Determinants of School Dropout Rates Across the Districts of Telangana and Andhra Pradesh States
An Econometric Study

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Abstract

Despite sizeable spending by the State on education at school level, millions of students in the age group of 6 to 13 are found out of school because of high dropout rates. Many studies found different factors responsible for this, such as literacy and poverty levels of parents, availability of adequate infrastructure facilities in schools, pupil-teacher ratio, trained teachers, distance and accessibility of school, etc. This study attempts to identify the important factors which determine the school dropout rate by using linear multiple regression method on cross section data of Telangana and Andhra Pradesh (the combined Andhra Pradesh) for the year 2013–14. For the purpose of formulation of appropriate policy, the determinants are identified in an order of their degree of influence. Prevailing literacy levels, percentage of rural population and pupil-teacher ratio in the district are found to be significant factors.

INTRODUCTION

Having realised the strategic importance of universal education for sustained economic development in late 1990s, the Government of India formulated and implemented different policies to achieve this objective which culminated into the

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enactment of Right of Children to Free and Compulsory Education Act, 2009 to all children between 6 to 14 years of age. Primary education should reach the millions of masses living in rural areas to ensure sustainable development. The enrolment ratio being far away from the set targets, the dropout rates have become serious impediments in the achievement of the objective of 'education for all'. A 2016 report by Montreal-based UNESCO Institute for Statistics and Global Education Monitoring says that 47 million students dropped out of school by the Class X [1].

As per the 2014 survey by the Ministry of Human Resource Development, Government of India [2], the gross enrolment ratio (GER: student enrolment as a proportion of the corresponding eligible age group in a given year) has increased at almost every level of education in India indicating that the educational system has become more accessible. Upper primary and secondary schools' GERs saw a

rise of 13 per cent and 17 per cent, respectively, in 2013–14 compared to 2007–08. Despite this increase, six million children aged between 6 and 13 are estimated to be still out of the school system.

This article makes an attempt to examine the various causes of school dropout rates at different levels of age groups among scheduled castes, scheduled tribes and other categories of students with the help of multiple regression technique applied for district-wise secondary data of two Telugu states (Combined State of Andhra Pradesh).

SCHOOL DROPOUT RATE: THE CONCEPTUAL DEFINITION

School dropout rate is the proportion of students who leave school during the year as well as those who complete the grade level but fail to enroll in the next grade level the following school year to the total number of students enrolled during the previous school year (Table 1). It reflects the obstacles for a social group to complete a specific level of education.

Table 1
Dropout Rates of All Categories of Students from 2001–02 to 2013–14

Year	Primary Level (IV)			Elementary Level (IVIII)			Secondary Level (IX)		
	Boys	*Girls*	*Total*	*Boys*	*Girls*	*Total*	*Boys*	*Girls*	*Total*
2001–02	35.36%	33.64%	34.54%	51.98%	55.77%	53.78%	71.62%	73.28%	72.37%
2002–03	33.74%	30.19%	32.39%	49.93%	53.22%	51.52%	67.46%	71.02%	69.12%
2003–04	42.42%	42.80%	42.61%	52.71%	55.92%	54.27%	65.08%	68.53%	66.70%
2004–05	31.77%	32.14%	31.95%	51.96%	54.46%	53.17%	62.30%	65.24%	63.69%
2005–06	24.61%	24.85%	24.73%	50.26%	52.37%	51.30%	62.24%	65.20%	63.67%
2006–07	26.76%	27.32%	2704%	42.14%	44.32%	43.22%	62.99%	65.33%	64.13%

2007–08	19.10%	18.48%	18.79%	33.26%	35.23%	34.24%	62.30%	64.00%	63.13%
2008–09	16.14%	15.15%	15.65%	34.39%	35.41%	34.89%	60.12%	61.38%	60.73%
2009–10	16.34%	15.24%	15.80%	26.38%	26.50%	26.44%	52.73%	54.02%	53.36%
2010–11	18.10%	16.73%	17.43%	22.56%	22.11%	22.34%	45.83%	46.59%	46.21%
2011–12	15.92%	15.27%	15.60%	21.51%	20.06%	20.79%	45.43%	45.99%	45.71%
2012–13	15.13%	15.45%	15.29%	27.14%	25.81%	26.48%	37.83%	37.80%	37.82%
2013–14	12.88%	12.60%	12.74%	26.56%	25.12%	25.85%	32.80%	32.47%	32.64%

Source: Educational Statistics of United Andhra Pradesh – Published by Commissioner and Director of School Education, Hyderabad, A.P. 2013–14, p. 89

Despite many programmes being initiated by the central and state governments for the improvement in the overall enrolment, heavy school dropout rates persisted resulting in wastage of public resources. As the figures in Table 1 show, the total dropout rate was 72% in 2001–02 and it has decreased to 32% by 2013–14. Although the dropout rate reduced significantly it was not closer to what was to be achieved. Inefficiency of education system and social disorganisation are the reasons for this. Other factors, such as family income level, low parental attitude towards learning, their educational level, unsuccessful migration, interest of children and unfavourable peer group influence on the academic achievement of students also contributed for high dropout rates. In the following section a brief review of some of the relevant research works is presented.

Review of Literature

A good number of research studies have been conducted in this area seeking to explain the factors responsible for high school dropout rates in India. In the following section some of the research works relevant for the present study are reviewed.

In a study conducted in Kerala, Pillai, Banjamin and Nair (1980) [3] find ill health, household work and poverty as main reasons for dropouts in primary education in Kerala. They also include large size of the family and lack of education being influential factors for dropouts. They also find that it was higher among boys than girls.

Shrivastava and Gupta (1980) [4] found in the survey of the dropout children, in the age group of 6–14 years in Ferozpur District in Punjab, that the number of dropout was high in rural areas than in urban areas; educational background of the parents was very poor which influenced the dropouts. Parents of dropouts were economically backward, the parents felt the need of child to work at home, unsympathetic teachers, dull curriculum, lack of utility of education, lack of interest in education and textbooks, lack of separate schools for girls and narrow

outlook of parents were some of the main reasons for dropout.

In a case study conducted in the Warangal district of erstwhile Andhra Pradesh, A. A. Acharya (1984) [5] found that "Mid-Day-Meal" (MDM) Scheme became a boon to the poor pupils and it also helped to a considerable extent in the increase of enrolment of students from the economically weaker section.

Rajaiah, B. (1987) [6] studied primary education in the state of Andhra Pradesh and concluded that the primary education development was very poor. An alarming dropout rate in Class I was found to be a serious constraint for achieving universalisation of primary education.

