DOI : 10.18843/rwjasc/v8i2/04
DOI URL : http://dx.doi.org/10.18843/rwjasc/v8i2/04

URBAN LOCAL SELF GOVERNMENT IN INDIA: INFRASTRUCTURE DEVELOPMENT AND PERFORMANCE ANALYSIS

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ABSTRACT

Urban Local Self Governments play the major role in urban development process in India. This level of governments has enormous functions and inadequate source of finances. These governments invest surplus of own source over revenue expenditure along with external sources (grant and other fund) for infrastructure development. This paper establishes that performance measurement and classification of urban local self governments can be made on the basis of infrastructure development using indicators measured in purely financial parameters. Empirical study is based on state wise data. Multiple and binary regression analysis have been applied on the consolidated financial results under a state. Empirical study shows that the concept used in the paper has a strong base and therefore can be accepted.

Keywords: Urban Local Self Governments, Urban Infrastructure Development, Performance Measurement and Classification, Regression Analysis, Logistic Regression Analysis.

INTRODUCTION:

Governments at all levels have to play a major role in developing urban infrastructure which strengthens the base of an economy. Indian Constitutionhas provided for a three tiers federal structure (Union, State and Local) specifying the powers and responsibilities for all the tires of the governments. Therefore, it is the desired intention of the Constitution that all the tiers of the Governments work in a co-ordinated manner well within limits of the Constitution for urban infrastructure development. Third tier of Governments are generally termed as local self-governments and it has two wings, one which operates in the rural areas and the other in the urban areas. Constitutional status has been provided to these local governments through the 73th and 74th Constitutional Amendment Acts, 1992. Local self-governmentoperating in urban areas are commonly known as "Urban Local Self Governments".Prior to the Amendment Act, the plan for local infrastructure development were used to be drawn by the upper tier governmentswhere local requirement would not be considered. Therefore, the amendment is a direction to the state governments for transfer of power and responsibilities to the local governments with respect to preparation of plans for economic development and social justice, and also for the implementation of development schemes as may be required to enable the local governments to function as institutions of self-government. Unfortunately the issue of empowerment of the local self-governments has been left at the discretion of the state governments and as a result legislation primarily aims to make urban local bodies accountable to their stategovernment rather than to the citizens (The World Bank, 2007).Urban Local Self Governments (hereinafter referred to as ULSG) are of three types: (i) Nagar Panchayats for areas in transition from a rural area tourban area; (ii) Municipal Councils for smaller urban areas; (iii) Municipal Corporations for larger urban areas.

India is also in the stage of rapid urbanization like other countries in the World and the constitution has provided different and concurrent list of works for different levels of governments. The role of ULGs, after becoming statutorily responsible for providing basic infrastructural facilities and maintenance of the same in the urban areas, has become more and more important.ULSGs find it difficult to balance between the limited financial resources and the unlimited needs for public services. (Tesu, 2011).

FINANCIAL ANALYSIS OF ULSGs:

ULSGs are statutorily responsible to carry out decentralized functions effectively and this requires presence of two important elements: adequate level of revenue either raised locally or transferred from the central government and the authority to make decisions about expenditures (Meddzi and Gondo, 2010). Finance of ULSGs consists of two major sources: own source and external source. Own source of receipts basically includes tax and non-tax receipts within the assigned power whereas external source constitutes a major portion of grant and assignments from upper tiers including contribution from others, loan from bank or financial institution and fund raised through issue of bonds.

Psycharis and Iliopoulou(2016) have commented that local municipalities in Greece have a limited extent of tax or other forms of fiscal autonomy and therefore still rely heavily on fiscally centralized revenue sources. This situation also prevails in the ULSGs in India. Several literaturesshow that the dependency is due to the constitutional imbalance between the enormous functions and legitimate source of finances. ULSGs in India have lowest tax base (property tax, advertisement tax etc.)and upper tiers enjoy higher tax bases. Therefore,funds collected by the upper tiers are devolved to the lower levels of governments but not at the desired level. In order to resolve the imbalance, the amendment act has stated for constitution of state finance commission in every state which in addition to finance commission constituted by the central government. Boththe upper tier governments have shown their negative attitude towards accepting all the recommendations of the finance commissions. Report of the twelfth Finance Commission, on the other hand, states that various studies do indicate that local bodies have not been enthusiastic about raising revenues.

