of Inputs and Outputs

INPUTS	OUTPUTS
<p>Total Police Expenditure (TPE) Total Police Expenditure in Crores in India made during 2015. Police expenditures are one the major input to improve the Police efficiency in the provinces. Hence this has been regarded as one of the primary inputs to obtain the Police efficiency.</p> <p>Transport Facilities (TF) Transport Facilities, transport facilities play an important role in to detect the criminals and it will helpful to control the crime rates in the country. Therefore, here considered one of the main inputs.</p> <p>Number of Police Officers (NPO) Number of Police Officers in particular State. Crimes cannot be controlled or detected without the appropriate number of Police officers. As a result, it is considered as one of the important inputs.</p> <p>Number of Cases for Investigation (NCI) Number of Cases for Investigation is reported crimes by Police stations in the States. It is also one of the main factors for determining the Police efficiency hence this factor has been considered as input in the study.</p>	<p>Number of Disposal Cases (NDC) Number of Disposal cases, this is the output of Police units after the case filled. NDC indicated here number of cases disposed against number of cases filed</p> <p>Number of Cases Charge sheeted (NCC) Shows that Number of Cases Charge sheeted, this is the important output to measure the Police efficiency. NCC indicates here number of charge sheeted against number of cases filed.</p>

The Empirical Results

In this section, first the efficiency of 30 Indian state police forces is measured secondly; the statewide efficiency scores are analyzed and compared. Following tables illustrate comprehensive results of efficiency analysis using the DEAP 2.1 software.

The Technical Efficiency Result

Using the 4 inputs and 2 outputs in 30 states of India during 2015 (including Delhi UT), table 5.2 depicts that, out of 30 States, 4 are operating on efficiency frontier, whereas, other 26 States are operating below the efficiency frontier. Kerala, Delhi, Bihar and Uttar Pradesh are efficient States. The technical efficiency estimates reveal the least performing states which are Manipur, Assam, Haryana, Meghalaya Arunachal Pradesh, Jharkhand and Nagaland as shown in the table-2.

Table-2 Technical Efficient Scores of the States

Andra Pradesh	0.942	Manipur	0.280
Arunachala Pradesh	0.716	Meghalaya	0.687
Assam	0.519	Mizoram	0.940
Bihar	1.000	Nagaland	0.791
Chhattisgarh	0.972	Odisha	0.954
Goa	0.776	Punjab	0.923
Gujarat	0.946	Rajasthan	0.868
Haryana	0.657	Sikkim	0.833
Himachala Pradesh	0.939	Tamil Nadu	0.931
Jammu & Kashmir	0.888	Telangana	0.859
Jharkhand	0.779	Tripura	0.922
Karnataka	0.913	Uttara Pradesh	1.000
Kerala	1.000	Uttarkhand	0.867
Madhya Pradesh	0.981	West Bengal	0.888
Maharashtra	0.869	Delhi ut	1.000

Source: Author's Calculations by using DEAP software.

The Output Targets and Slacks

In consideration of the state-wise data of Indian Police, Table-3 shows the target levels for all the two outputs. Kerala, Uttar Pradesh, Delhi and Bihar consume higher inputs.

Table-3 Summary of Output and Targets

States	NDC		NCC	
	Target	Slacks	Target	Slacks
Andra Pradesh	159840.766	37421.766	169830.000	0.000
Arunachala Pradesh	4575.000	0.000	4627.000	0.000
Assam	108674.403	1212.403	115466.000	0.000
Bihar	171242.000	0.000	240152.000	0.000
Chhattisgarh	299947.000	0.000	286002.000	0.000
Goa	6693.679	598.679	7112.000	0.000
Gujarat	425811.000	0.000	443451.000	0.000
Haryana	124913.000	0.000	100835.000	0.000
Himachala Pradesh	17901.262	809.262	19020.000	0.000
Jammu & Kashmir	31751.682	4932.682	33736.000	0.000
Jharkhand	60801.233	10291.233	64601.000	0.000
Karnataka	198829.188	47268.188	211255.000	0.000
Kerala	650325.000	0.000	690967.000	0.000
Madhya Pradesh	356043.000	0.000	367258.000	0.000
Maharashtra	506300.780	118442.78	537942.000	0.000
Manipur	7136.034	2778.034	7582.000	0.000
Meghalaya	8477.217	4905.217	9007.000	0.000