Rajan and Jaykumar (1992) [7] had conducted a study in 17 schools of Nagercoil Educational district of Kanyakumari in which they showed the impact of 'Chief Ministers Nutritious Noon-meal programme' (CMNNMP) or the 'Midday Meal' (MDM) on enrolment, attendance pattern and dropout rates of the primary school students. They compared the annual growth rates in these indicators before (1979–82) and after (1983–89) the starting of the programme. The result of their study clearly indicated that this programme raised the attendance and reduced the dropout rates among the students.

Mishra and Behera (2000) [8] have made a comparative study on the impact of 'Mid-Day-Meals' (MDM) Scheme in Odisha and Tamil Nadu states. And they found that the scheme has a tremendous impact on attending schools regularly among the primary-level tribal and other students in both the states. Similarly, this scheme has reduced the dropout rate of the target groups in the sample states.

In a study conducted on the basis of the unit level 64th round NSS data (2007–08), Sikdar and Mukherjee (2012) [9] listed out 20 reasons that contribute to school dropouts and they divided them into eight categories: (i) household atmosphere (parents not interested, no tradition in the community and education not considered necessary), (ii) access and infrastructure of school (inadequate number of teachers, school is far away, timing of educational institute is not suitable, unfriendly atmosphere in school, non-availability of lady teachers and non-availability of ladies' toilets, (iii) alternative source of work (to work for wage and salary and for participating in other economic activities and for helping in household work), (iv) household duties (look after younger siblings and to attend to other domestic chores), (v) financial constraints, (vi) quality of education (language or medium of instruction used unfamiliar, child not interested in studies and unable to cope or failure in studies), (vii) completed desired level/class, and (viii) other reasons.

School circumstances also play an important role in the dropout decision of children. Among others, student-teacher ratio is an

important determinant of the dropout phenomenon. Russell W. Rumberger and S. L. Thomas [10] in 2000 found that public, urban, and large schools and those with higher student–teacher ratios tended to have higher dropout rates.

METHODOLOGY

(a) **Objectives and Data Source:** Since the primary objective of this study is to provide quantitative estimates — the algebraic sign and numerical value — of some important determining factors of school dropout rates, this study is based on the secondary data sources — Educational statistics 2013–14 published by Commissioner and Director of School Education, Andhra Pradesh/Telangana, Hyderabad and NSSO 68th Round Survey on Consumer Expenditure for the year 2011–12. The model of data analysis is a linear multiple regression, i.e., the dependent variable 'school dropout rate' is regressed on some selected independent variables to measure the nature and strength of relationship between school dropout rate and the chosen explanatory variables. Another related important question in this regard is which variable is most important? The linear regression model yields estimates based on the measurement units of the included variables. To answer the question which

variables are relatively important we cannot compare the numeric values of the estimates of the unstandardised variables. To know the relative influence of the different explanatory variables on the dropout rate, we need standardised estimates which are estimates of the standardised variables. Very often for a given variable X its standardised variable is computed as $Z = (XmX)/sdX$ where mX is mean of X and sdX is standard deviation of X.

The following section presents the details related to data sources, model used, variables included and a priori algebraic signs of the parameters.

(b) **The Estimated Model:** A linear multiple regression model is used to estimate the relative influences of the chosen explanatory variables on school dropout rates.

DROPOUT_RATE = $bo + b1*$ PERCENT_RURALPOP + $b2$ *LITERACY_RATE + $b3$ * PUPIL_ TEACHER_RATIO + $b4$ * GER + $b5$ * MPCE + e

This model is estimated separately for three levels of education (Class I–V, Class I–VIII and Class I–X) and for three social categories (Others, SC and ST) producing nine sets of results.

(i) **DROPOUT_RATE (Dependent Variable School Dropout Rate):** It is expressed as a percentage of students who have dropped out of the total students enrolled for the given

academic year. The working formula is as follows: No. of students in Class I in 2009– No. of students in Class V in 2014.

For instance the dropout rate for the year 2009

$$= \frac{\text{No. of students in Class I in 2014} - \text{No. of students in Class V in 2014}}{\text{No. of students in Class I in 2009}}$$

Similar formulas are used for other levels of education and social categories, i.e., Class I–V, Class I–VIII and Class I–X; 'Others', SC and ST categories.

(ii) **PERCENT_RURALPOP (Percentage of Rural Population):** This is included in the model as an explanatory variable since many of the research studies found it to be influencing the dropout rate because of the lack of all-weather approach roads to the schools, low-level awareness and perception of parents in rural areas for the need for education of their children, etc. Hence, its coefficient b1 is expected to be positive (b1>0).

(iii) **LITERACY_RATE (Literacy Rate):** It is quite logical that a high literacy rate implies higher levels of education of parents and their awareness about its importance. Hence, literacy rate in a chosen geographical unit is expected to influence the dropout rate negatively in that region.

Therefore, its coefficient b2 is expected to be negative (b2<0).

(iv) **PUPIL_TEACHER_RATIO (Pupil-teacher Ratio):** One of the important factors responsible for retaining the student in the school is the adequate number of teachers, i.e., desirable pupil-teacher ratio. If more teachers are available, the dropout rate is expected to be low. Hence, the coefficient of this variable is expected to be negative (b3<0).

(v) **GER (Gross Enrolment Ratio):** It is defined as the number of students enrolled in a specific school level as a percentage of eligible children as per the official school age in that level. It is observed that a higher GER is normally associated with falling dropout rates. Hence, its coefficient b4 is expected to be negative (b4<0).

(vi) **MPCE: (Monthly Per Capita Consumption Expenditure):** It is an index of general economic status of the parent. A higher MPCE implies a high capacity of the parent to bear with the cost of the child's education as well as capacity to bear the loss of potential family income if the child also works. Therefore, its coefficient b5 is expected to be negative indicating that the dropout rate will be low for higher levels of MPCE (b5<0).

(c) Hypotheses

The a priori economic theory stipulates the algebraic signs for the coefficients of the explanatory variables. Hence, the following null and alternative hypotheses are formulated:

H0: (b1=0), (b2=0), (b3=0), (b4=0), (b5=0)

H1: (b1>0), (b2<0), (b3<0), (b4<0), (b5<0)

Therefore, one-tailed hypothesis testing is used and the test results are presented along with the corresponding level of significance with standard error and student's t-test.

The functional association between dependent variable and the independent variables is sought to be explained with the help of their correlation coefficients.

The average of all the variables in the three social categories and three levels of education are put together into a table for the purpose of comparisons.

