DEMAND FOR CHILD SCHOOLING

SYNOPSIS

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SYNOPSIS

DEMAND FOR CHILD SCHOOLING

Introduction and Research Issues:

The 21st century has witnessed momentous changes in the school educational system in India. During the last few years, the government of India has taken imperative steps to achieve the goals of 'Education for all' which lay the foundation for major educational reforms especially in the field of school education. Considering the vital role of elementary education in development, the universalization of elementary schooling in India is one of the most pressing development issues in our country today. The story of India's educational achievements is one of diverse success. India has witnessed remarkable physical progress in the sphere of elementary education as discussed below. The activities under SSA got momentum from the year 2002 onwards and a large number of primary and upper primary schools were started across the country due to the initiatives like DPEP in 1994 and SSA. This was made possible by opening new schools, EGS centres and AIEs. Most states have adopted a variety of bridging interventions such as boarding schools, residential and non-residential schools etc to ensure access. However, the children who live in smaller habitations with very small population continue to face difficulty in accessing schooling facilities within walking distance. These habitations now are being provided with small schools under the Education Guarantee Scheme, known as EGS Centres or alternative schools, which function as a transitory facility till a primary school replaces it. These Centres are opened in habitations having 25 out-of- school children in 6-14 age groups (15 in case of hilly, desert and tribal hamlets). The development made in the provision of schooling facilities

during the last few decades has indisputably been quite remarkable. However, this may not indicate whether the entire population and habitations in India have adequate access to the basic schooling amenities within reasonable distance as prescribed for children of these age groups. Growth of schooling facilities remained generally slow in educationally backward states Assam, Jharkhand, Orissa ,Rajasthan, Madhya Pradesh, Punjab, Uttaranchal and Chhattisgarh. During 2004-05, from 1037813 schools covered from 581 districts across 29 states and union territories, 86.90 percentages of schools were located in rural areas. This reveals further that the percentage share of schools in rural areas remained almost stagnant during the periods. The percentage of rural population to total population of the country is 72.22 percent. Against this there are 87.23 percent of the total schools (1124033) located in rural areas (elementary level). This percentage was 86.90 percent during the previous year. The percentage of Indian habitation being served by Primary and Upper Primary schooling facilities within reasonable distance as prescribed by the norms are **83** percent and **76** percent respectively. While the remote corners of the country is being served with schools, this may not imply that the entire population have been adequately served by basic schooling facilities within reasonable distance as prescribed. In fact, rural habitations not served with schooling facilities is still significant. Thus establishment of schooling facilities in small unserved habitations is still of major concern to the country. Reaching out to the girl child is central to the efforts to universalize elementary education. The targeted provision for girls under SSA include distribution of free textbooks, uniforms and stationary to all girls up to upper primary stage; separate toilets for girls, appointment of female teachers; Early Childhood Care and Education (ECCE) centers near schools in convergence with Integrated Child Development schemes (ICDS), bridge course for older girls, Back-to-school camps for out-of-school girls etc. SSA also addresses the needs of out-of-school children. EGS and AIE help bring out-of-school children into the fold of elementary education. The enrollment in EGS centres reached 41.1 lakh in 2005-06. AIE helps bring specific categories of deprived children such as child labourers, street children, migratory children, older children aged 9 and above back to school. Under this intervention, 28, 09,611 children have been covered during the years 2006-07. However, mere existence of schooling facilities does not certify the participation of children in schooling. This is

clearly explained by the large variations that exist with respect to access to elementary schooling. For instance, though Himachal Pradesh has the highest percentage of population unserved by a primary school within 1 kilometer distance, it is a state with literacy rate much above the national average. In contrast, Bihar has the lowest literacy rate even though less percentage of population is not served by Primary schooling.

A comparative analysis of the states' performances in the sphere of literacy rates are presented as follows. At one hand, proportion of literates was the highest in Kerala. Kerala continues its lead in the literacy rate with 90.92 percent. On the other end, it was less than 50 percent in Bihar for the year 2001. That is, Bihar has recorded the lowest literacy rate of 47.53 percent in the country. Despite the improvements in literacy, there continues to be a large gap between the literacy levels of men and women. For India as a whole, the gender gap in literacy levels has been decreasing since 1981. As per 2001 census, 45 districts in the country have a female literacy rate beneath 30 percent. Female literacy rate in Bihar, Rajasthan and Uttar Pradesh is also noticeably lower than that of India where 54.28 percent (2001) of the females are literate. Female illiteracy is more than 50 percent in 253 districts mostly located in Arunachal Pradesh, Bihar, Jharkhand, Madhya Pradesh, Orissa, Rajasthan, Uttar Pradesh and Jammu Kashmir. These districts have 104.62 million female illiterate which account for 54.51 percent of female illiterates in the country. The urban literacy rate (Male and Female inclusive) of all states for the census year 2001 are higher than the rural literacy rates. The gap in rural-urban literacy rates of the states is highest in Bihar (28 percent) and lowest in Kerala (3.15 percent). Seven states bear the burden of two-thirds of the illiterate population in the country. In fact 60 percent of the illiterate population is accounted for by the states of Uttar Pradesh, Bihar, West Bengal, Rajasthan, Madhya Pradesh and Arunachal Pradesh. In terms of absolute number of illiterates in 2001, the top 100 districts are found in 11 states – Arunachal Pradesh, Bihar, Gujarat, Jharkhand, Karnataka, Maharashtra, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. These districts are home to 120.03 million illiterates (around 40 percent of illiterates of the country).