There are two types of expenditure in ULSGs: revenue and capital. Revenue expenditure is incurred for administrative and maintenance purposes whereas capital expenditure is for creation of basic urban infrastructure facilities for the people of its area. Higher degree of fiscal decentralisation entails increased reliance on locally raised revenue to provide basic social, infrastructural, and economic development services. So,redistribution of expenditures should be allowed to crowd out economic development investment at the local level(Psycharis, et al., 2016; Xu et. al., 2016). Therefore, it is desirable that an ULSG should meet its revenue expenditure out of its own source income and the resultant [either positive (surplus) or negative (deficit)] may be invested for creation of infrastructural facilities ie., capital expenditure. Though ULSGs are statutorily not allowed to place revenue deficit budget (Mohanty, Misra, Goyal, & Jeromi, 2007) but actual results of most of

the ULSGs, in reality, show deficit.

URBAN INFRASTRUCTURE DEVELOPMENT BY ULSGs:

We are concerned with the studies of urban infrastructure development by ULSGs and diagram 1 is presented for better understanding of the urban infrastructure development process by ULSGs.
Central and state governments employ their funds directly in the process of urban infrastructure development or through lower tiers. Therefore, ULSGs receive funds from central government either through direct transfer or through state governments. State government transfers such fund and also contribute its own fund to ULSGs. Therefore, ULSGs invest all these along with the amount out of balance in revenue account ie., surplus for a year or accumulated over the years in urban infrastructure development.
It may also be noted that ULSGs may have revenue deficit for a particular year where ULSGs have no other option than to use either the balance accumulated in revenue account or external sources to meet the excess revenue expenditure over own source receipts. This reduces the amount of capital expenditure resulting in less investment in urban infrastructure development.

PURPOSE OF OUR STUDY:

The objective of our paper is to find out the trend of urban infrastructure development by the ULSGs in India and to use it for performance measurement and classification of ULSGs in a simplest manner through application of statistical methods using minimum number of purely financial indicators supported by a validation process.
Classification of performance can be made in several ways and it is a well-established norm that a trend of performance with respect to particular indicators be found out and be compared with the actual of a particular period to measure the performance. We know that the ULSGs are under direct control of the state governments and therefore we can find out a trend of infrastructure development by ULSGs for the country as a whole considering financial data of different states (considering the total of all types ULSGs) for a block of years. It is expected that state wise ULSGs will perform at least as per the trend in subsequent year. This may be stated as the trend value and can be compared with actual value for performance measurement.It is also necessary to verify whether the performance measurement on the basis of our concept is well explained or not.

RATIONALE OF THE STUDY:

Our extensive literature review reveals that most of the researchers have considered innumerable financial and non-financial parameters/ indicators in their studies relating to performance measurement of ULSGs. So far as the studies on Indian ULSGs are concerned, we have found that most of these are based on descriptive analysis and without any validation through application of statistical method. Mohanty et al. (2007) had set their objective to analyse performance of urban local bodies in the provision of civil infrastructure but their approach was different.

LITERATURE REVIEW:

We have conducted literature review with respect to selection of indicators and methodology used. Purpose of analysis is an important factor for selection of variables (indicators) and a research paper should contain those variables which are able to focus on the attainment of the objective. 'Selection of required variables from a large number of variables usually depends upon the level of analysis otherwise it becomes difficult to determine or predict the response or answer. So elimination of topics or categories is required for arriving at a smaller, controllable number.' (Hernandez-Moreno & Hoyos-Martinez, 2010). 'Number of variables in comparative indicators, either distinctively or combined into more useable and easily understandable one, should have ability to focus on indicator's ability and to assess the result' (Kloha, Weissert, & Kleine, 2005).Performance measurement study can be conducted using descriptive and analytical methods based on secondary data (Jurnali & A.K. Siti-Nabiha, 2015). It can also be assessed by both the parametric econometric specifications and nonparametric approaches (Sharma & Sharma, 2015).
Regression methodology is the most widely used tool for analysis of data and interpretation of result in local government studies. (Psycharis & Iliopoulou, 2016) in their study of decentralisation and fiscal autonomy aspects of Greek municipalities during the period 1999–2009 have used regression methods on several socioeconomic and demographic criteria along with political factors as dependent variables. (Jimenez, 2015), on the other hand, has