The estimated regression coefficients—unstandardised and standardised—of the explanatory variables are presented along with their standard errors and the corresponding t-values separately for social category and school level as well as a consolidated table for all.

The overall goodness of fit of the model is judged on the basis of R2 and Analysis of Variance with F-test.

The statistical reliability of the estimates of multiple linear regression is judged on the basis of second order econometric tests, such as multicolinearity, heteroskedasticity and auto correlation. The traditional test for multicolinearity is inspecting the numerical value of the correlation coefficient between any two independent variables. If it exceeds 0.8 then it is understood that there is a strong correlation between explanatory variables rendering the OLS estimates as 'indeterminate'.

The problem of heteroskedaticity occurs when some of the important explanatory variables are omitted by the model. In such a situation the error term is strongly correlated with the explanatory variable causing the OLS estimates to be biased and their variances being not minimum. The easiest way of testing this problem is to plot the residuals and see if their distribution is normal.

The computer generated SPSS output of the estimated sets of results are presented in Appendix I and interpreted in the following section. The error term variation graphs are presented in Appendix II.

RESULTS, ANALYSIS AND DISCUSSION

As stated earlier, multiple linear regression is estimated for nine models, i.e., three school levels and three social categories. The regression results of these nine models are separately presented in tables numbered from 4 to 12. The means of dependent and independent variables of all the nine models or sets are presented in Table 2. Further, the unstandardised and standardised regression estimates or coefficients of the nine sets are presented in Tables 3a and 3b. These tables provide us an easy comparative understanding of the difference of the means and coefficients among three school levels and three social categories.

As the figures in Table 2 indicate, there is a striking pattern of dropout rates among social categories in all the school levels. From the accumulated school level of 1 to 10, the dropout rate in 'Others' category is 26.32 per cent in percentage, in SC category 35.36 per cent and in ST category it is more than double of the others category at 59.05. Thus one of the important findings from this study is that school dropout rates are highest among ST community followed by SC and Others.

Table 2
Category-wise Average of Dropout Rate and Other Explanatory Variables (in percentage)

Variable	Level I to V			Level I to VIII			Level I to X		
	Others	SC	ST	Others	SC	ST	Others	SC	ST
Dropout_rate	7.91	11.51	25.65	18.38	27.31	47.65	26.32	35.36	59.05
Percent_ruralpop	68.24	68.24	68.24	68.24	68.24	68.24	68.24	68.24	68.24
Literacy_rate	66.29	62.16	50.90	66.29	62.16	50.90	66.29	62.16	50.90
Pupil_teacher_ratio	26.91	26.91	26.91	22.91	22.91	22.91	43.22	43.22	43.22
GER	93.73	111.61	120.96	94.16	101.35	106.98	88.57	95.89	96.69
MPCE	1522.99	1522.99	1522.99	1522.99	1522.99	1522.99	1522.99	1522.99	1522.99

Table 3(a)
Consolidated Statement of Unstandardised Regression Coefficients

Variable	Level I to V			Level I to VIII			Level I to X		
	Others	SC	ST	Others	SC	ST	Others	SC	ST
Percent_ruralpop	.083	.048	.370	-.337	.256	.019	-.104	.114	-.095

Literacy_rate	-1.368	-1.139	-1.870	-2.445	-.712	-2.447	-1.738	-.954	-1.979
Pupil_teacher_ratio	1.042	-.355	1.843	.707	.220	.407	-.059	-.113	.026
Ger	.664	.162	.065	.109	.328	.122	.730	.237	.106
Mpce	.007	.008	.015	.015	.008	.015	.010	.008	.013

Table 3(b)
Consolidated Statement of Standardised Regression Coefficients

Variable	Level I to V			Level I to VIII			Level I to X		
	Others	SC	ST	Others	SC	ST	Others	SC	ST
Percent_ruralpop	.131	.093	.461	-.471	.507	.025	-.121	.209	-.151
Literacy_rate	-.737	-.796	-.746	-1.161	-.513	-1.022	-.685	-.635	-1.003
Pupil_teacher_ratio	.336	-.139	.468	.188	.083	.101	-.042	-.127	.026
Ger	.459	.389	.170	.102	.688	.226	.454	.416	.212
Mpce	.242	.303	.399	.434	.316	.411	.246	.291	.422

Table 3a presents the unstandardised regression coefficients of all the nine sets while Table 3b consists of corresponding standardised regression coefficients of the nine data sets. It is important to first examine the sign, magnitude and the statistical reliability of these coefficients. These are found in Tables 4 to 12 for the said nine sets.

Tables 4, 5 and 6 (Appendix–I) present the regression results for three social categories in school level for Class I–V.

Table 4a (Appendix–I) presents the averages of the variables and 4b (Appendix –I)presents the correlation coefficients between each and other variables. The correlation coefficient between dropout rate and its explanatory variables indicate the nature and strength of the relationship. The correlation coefficient among the explanatory variables must be examined for the existence of multicolinearity problem. In this data set no value is exceeding 0.8 and hence there is no multi colinearity. Table 4c (Appendix–I) presents the model summary, i.e., R, R2, and adjusted R2 which indicate the overall fitness of the model. In other words it is the explanatory power of the estimated model. In this case the values are 0.757, 0.572 and 0.447 which are very satisfactory.

Table 4d contains the Analysis of Variance Summary giving the ratio of regression variation and residual variation and thereby computing the F ratio which is 4.553, significant at 0.008 which implies the high degree of goodness of fit of this model.

Table 4e (Appendix–I) presents the unstandardised and standardised regression coefficients and their

standard errors, t values and their significance levels. As per the priori criteria the algebraic signs of these coefficients are $(b_1 > 0)$, $(b_2 < 0)$, $(b_3 < 0)$, $(b_4 < 0)$, $(b_5 < 0)$. Out of the five regressors, percentage of rural population and literacy rate coefficients are in accordance with priori signs. To examine the relative importance of the regressors on the dropout rate, the standardised coefficients are used. As Table 4e shows the highest value of the coefficient is for literacy rate followed by GER and pupil- teacher ratio.

Table 5 presents the regression results of the data set relating to 'SC' in Class I–V. Compared to Table 4a where the average dropout rate was 7.9 in 'Others' category, it is 11.5 in case of SCs. All the correlation coefficients are in desired ranges except the one between GER and pupil-teacher ratio which is above 0.8. Overall there is no multicolinearity problem. The R^2 is 0.57 and the F value is 4.48 which show goodness of fit of the regression. The sign of the three estimated coefficients is as expected for percentage of rural population, literacy and pupil-teacher ratio. The highest value of the standardised estimate occurs with the literacy rate.