Mizoram	2882.837	216.837	3063.000	0.000
Nagaland	1920.950	102.95	2041.000	0.000
Odisha	128326.262	24834.262	136346.000	0.000
Punjab	93991.039	36867.039	99865.000	0.000
Rajasthan	263952.000	0.000	240528.000	0.000
Sikkim	911.063	163.063	968.000	0.000
Tamilnadu	501034.873	39162.873	522347.000	0.000
Telangana	134863.705	10261.705	143292.000	0.000
Tripura	5223.554	686.554	5550.000	0.000
Uttara Pradesh	2781544.000	0.000	238245.000	0.000
Uttarkhand	96765.000	0.000	83838.000	0.000
West Bengal	246410.593	30587.593	261810.000	0.000
Delhi ut	177014.000	0.000	4474.000	0.000
Mean	252470.000	12384.771	168373	0.000

Source: Author's Calculations

Therefore, the result in higher output targets as seen in Table-3. It reveals the efficiency gap (slack) which should be filled by the DMUs. The lexical meaning of 'slack' is lagging behind. Here, it shows the laziness of the DMU in a quantitative way. Mathematically speaking, slacks are such non-negative quantities which are needed to convert inequality to equality. In Table-3 output slacks are calculated through the DEA. These output slacks are needed for the inefficient state to operate on efficiency frontier.

The Detected Issues in Inputs

Tables-4 shows more comprehensive and individual results for all DMUs. It includes the issues identified in the inputs. The DEA gives 'slack movement'. Its negativity means the excess of input. Here TPE, TF and NPO are negative in some cases which show an excess of those inputs. In particular, 'Over expenditure' 'Over Transport facilities' and 'Over staffing' are the three issues detected through the negative slack movement.

Kerala, Delhi, Bihar and Uttar Pradesh are not the issues of Over Expenditure, Over Transport facilities and Over Staffing. These states show that good performance with respect of proper utilization of resources. Manipur, Assam Haryana, Meghalaya, Arunachala Pradesh, Jharkhand and Nagaland the issues of Over Expenditure, Over Transport facilities and Over Staffing and their performance is very poor compared to the reference performance state.

Table -4 Detected Issues in Inputs

States	Issues in Inputs	States	Issues in Inputs
Andra Pradesh	Over staff,	Manipur	Over staff
Arunachala Pradesh	Over staff and Expenditure	Meghalaya	Over staff

Assam	Over staff and Expenditure	Mizoram	Over staff and transport facilities
Bihar	---	Nagaland	Over staff and Expenditure
Chhattisgarh	Over staff	Odisha	Over staff and transport facilities
Goa	Over staff, transport facilities and Expenditure	Punjab	Over staff, transport facilities and Expenditure
Gujarat	Over staff and transport facilities	Rajasthan	Over staff
Haryana	Over staff and transport facilities	Sikkim	Over staff
Himachala Pradesh	Over staff and Expenditure	Tamilnadu	Over staff and transport facilities
Jammu & Kashmir	Over staff and Expenditure	Telangana	Over staff and transport facilities
Jharkhand	Over staff, transport facilities and Expenditure	Tripura	Over staff and transport facilities
Karnataka	Over staff, transport facilities	Uttara Pradesh	-----
Kerala	-----	Uttarkhand	Over staff and transport facilities
Madhya Pradesh	Over staff	West Bengal	Over staff, transport facilities and Expenditure
Maharashtra	Over staff, transport facilities and Expenditure	Delhi ot	-----

Source: Author's Calculations

Conclusions

The study conducted efficiency analysis of Indian Police covers 30 states. The results of an average technical efficiency for during 2015 revealed that only 4 states are efficient on production frontier. Kerala, Delhi, Bihar and Uttar Pradesh are efficient DMUs under the constant return of scale assumption. This implies the need to invest in human capital by training the staff properly and equipping the Police with modern equipment and machinery, so that States can operate at the optimal level.

The results explain policy measure for Indian Police. Policy suggestions are as follows;

- The results reveal that the majority of the states are operating below efficient level. Therefore, it is better to set up yearly efficiency targets for each DMU's.
- The Police department set the goals in coordination with the civil society and collectively they can ensure better law and order situation and improve efficiency.

- After setting targets, monetary incentives should be given for achieving these targets.

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