focussed on static and dynamic aspects of fiscal performance in overlapping localgovernments of USA and considered own-source revenues, debt and current expenditures as variables. (Palus, 2010) has selected local spending activity as dependent variable because local governments respond to public opinion and elected officials must to adhere to citizen preferences. Zoltan, Hajnal and Trounstine (2010) have repeatedly used regression on numerous financial and non-financial variables and used correlation coefficient ($r > .40$) for dropping of variables on the data of localities during 1986 to 2001as per International City/County Manager's Association Surveys (ICMA). (Xu & Warner, 2016) have used multilevel regression models of local government fiscal effort (locally raised revenuenormalized by population and income) of all county areas in the continental United States forthe period 2002–2007. (Bhattacharyya & Bandyopadhyay, 2012) have uniquely used dummy dichotomous independent variables for presence or absence of financial controls along with other variables in regression analysis to assess the impact of financial control in expenditure management.

Result of the regression analysis also help to draw conclusion that competence of service delivery and consolidated governance structure are weakly associated with full-time jobs growth and greater population growth respectively (Greasley, John, & Wolman, 2011).

Analysis through logistic regression does not require the restrictive assumptions with respect to normal distribution of independent variables or equal dispersion matrices nor concerning the prior probabilities of failure (Ohlson, 1980); (Zavgren, 1985). It should have a base that the dependent variable should be dichotomous. (Lee, 2004) finds logistic regression as helpful for prediction on the basis of the presence or absence of a characteristic or outcome based on values of a set of predictor variables. We find use of binary logic regression in local government study to identify the predictor of financial dependency across three main ethnic groups among older persons in Malaysia using a sampling frame from Kajang municipality. (Yin–Fah, Hamid, Masud, & Paim, 2010).

METHODOLOGY:

Dependent and Independent variables:

Primary questions before us are:(i) whether we can proceed to measure the performance and classification of ULSGs in India on the basis of infrastructure development, and if so, (ii) what will be the financial indicators for this purpose? Financial analysis showsthat ULSGs can contribute the amount of surplus in revenue balance (own source – revenue expenditure) on their part for capital expenditure in the process of urban infrastructure development along with external sources. Therefore two functional relationships can be established where amount of capital expenditure is dependent variable and the independent variables may be as follows:

a. amount of (Own Source, Revenue Expenditure, External Source), or
b. amount of (Revenue surplus/deficit, External Source)

In our study, we have proceeded considering the above variables which are elaborated in stages for empirical study.

RESEARCH METHODOLOGY:

We have stated earlier that classification of performance can be made in several ways and a trend of performance with respect to particular indicators can be found out for comparison with the actual performance of a particular period. Several researchers have used several statistical techniques in the area of financial analysis but regression analysis is the simplest and widely used technique. Multiple Regression methodology is used to establish a relationship between dependent variable and independent variables (more than one). The equation of such relationship may be with or without intercept. The functional form of this methodology in our study is without any intercept and it is in the form of:

$Y_i = A_1x_{i1} + \ldots\ldots + A_{mxim} + e_i$, i = 1, 2, …. n.

(b) Binary Logistic Regression for validation:

Logistic regression is used where prediction is based on presence or absence of a characteristic or outcome along with a set of predictor variables. This is similar to a linear regression model but the dependent variable is dichotomous and the probability of the event must lie between0 and 1.

We have used this model for validating the model derived from multiple regression analysis. We have considered the performance as categorical dependent variable and independent variables are the set of variables not selected for multiple regression analysis. The formula of relationship is:

$z_i = \beta_0+\beta_1x_{i1}+\beta_2x_{i2}+\ldots+\beta_px_{ip,}$ *where*

x_{ij}= the j^{th} predictor for the i^{th} case, β_j=is the j^{th} coefficient, p= the number of predictors, βs= the regression

coefficients of the independent variables estimated through an iterative maximum likelihood method.