Table 6 presents the results for the data set of 'ST' category in the school level of 1 to 5. The average dropout rate in this category is 25.7 which is higher than SC and 'Others' categories. The correlation matrix does not show multicolinearity, the

R^2 and F tests also give good results. Except the coefficient of pupil teacher ratio, all other four coefficients' sign is as expected. The highest of the standardised coefficient is for literacy rate at 0.74 indicating the strong influence of it on dropout rate.

The graphical test for the existence of heteroskedasticity presents the error variation and variation in the estimated dependent variable in a two-dimensional graph. A systematic pattern of the scatter points suggests the presence of heteroskedasticity. The SPSS generated graphs Figures 1–3, in general, indicate that there is no problem of heteroskedasticity.

Tables 7, 8 and 9 (Appendix–I) present the regression results for three social categories in school level for Class I–VIII.

As the figures in Table 7 show, the average dropout rate in 'Others', SC and ST categories are 18.38, 27. 31 and 47.65, respectively in school level for Class I–VIII. In this data set multicoliearity is absent; R^2 and F values are significant. The algebraic sign is as expected in case of percentage of rural population and literacy rate. Further, literacy rate has a strong influence on the dropout rate as its standardised coefficient is the maximum at -1.16, -0.5 and -102 in the three social categories.

Tables 10, 11 and 12 (Appendix–I) contain the regression results of datasets relating to 'Others', SC and ST categories in school level for Class I–X.

The average dropout rates are 26.32 per cent, 35.36 per cent and

59.05 per cent in 'Others', SC and ST categories. There is serious multicoliearity problem in these three data sets. Other statistics are also good. As per the standardised coefficients data shown in Table 3b, the highest coefficient occurs again in case of literacy rate which is –0.685, –0.635 and –1.00 in 'Others', SC and ST categories.

Conclusion and Suggestions

This study is undertaken to examine the different factors which influence the school dropout rate among children at three different school levels, Class I–V, I–VIII and I–Xin three different social categories — 'Others', SC and ST. Treating school dropout rate as dependent variable, five explanatory variables are included in the model and linear regression is estimated for the nine possible datasets.

The results have shown the following patterns:

• The dropout rate is higher among ST and SC compared to 'Others' social categories based on the average dropout rate computed in the different datasets.

• In most cases the prevailing literacy rate turned out to be the most significant factor followed by percentage of rural population and pupil-teacher ratio in determining the dropout rate based on their standardised regression coefficients.

While literacy rate is a social factor the percentage of rural population may be understood as an economic factor. Thus, school dropout rate is determined both by social and economic factors.

Although gross enrolment ratio is rising steadily over time due to government policies aiming at improving infrastructure — both physical and human — higher rates of school dropout are persisting resulting in large numbers of children found out of school. Based on the results of this study, it is suggested that specific policies aiming at specific causes are essential. Spreading awareness among illiterate parents about the importance and benefits of education of their children is important. Offering free education in public schools coupled with mid-day meals, free books and clothes will go a long way in attracting the children to schools. Monitoring the effective implementation of schemes and policies is very essential.

Appendix — I

Table 4
Regression Results of Dataset: Others Category, Level I–V

Descriptive Statistics			
	Mean	*Std. Deviation*	*N*
Dropout_rate	7.9096	11.95619	23
Percent_ruralpop	68.2404	18.96397	23
Literacy_rate	66.2939	6.44088	23
Pupil_teacher_ratio	26.9130	3.86021	23
GER	93.7283	8.27089	23
MPCE	1522.9857	394.90229	23

Correlations							
		Dropout Rate	*Percent Ruralpop*	*Literacy Rate*	*Pupil Teacher Ratio*	*Ger*	*Mpce*
Pearson Correlation	Dropout_rate	1.000	.106	-.453	.249	.334	-.050
	Percent_ruralpop	.106	1.000	-.758	-.568	-.500	-.674
	Literacy_rate	-.453	-.758	1.000	.241	.315	.654
	Pupil_teacher_ratio	.249	-.568	.241	1.000	.217	.267
	GER	.334	-.500	.315	.217	1.000	.411
	MPCE	-.050	-.674	.654	.267	.411	1.000

Model Summary				
Model	*R*	*R^2*	*Adjusted R^2*	*Std. Error of the Estimate*
1	.757	.572	.447	8.89299

ANOVA						
Model		*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
1	Regression	1800.462	5	360.092	4.553	.008
	Residual	1344.451	17	79.085		
	Total	**3144.912**	**22**			

Coefficients					
Model	**Unstandardised Coefficients**		**Standardised Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
1 (Constant)	−8.455	65.867		−.128	.899
Percent_ruralpop	.083	.221	.131	.374	.713
Literacy_rate	−1.368	.507	−.737	−2.698	.015
Pupil_teacher_ ratio	1.042	.646	.336	1.611	.126
GER	.664	.272	.459	2.441	.026
MPCE	.007	.007	.242	1.059	.304

Table 5
Regression Results of Dataset: SC Category, Level I–V

Descriptive Statistics			
	Mean	**Std. Deviation**	**N**
Dropout_rate	11.5117	9.87123	23
Percent_ruralpop	68.2404	18.96397	23
Literacy_rate	62.1557	6.89749	23
Pupil_teacher_ratio	26.9130	3.86021	23
GER	111.6052	23.65894	23
MPCE	1522.9857	394.90229	23

Correlations		**Dropout Rate**	**Percent Ruralpop**	**Literacy Rate**	**Pupil Teacher Ratio**	**GER**	**MPCE**
Pearson Correlation	Dropout_rate	1.000	.144	−.611	.233	.243	.023
	Percent_ ruralpop	.144	1.000	−.607	−.568	−.787	−.674
	Literacy_rate	−.611	−.607	1.000	−.037	.190	.533
	Pupil_ teacher_ratio	.233	−.568	−.037	1.000	.809	.267
	GER	.243	−.787	.190	.809	1.000	.627
	MPCE	.023	−674	.533	.267	.627	1.000

Model Summary				
Model	*R*	*R²*	*Adjusted R²*	*Std. Error of the Estimate*
1	.754	.569	.442	7.37520

ANOVA						
	Model	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
1	Regression	1219.015	5	243.803	4.482	.009b
	Residual	924.690	17	54.394		
	Total	**2143.706**	**22**			