The most important gauge indicating the participation of children in schooling is the enrollment ratio. According to average data available at the national level, the country

has achieved near universal enrolment in most parts as indicated by the Gross Enrolment Ratios (GER). According to Annual Report of MHRD, 2006-07, as many as 2.2 million children were enrolled in the schools by December 2006. As a result of this, GER of 6-14 age groups increased to 108.56 in 2004-05 from 96.30 in 2001-02 at the primary level and to 70.51 from 52.09 at the upper primary level during the same period of time. However, examined against participation of age specific population, there is still a sizeable gap in the Net Enrolment Ratio (NER). Low enrolment ratio is not a problem in all parts of the country. Several states show a NER of more than 80. But, some States such as Bihar, Rajasthan and Uttar Pradesh seem to face a serious problem. The 61st Round NSS data (2004-05) reveals that about 83% males and 77% females of 5-14 years were currently attending educational institutions in rural areas and altogether 80% children of 5-14 years were attending educational institutions in rural areas while around 89% were attending in urban area. In case of urban male and urban female, this proportion is 89% and 87% respectively. According to the same source of data around 82% children of 5-14 years old were currently attending schools. While around 88% male were attending schools, percentage of females attending schools were around 79%. There is a great variation in attendance rates of children across different states. While around 90 percent and more children were attending school in Kerala, Chandigarh, Himachal Pradesh, Maharashtra, Punjab, Tamil Nadu, Chandigarh, the educationally backward States like Rajasthan, Madhya Pradesh, Jharkhand and Uttar Pradesh were having around 75-78% children in school. Bihar with only 65% of children in school is still performing as poor as before. More or less similar situation is prevailing in case of attendance of 6-14 years old female children. Almost all initiatives of the government intend at bridging gender and social gaps in enrolment, retention and learning achievement at the primary stage. Special interventions have been made and strategies have been adopted to include girls, SC/ST children, child labourers, children from minority religious groups, children below poverty line, migratory children and children in the hardest-to-reach groups those who remained excluded from education for ages. These are indeed the children who are at the high risk of dropping out. Despite special provisions in the Constitution to meet the educational requirement of such groups, the situation has remained far from satisfactory. This gets compounded if the children live in rural areas and are females. The tribal girls

in rural areas are in the most disadvantaged position. Added to it is the widespread problem of never-enrolled or out-of-school children in several rural parts of the country. Although, female enrollment has shown a significant increase during the last few years, gender disparity does not seem to have reduced. Girls' enrollment has grown at the Primary stage from 5.4 millions in 1950-51 to 21.3 million in 1970-71 and to 61.1 million in 2004-05 and at the Upper Primary level from 0.5 millions to 3.9 million and to 22.7 million in the corresponding years. Girls' enrollment increased by 2.9 and 5.8 times respectively during the same time periods. The rate of growth of enrollment of girls has been higher than that of boys but gender variations still persist. Gross Enrollment Ratios of the Indian Census 2001 shows that while 90.3 percent of the boys were enrolled in the elementary level, only 72.4 percent of the girls were enrolled. However, in recent years, there has been an improvement in the school attendance of girls with facilitating factors playing a contributory role, more importantly the adult or parental literacy – especially mother's literacy and government policies and initiatives. National Policy of education of girls at the elementary level (NPEGEL) and Kasturba Gandhi Balika Vidyalaya (KGBV). Such efforts by the government have resulted in the participation of girls at all stages of schooling increase steadily through the years. Since 1950-51, the participation of girls in schooling activities has increased in the Primary stage from 28.1 percent in the same year to 46.7 percent in 2004-05. The corresponding increase in the Upper Primary schooling level is from 16.1 percent to 44.4 percent. Girls still account for only 46.7 percent of the enrollment at the Primary stage and 44.4 percent at the Upper Primary stage as on 2004-05. This shows that disparity in school attendance by sex increases with the age of the children. It is also to be noted that though the enrollment of girls has grown at a much faster rate than for boys over the years, the difference continues to be very sharp. Gender Parity index has increased from 0.41 in 1950-51 to 0.95 in 2004-05 at the primary schooling level and from 0.22 to 0.88 at the upper primary stage. GPI is higher at the primary stage than at the upper primary stage of education. This means that gender disparity is higher at the upper primary level than at the primary level of schooling. Also, girl's participation in schooling activities is still below fifty percent at all stages of education. This is because more girls than boys tend to drop out of school at all levels of schooling. In particular, more girls tend to drop out as they move to higher levels of