Data:

Theoretical concept should be supported by an empirical study for acceptability and the matter of availability of data is the most important matter to conduct an empirical study. Our study needs data for the country as a whole. (Tabassum, Kaleem, & S., 2015) have advocated for real earning management instead of accrual earnings management for performance analysis of firms to minimise the scope of manipulation. This aspect is also relevant for selection of data in our study. Though accrual basis has been applicable in ULSGs from 2007 but we have relied on data of actual receipts and expenses published by central finance commission from time to time. Latest data for all types of ULSGs were available for the period from 2002-03 to 2007-08 in the website of Thirteenth Finance Commission and these have been used for our empirical study as no data thereafter for the country as a whole are available. We think that the concept of a research paper is important and that is why we find period involve in the studies are '1986 to 2001' (Hajnal & Trounstine, 2010), 1999-2009 (Psycharis and Iliopoulou, 2016) and 2002-07 (Xu and Warner (2016).As our paper is related with infrastructure development, we have taken year wise data for those states where amount of capital expenditure appears.

Stages for Empirical study:

So far as the objective of our study is concerned, we can proceed for use of financial data from 2002-03 to 2006-07 at the first stage in order to check the correlation between dependent variables for selection of a set of variables (a or b as stated under dependent and independent variables part) in regression analysis at the next stage. We will use SPSS ver.15 for analysis. We can accept the model as the trend of capital expenditure for urban infrastructure development provided results of regression are satisfactory. Next stage is to apply this model on the data of dependent variables of 2007-08 and to find out 'trend value of capital expenditure'. Subsequent stage is meant for measuring the performance through comparison of trend value actual capital expenditure of 2007-08. Performance of all types of ULSGs in a state is either good (actual> trend) or bad (actual<bad). A good research paper should contain a part for validation preferable using another statistical tool duly applied on separate set of dependent variables for better acceptance. Therefore, in the next stage, we have used binary logistic regression method considering performance as dependent variables (good=0 and bad=1) and another set of dependent variables (not used in regression analysis). Subsequent stage is analysis of result of logistic regression. Final stage is to draw conclusion whether the concept of classification used in our study is well explained or not. Total process is explained in diagram 2.

FINDINGS AND DISCUSSION:

Table 1shows that dependent variables as in (b) can be selected for regression analysis as the correlation coefficients of 'revenue surplus/ deficit' and 'own source' is less than 0.05. Relationship with capital expenditure as depicted in 'table 2' is 97% (adjusted R^2) is highly satisfactory. Results of collinearity statistics and diagnostics are good and therefore the relationship formed through 'unstandardized beta' values of the dependent variables can be accepted.

Now the model for the trend of infrastructure development on the basis of actual data from 2002-07 is: Capital Expenditure = 0.609*Revenue surplus/deficit + 0.921*External Sources.

'Table 3' indicates is for performance measurement where trend value of capital expenditure of all ULSGs under a state has been obtained after putting the values of revenue surplus/deficit and external sources of 2007-08 in the derived model. If actual of 2007-08 is more than the trend value of 2007-08, then the performance is good otherwise bad (represented by '0' and '1' for use binary logistic regression). It is observed from the table that ten numbers of states have performed well. We have considered other set of dependent variables (own source, revenue expenditure and external sources) in order to see whether classification made on the basis of one set of variables is well explained by other set of variables also. Table 4 shows that good, bad performances have been explained by 80% and 90.9%. The overall classification has been explained to the extent of 85.7% which is invariably satisfactory. The present study also estimates the Hosmer and Lemeshow statistic (table 5) and the observed significance level for Chi-square value is found to be 0.918, which means that there is no much difference between observed and predicted values. Therefore, the result shows that the model appears to fit the data reasonably well. The Chi-square value (3.245) of this model at the 0.01 significant levels indicates that logistic regression is very meaningful. The omnibus tests (Table 6) suggest for removal of variable from the model if significance of the change is large (i.e., greater than 0.10). As the value is 0.002, we can say that the predicted classification is not influenced by unjustified inclusion of dependent variables.

CONCLUSION:

Infrastructure development is the basic need for urban development and the ULSGs plays a major role in this development process through investment of own revenue surplus and external resources. Our paper establishes the concept that performance measurement and classification of ULSGs can be made on the basis of infrastructure development considering the indicators measured in purely financial parameters. We find a strong relationship between capital expenditure and combination of revenue surplus/ deficit and external source (97% reflected through adjusted R^2). Unstandardised beta value of external sources indicates that it is the more important contributor for capital for capital expenditure. Our paper also establishes that the procedure of computing trend value of a year and comparison with actual in subsequent year has a strong base for performance measurement and classification. Most important part of our empirical study is that the performance measurement on the basis of a set of variables is well explained (overall 85.7%) by other set of variables also in binary logistic regression. Therefore, we can conclude that the concept used in our study is reasonably acceptable for performance measurement and classification.