Coefficients						
Model		*Unstandardised Coefficients*		*Standardised Coefficients*	*t*	*Sig.*
		B	*Std. Error*	*Beta*		
1	(Constant)	58.903	49.228		1.197	.248
	Percent_ruralpop	.048	.206	.093	.234	.818
	Literacy_rate	−1.139	.393	−.796	−2.899	.010
	Pupil_teacher_ratio	−.355	.818	−.139	−.435	.669
	GER	.162	.196	.389	.827	.420
	MPCE	.008	.007	.303	1.120	.278

Table 6
Regression Results of Dataset: ST Category, Level I–V

Descriptive Statistics			
	Mean	*Std. Deviation*	*N*
Dropout_rate	25.65	15.19	23
Percent_ruralpop	68.24	18.96	23
Literacy_rate	50.90	6.06	23
Pupil_teacher_ratio	26.91	3.86	23
GER	120.96	39.79	23
MPCE	1522.99	394.90	23

Correlations							
		Dropout Rate	*Percent Ruralpop*	*Literacy Rate*	*Pupil Teacher Ratio*	*GER*	*MPCE*
Pearson Correlation	Dropout_rate	1.0000	.2830	−5213	.1209	.0299	−1765
	Percent_ruralpop	.2830	1.0000	−.6268	−.5679	−6519	−6744
	Literacy_rate	−5213	−.6268	1.0000	.4016	.4361	.6304
	Pupil_teacher_ratio	.1209	−.5679	.4016	1.0000	.6336	.2669
	GER	.0299	−.6519	.4361	.6336	1.0000	.4746
	MPCE	−1765	−6744	.6304	.2669	.4746	1.0000

Model Summary				
Model	R	R²	Adjusted R²	Std. Error of the Estimate
1	.715	.511	.367	12.08564

ANOVA						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2591.097	5	518.219	3.548	.022
	Residual	2483.064	17	146.063		
	Total	**5074.161**	**22**			

Coefficients						
Model		Unstandardised Coefficients		Standardised Coesfficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.819	47.750		.310	.760
	Percent_ruralpop	.370	.235	.461	1.574	.134
	Literacy_rate	-1.870	.593	-.746	-3.154	.006
	Pupil_teacher_ratio	1.843	.933	.468	1.975	.065
	GER	.065	.096	.170	.678	.507
	MPCE	.015	.010	.399	1.554	.139

Table 7
Regression Results of Dataset: Others, Level: I–VIII

Descriptive Statistics			
	Mean	*Std. Deviation*	*N*
Dropout_rate	18.3822	13.56819	23
Percent_ruralpop	68.2404	18.96397	23
Literacy_rate	66.2939	6.44088	23
Pupil_teacher_ratio	22.9130	3.60445	23
GER	94.1600	12.76836	23
MPCE	1522.9857	394.90229	23

Correlations		*Dropout Rate*	*Percent Ruralpop*	*Literacy Rate*	*Pupil Teacher Ratio*	*GER*	*MPCE*
Pearson Correlation	Dropout_rate	1.000	.031	-.488	.341	.108	.059
	Percent_ruralpop	.031	1.000	-.758	-.392	-.117	-.674
	Literacy_rate	-.488	-.758	1.000	.103	.126	.654
	Pupil_teacher_ratio	.341	-.392	.103	1.000	-.058	.216
	GER	.108	-.117	.126	-.058	1.000	.250
	MPCE	.059	-.674	.654	.216	.250	1.000

Model Summary				
Model	*R*	*R^2*	*Adjusted R^2*	*Std. Error of the Estimate*
1	.808	.652	.550	9.10145

ANOVA						
	Model	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
1	Regression	2641.886	5	528.377	6.379	.002
	Residual	1408.219	17	82.836		
	Total	**4050.105**	**22**			

Coefficients					
Model	*Unstandardised Coefficients*		*Standardised Coefficients*	*t*	*Sig.*
	B	*Std. Error*	*Beta*		
1 (Constant)	154.325	52.404		2.945	.009
Percent_ruralpop	-.337	.189	-.471	-1.787	.092
Literacy_rate	-2.445	.511	-1.161	-4.790	.000
Pupil_teacher_ratio	.707	.622	.188	1.135	.272
GER	.109	.158	.102	.687	.501
MPCE	.015	.007	.434	2.083	.053

Table 8
Regression Results of Data Set: SC, Level: I–VIII

Descriptive Statistics			
	Mean	*Std. Deviation*	*N*
Dropout_rate	27.3148	9.56552	23
Percent_ruralpop	68.2404	18.96397	23
Literacy_rate	62.1557	6.89749	23
Pupil_teacher_ratio	22.9130	3.60445	23
GER	101.3461	20.07886	23
MPCE	1522.9857	394.90229	23

Correlations		*Dropout Rate*	*Percent Ruralpop*	*Literacy Rate*	*Pupil Teacher Ratio*	*GER*	*MPCE*
Pearson Correlation	Dropout_rate	1.000	.006	–.502	.459	.416	.170
	Percent_ruralpop	.006	1.000	–.607	–.392	–.823	–.674
	Literacy_rate	–.502	–.607	1.000	–.098	.229	.533
	Pupil_teacher_ratio	.459	–.392	–.098	1.000	.662	.216
	GER	.416	–.823	.229	.662	1.000	.655
	MPCE	.170	–.674	.533	.216	.655	1.000

Model Summary				
Model	R	R²	Adjusted R²	Std. Error of the Estimate
1	.799	.639	.533	6.54023

ANOVA						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1285.813	5	257.163	6.012	.002
	Residual	727.168	17	42.775		
	Total	2012.981	22			

Coefficients						
Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.158	45.574		.091	.928
	Percent_ruralpop	.256	.204	.507	1.254	.227
	Literacy_rate	-.712	.356	-.513	-1.998	.062
	Pupil_teacher_ratio	.220	.581	.083	.379	.709
	GER	.328	.211	.688	1.552	.139
	MPCE	.008	.006	.316	1.328	.202

Table 9
Regression Results of Data Set: ST, Level VI–VIII

Descriptive Statistics			
	Mean	Std. Deviation	N
Dropout_rate	47.6452	14.49915	23
Percent_ruralpop	68.2404	18.96397	23
Literacy_rate	50.9048	6.05727	23
Pupil_teacher_ratio	22.9130	3.60445	23
GER	106.9843	26.86056	23
MPCE	1522.9857	394.90229	23

Correlations		Dropout Rate	Percent Ruralpop	Literacy Rate	Pupil Teacher Ratio	GER	MPCE
Pearson Correlation	Dropout_rate	1.000	.157	-.641	.115	-.040	-.099
	Percent_ruralpop	.157	1.000	-.627	-.392	-.851	-.674
	Literacy_rate	-.641	-.627	1.000	.188	.525	.630
	Pupil_teacher_ratio	.115	-.392	.188	1.000	.562	.216
	GER	-.040	-.851	.525	.562	1.000	.572
	MPCE	-.099	-.674	.630	.216	.572	1.000

Model Summary				
Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.788	.621	.510	10.15137

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2873.100	5	574.620	5.576	.003
	Residual	1751.855	17	103.050		
	Total	4624.955	22			

Coefficients		Unstandardised Coefficients		Standardised Coefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	125.533	44.218		2.839	.011
	Percent_ruralpop	.019	.252	.025	.077	.940
	Literacy_rate	-2.447	.493	-1.022	-4.968	.000
	Pupil_teacher_ratio	.407	.744	.101	.547	.591
	GER	.122	.174	.226	.700	.493
	MPCE	.015	.008	.411	1.892	.076

Table 10
Regression Results of Data Set: Others – Level: IX

Descriptive Statistics			
	Mean	Std. Deviation	N
Dropout_rate	26.3243	16.34406	23
Percent_ruralpop	68.2404	18.96397	23
Literacy_rate	66.2939	6.44088	23
Pupil_teacher_ratio	43.2174	11.65784	23
GER	88.5748	10.16887	23
MPCE	1522.9857	394.90229	23

Correlations		Drop-out Rate	Percent Rural-pop	Literacy Rate	Pupil Teacher Ratio	GER	MPCE
Pearson Correlation	Dropout_rate	1.000	.106	-.294	.237	.394	.030
	Percent_ruralpop	.106	1.000	-.758	.432	-.237	-.674
	Literacy_rate	-.294	-.758	1.000	-.623	.245	.654
	Pupil_teacher_ratio	.237	.432	-.623	1.000	-.074	-.250
	GER	.394	-.237	.245	-.074	1.000	.307
	MPCE	.030	-.674	.654	-.250	.307	1.000

Model Summary				
Model	R	R²	Adjusted R²	Std. Error of the Estimate
1	.604	.365	.178	14.81577

ANOVA						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2145.202	5	429.040	1.955	.138
	Residual	3731.619	17	219.507		
	Total	5876.821	22			

Coefficients					
Model	*Unstandardised Coefficients*		*Standardised Coefficients*	*t*	*Sig.*
	B	*Std. Error*	*Beta*		
1 (Constant)	71.011	81.433		.872	.395
Percent_ruralpop	-.104	.274	-.121	-.381	.708
Literacy_rate	-1.738	.942	-.685	-1.844	.083
Pupil_teacher_ratio	-.059	.360	-.042	-.163	.872
GER	.730	.328	.454	2.228	.040
MPCE	.010	.012	.246	.857	.403

Table 11
Regression Results of Data Set: SC – Level: IX

Descriptive Statistics			
	Mean	*Std. Deviation*	*N*
Dropout_rate	35.3591	10.37099	23
Percent_ruralpop	68.2404	18.96397	23
Literacy_rate	62.1557	6.89749	23
Pupil_teacher_ratio	43.2174	11.65784	23
GER	95.8900	18.19161	23
MPCE	1522.9857	394.90229	23

Correlations						
		Drop-out Rate	*Percent Ruralpop*	*Lit-eracy Rate*	*Pupil Teacher Ratio*	*GER*	*MPCE*
Pearson Correlation	Dropout_rate	1.000	.006	-.395	.195	.278	.120
	Percent_ruralpop	.006	1.000	-.607	.432	-.809	-.674
	Literacy_rate	-.395	-.607	1.000	-.653	.309	.533
	Pupil_teacher_ratio	.195	.432	-.653	1.000	-.265	-.250
	GER	.278	-.809	.309	-.265	1.000	.665
	MPCE	.120	-.674	.533	-.250	.665	1.000

Model Summary				
Model	*R*	*R²*	*Adjusted R²*	*Std. Error of the Estimate*
1	.615	.378	.195	9.30466

ANOVA					
	Model	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
1	Regression	894.460	5	178.892	2.066	.120
	Residual	1471.802	17	86.577		
	Total	**2366.263**	**22**			

Coefficients						
	Model	*Unstandardised Coefficients*		*Standardised Coefficients*	*t*	*Sig.*
		B	*Std. Error*	*Beta*		
1	(Constant)	57.357	59.036		.972	.345
	Percent_ruralpop	.114	.232	.209	.493	.628
	Literacy_rate	-.954	.516	-.635	-1.850	.082
	Pupil_teacher_ratio	-.113	.234	-.127	-.481	.637
	GER	.237	.223	.416	1.063	.303
	MPCE	.008	.008	.291	.971	.345

Table 12
Regression Results of Data Set: ST, Level: I–X

Descriptive Statistics			
	Mean	*Std. Deviation*	*N*
Dropout_rate	59.0452	11.95117	23
Percent_ruralpop	68.2404	18.96397	23
Literacy_rate	50.9048	6.05727	23
Pupil_teacher_ratio	43.2174	11.65784	23
GER	96.6874	24.00537	23
MPCE	1522.9857	394.90229	23

Correlations		Dropout Rate	Percent Ruralpop	Literacy Rate	Pupil Teacher Ratio	GER	MPCE
Pearson Correlation	Dropout_rate	1.000	.027	-.535	.194	.013	.003
	Percent_ruralpop	.027	1.000	-.627	.432	-.838	-.674
	Literacy_rate	-.535	-.627	1.000	-.372	.553	.630
	Pupil_teacher_ratio	.194	.432	-.372	1.000	-.162	-.250
	GER	.013	-.838	.553	-.162	1.000	.554
	MPCE	.003	-.674	.630	-.250	.554	1.000

Model Summary				
Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.736	.541	.406	9.20770

ANOVA						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1700.980	5	340.196	4.013	.014
	Residual	1441.288	17	84.782		
	Total	3142.269	22			

Coefficients						
Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	135.488	37.628		3.601	.002
	Percent_ruralpop	-.095	.252	-.151	-.378	.710
	Literacy_rate	-1.979	.460	-1.003	-4.300	.000
	Pupil_teacher_ratio	.026	.211	.026	.125	.902
	GER	.106	.167	.212	.634	.535
	MPCE	.013	.007	.422	1.743	.099

Appendix — II

Others:

Histogram
Dependent Variable: DROPOUT Rate

Scatterplot
Dependent Variable: DROPOUT Rate

SC:

Histogram
Dependent Variable: DROPOUT Rate

Scatterplot
Dependent Variable: DROPOUT Rate

ST:

Histogram
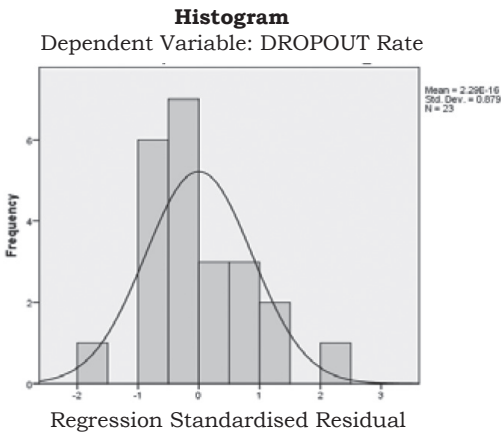Dependent Variable: DROPOUT Rate

Scatterplot
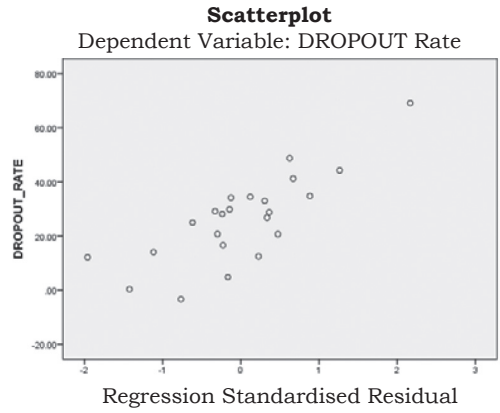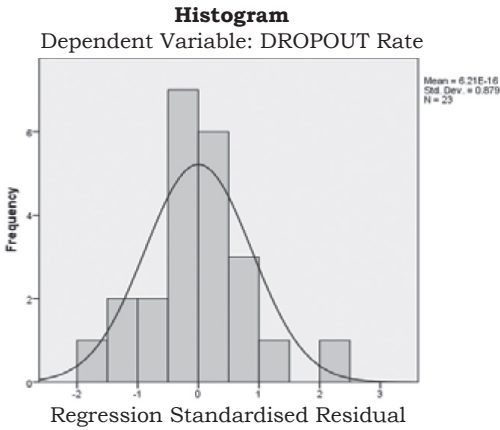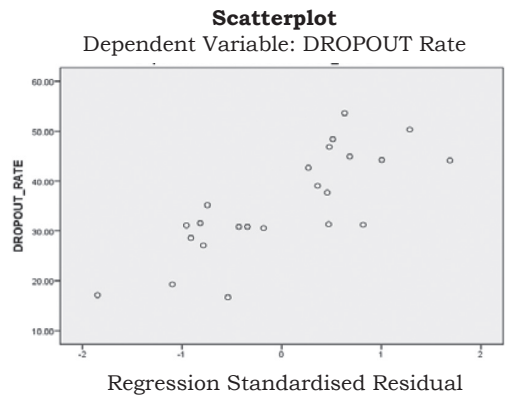Dependent Variable: DROPOUT Rate
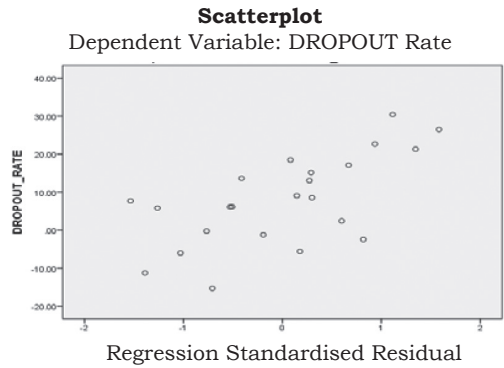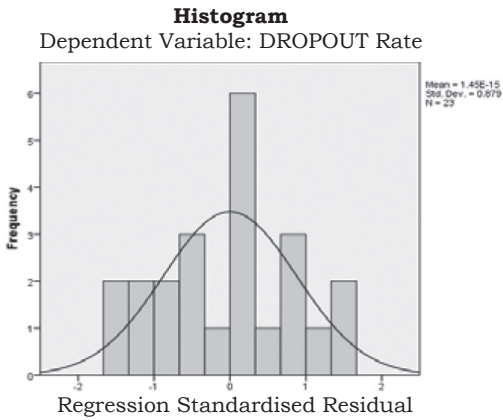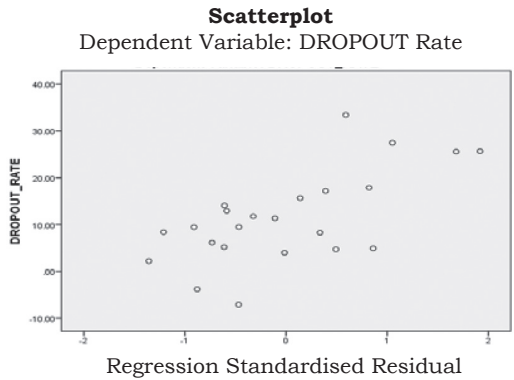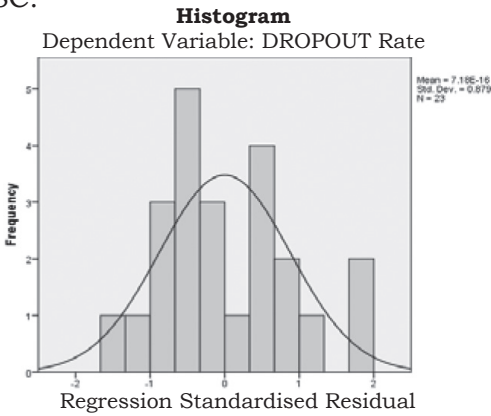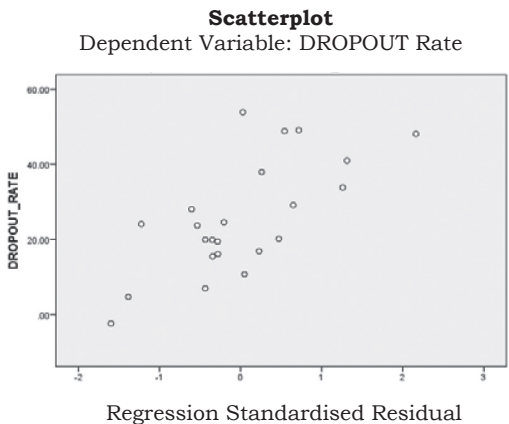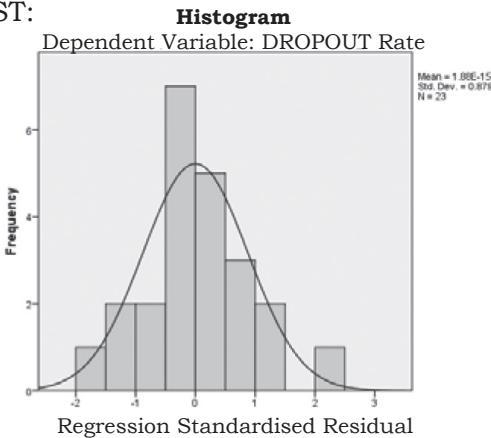
Figure 1. School Level I–V