Bhattacharyya and Bandyopadhyay (2012) have stressed upon the need to shift from traditional way of descriptive analysis of financial ratio to using statistical techniques for analysis of financial performance in Urban Local Bodies in India and the research paper presented here is our first effort to that direction. Our study has used measurable financial indicators and there are ample scopes before the researchers and managerial personnel attached with the ULSGs administration to use our concept selecting other purely financial variables for performance measurement either on micro or macro basis.

More the use of fund, more the expenses for urban development but mobilisation of own revenue and higher utilisation of external fund in a judicious manner expedite the development process because most of the governments under third tier are dependent on grants devolved from upper tiers. Psycharis, Zoi and Iliopoulou (2016) and (Xu and Warner, 2016)have rightly stated that higher degree of fiscal decentralisation entails increased reliance on locally raised revenue to provide basic social, infrastructural, and economic development services and devolution is causing redistributive expenditures to crowd out economic development investment at the local level. ULSGs of India should be cautious about this observation.

It becomes difficult for citizens to find out the responsibility for poor fiscal performance in the absence of clear assignment of service responsibilities (Rodden, Eskeland, & Litvack, 2003). Higher expenditures for public infrastructures, specifically in case of more urbanised regions, increase a pressure to raise revenues or issue additional debt and fiscal austerity is the order of the day (Jimenez, 2015). Public expenditure management entails appropriate planning and spending; strengthening the expenditure control systems, evaluating and monitoring the expenditure control systems and evaluating and monitoring effectiveness of established systems. (Mbedzi & Gondo, 2010).In view of the above we like to place certain suggestion in present day perspectives:

(a) A major portion of grant is usually sent at the end of the year leaving a little scope for utilisation. Therefore, there is a need to use developed e-governance processfor timely remittance of grant and related information.
(b) Political intervention in decisions making process of the elected body should be avoided to restrictfund diversion and making unfruitful revenue expenditure often found in engaging casual labours or undertaking illegitimate repairing work as these minimisethe available amount for infrastructure development.
(c) Ideal urban infrastructure development process depends upon timely receipt of grants and subsequent release of grant depends on timely utilisation of earlier instalment. Therefore, ULSGs should adopt financial analysis and planning process to avoid such delays.
(d) Financial control at ULSG level is necessary to avoid fund diversion as well as for generating revenue surplus so that these governments also become a true contributor in the process of urban infrastructure development.

We have also applied regression analysis on the data of 2007-08 for our interest. It is observed that strong relationship between dependent and independent variables continues and collinearity statistics and diagnostics are satisfied as earlier.Therefore,continuous availability of data not only helps the researchersto verify prevalent concept and characteristics of the earlier data set with subsequent one but also paves the way for developing a better concept. The decision for not providing all India data, therefore, limits the scope of the researchers like us for further study. Instead of discontinuing the practice the commission may attach the condition for submission of financial result by all the ULSGs for release of performance grant and we request, through this paper, to reconsider its decision.

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FIGURE 1- INFRASTRUCTURE DEVELOPMENT BY ALL TIRES OF GOVERNMENT

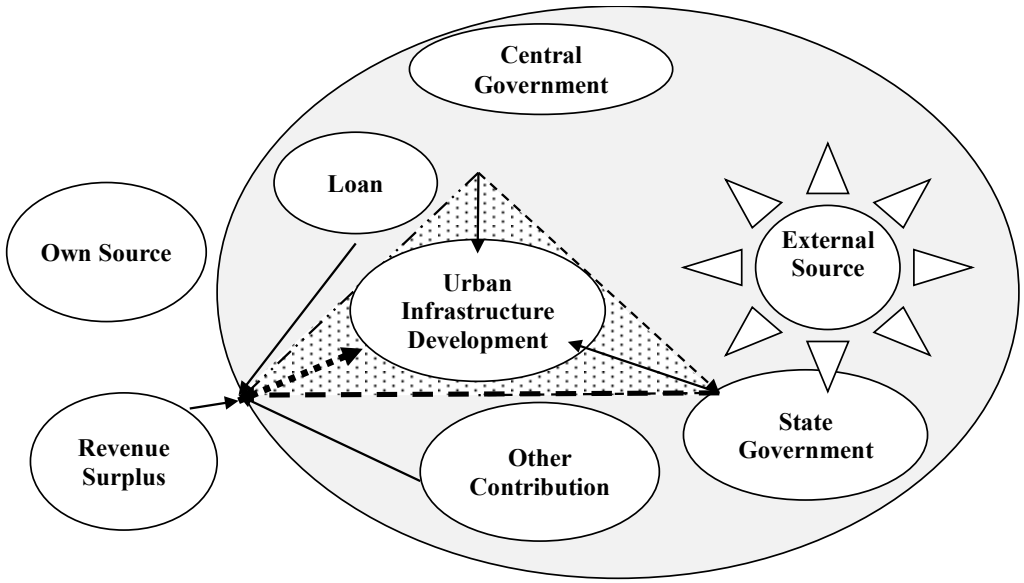

Table 1: Correlation Matrix (2002-07)

	Own Source	Revenue Expenditure	Revenue Balance	External Source
Own Source	1.000	.980	.708	.686
Revenue Expenditure	.980	1.000	.551	.793
Revenue Balance	.708	.551	1.000	.062
External Source	.686	.793	.062	1.000

Table 2: Result of Regression Analysis

Model Summary	**Actual 2002-07**		**Actual 2007-08**	
N	107		21	
R	0.985(b)		0.981(b)	
R Square(a)	0.970		0.963	
Adjusted R Square	0.970		0.960	
Coefficients(a,b)	**Revenue surplus/ deficit**	**External Source**	**Revenue surplus/ deficit**	**External Source**
Unstandardized Coefficients Beta	0.606	0.922		
Std. Error	0.029	0.016		
t value	20.818	56.725		
Significance	0.00	0.00	0.000	0.000
Collinearity Statistics				
Tolerance	0.989	0.989	0.981	0.981
VIF	1.011	1.011	1.019	1.019
Standard Error				
Collinearity Diagnostics(a,b)	**Dimension 1**	**Dimension 2**	**Dimension 1**	**Dimension 2**
Eigenvalue	1.105	0.895	1.137	0.863
Condition Index	1.000	1.111	1.000	1.147
Variance Proportions				
Revenue Balance	0.45	0.55	0.43	0.57
External Source	0.45	0.55	0.43	0.57