Others:
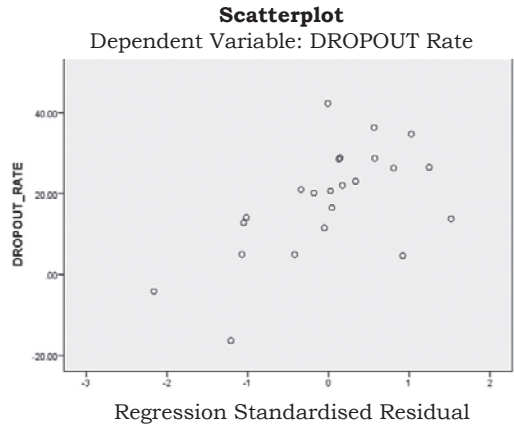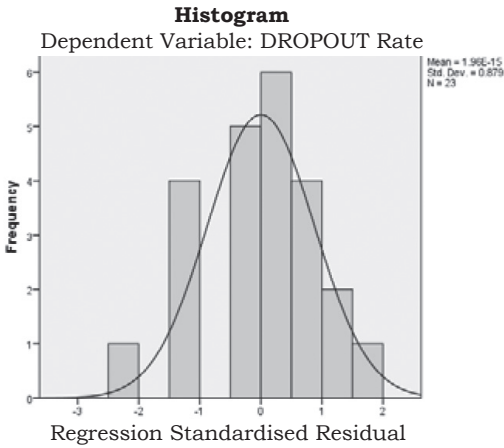
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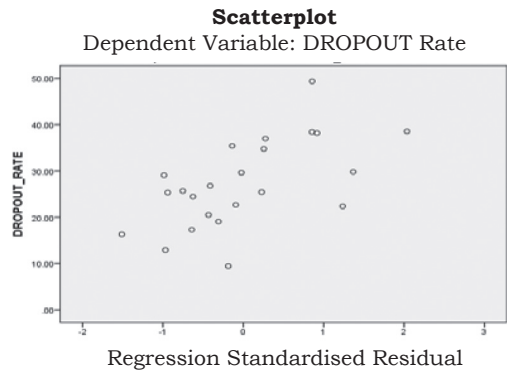
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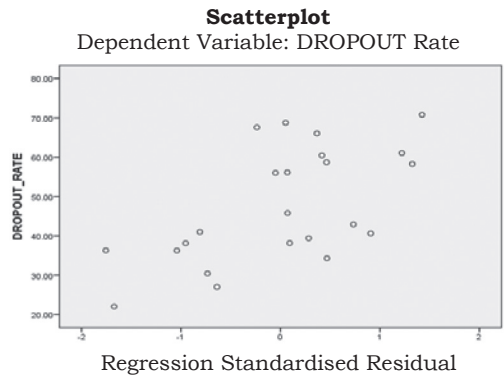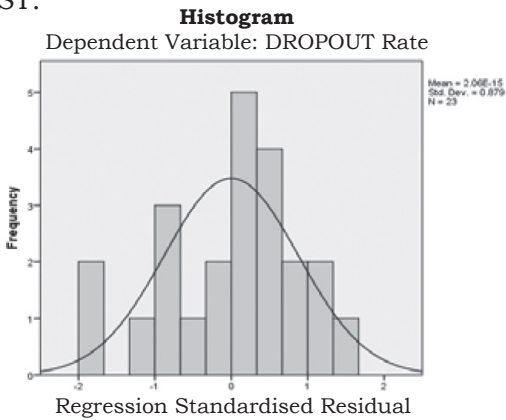
Figure 2. School Level I–VIII
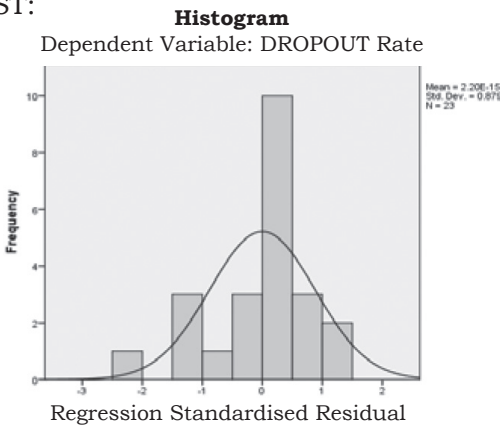
Others:

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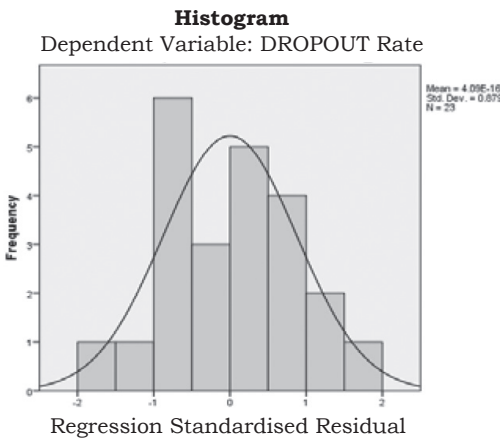
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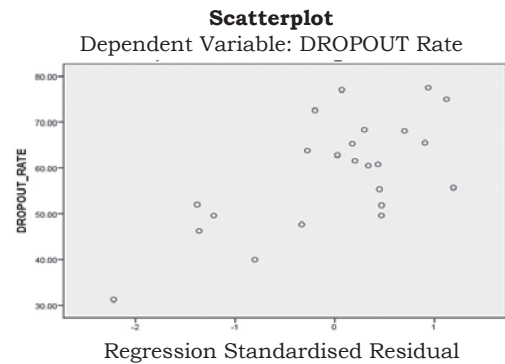
Figure 3. School Level I–X

End Notes

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