Figure 2: Stages for Empirical Study

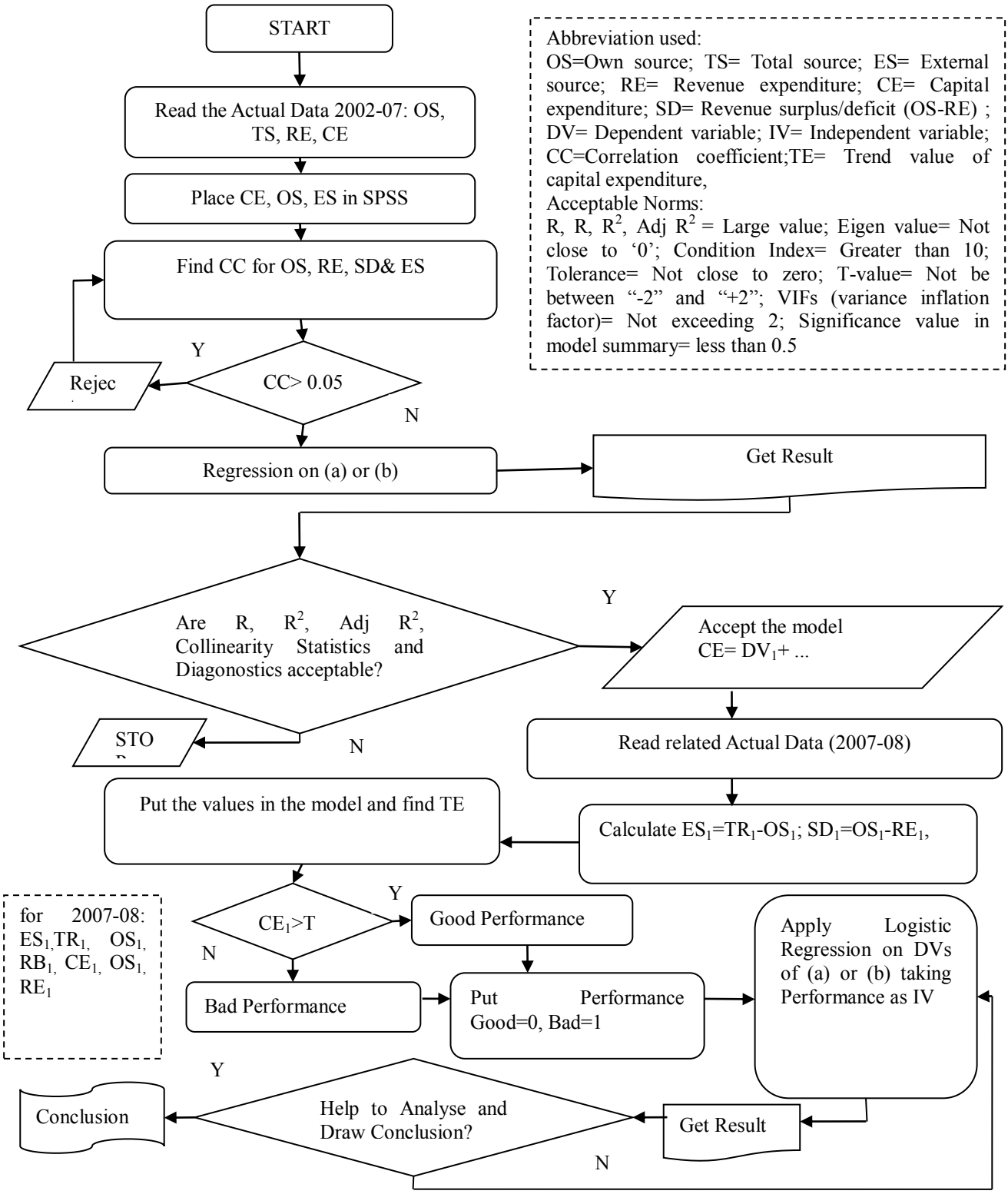

Table 3: Performance Measurement For 2007-08

Name of the States	Actual capital Expenditure	Trend value of capital Expenditure	Performance
Andhra	14382.444	6854.641842	Good= '0'
Assam	976.107	742.829942	Good= '0'
Chhatis	6531.4	7514.8246	Bad= '1'
Goa	105.41	105.98766	Bad= '1'
Gujarat	17556.3	13119.3602	Good= '0'
Hariyana	3690.2	3778.52	Bad= '1'
Jammu Kashmir	610	1523.0316	Bad= '1'
Jharkhand	2030.3	1976.7538	Good= '0'
Karnataka	19952.84487	17599.3851	Good= '0'
Kerala	3150.2	3031.921	Good= '0'
Madhya Pradesh	5816.1	5973.58308	Bad= '1'
Maharastra	65053.43	47395.55162	Good= '0'
Nagaland	24.9	30.1984	Bad= '1'
Orissa	2893.71152	3412.241581	Bad= '1'
Punjab	2325.9	1952.581	Good= '0'
Rajasthan	5750.31	7805.23346	Bad= '1'
Tamilnadu	16629.9	14310.05	Good= '0'
Tripura	251.285354	391.5022464	Bad= '1'
Uttar Pradesh	8637.9	16655.6746	Bad= '1'
Uttarakhand	176.3	666.4524	Bad= '1'
West Bengal	9395.887	5691.46092	Good= '0'

Table 4: Classification Table

	Observed		Predicted		
			Perfor		Percentage Correct
			0	1	0
Step 1	**Perfor**	0	8	2	80.0
		1	1	10	90.9
	Overall Percentage				**85.7**

a The cut value is .500

Table 5: Hosmer And Lemeshow Test

Step	Chi-square	df	Sig.
1	3.245	8	.918

Table 6: Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	15.187	3	.002
	Block	15.187	3	.002
	Model	15.187	3	.002