schooling for reasons cited above. The rates of drop out have decreased from 64.9 percent in 1960-61 to 29 percent in 2004-05 in primary classes. The rate of drop outs which was 78.3 percent in 1960-61 has come down to 50.84 percent in 2004-05 for the upper primary classes. The drop out rates at the primary and middle stages of schooling for girls is 41.9 percent and 57.7 percent respectively and for boys, it is 39.7 percent and 50.3 percent as per census 2001. This implies an improvement in the retention rates of school going children. Though the many states of the country have done well in enrolling more and more children in schools, their inability to retain them has been a problem.

With full enrollment of children aged 6 to 14 years in many states, the key challenge now is to help bring the 7 million or so of the out-of-school children into the system in order to reduce drop out particularly among girls, scheduled caste and scheduled tribe and muslim minority children at the upper primary level, improve attendance, increase transition from primary to middle level of schooling and to eliminate gender disparity at the upper primary level (SSA, 7th Joint Review Mission, State reports, January 21 – February 8, 2008).

In recent years, though the majority States of India has done well in enrolling more children in school, lack of competence by the schools to retain the children has been a unrelenting dilemma. Highest reduction in drop-out seems to have been achieved during the decade 1980-81 to 1990-91, both at primary and upper primary stages. Astoundingly, only a marginal change was recorded during 1990-91 to 2000-01, which, in fact, witnessed extraordinary level of developmental action in the field of elementary education under the banner of DPEP and various schemes under SSA. However, the situation seems to have drastically changed in recent years showing a reduction of 10.54 percentage points to 28.49 per cent in 2004-05 from 39.05 per cent in 2001-02. It is even more impressive for girls as during the same period drop-out rate for girls declined by 15.08 percentage points. Despite the improvement achieved, incidence of high drop out before completion of the primary cycle raises many questions about the quality of school education.

As noted earlier, there has been sizeable change in condition of dropping out of girls including those from SC and ST. While drop-out rate for girls was higher than boys

till the year of 2001-02, the trend got reversed showing lower drop-out rate for girls than for boys in 2004-05; the drop-out rate for girls became 25.42 per cent and for boys it was much higher at 32 per cent. Nevertheless, at the same time drop-out rate among SC and ST girls continued to be higher than that among SC and ST boys. Similarly, drop-out rate of SC/ST girls were also much higher than the drop-out rates of 'all category' girls. Even with substantial reduction in drop-out phenomenon, as mentioned earlier, the situation with respect to SC and ST children is really alarming. Though the situation dramatically improved over two years between 2001-02 and 2003-04, it is still not clear as to why not even two out of three SC children stay to complete five years of schooling. Further, not all of them transit to upper primary stage. Only 4 out of ten children in the corresponding age group are in the upper primary stage.

The thrust of UEE has been on universal access, universal participation, universal retention and universal achievement. There are several gender, regional and caste disparities in the provision of basic schooling. A very large segment of children of the school-going age still remain out-of-school. It is a sad state of affairs that only two-thirds of those who join school complete primary stage of schooling and only half complete upper primary schooling. A significant proportion of children drop out from school before completing the basic schooling level. While basic schooling facilities must be inclusive and accessible to all children, even in states considered to be educationally advanced; girls continue to face discrimination. As a result, girls comprise a major percentage of out-of-school children.

The main objective of this study are

- To study the variation in child school enrollment rates and the factors determining schooling decisions.
- To explore inter-state variation in varied areas of elementary education
- To analyse the impact of public programs such as schooling incentives and subsidies on child schooling
- To analyse gender disparity in the determinants of child school enrollment

<u>Methodology and Hypothesis:</u>

The theoretical approach to most empirical studies of schooling enrollment is drawn from the Human Capital model developed by Schultz (1960,63), Becker (1964), Mincer (1974) and the recent developments in the household demand model based on Household Production framework. The household' preference over gender-specific investment in the human capital of children measured by schooling of male and female children and a composite consumption good is expressed by the utility function. The family is assumed to maximize the utility function subject to the production function for schooling and its income constraints. The reduced form for gender-specific child schooling deduced from the theoretical model is a function of a set of household level variables, a set of community-level variables and public programs.

The empirical model derived from the general household production framework is tested on district-level data source. The school enrollment equation is estimated using OLS method. The gender-specific parameter estimates provides information on the response of the dependant variable, namely child school enrollment for a change in the explanatory variables; educational attainment levels of the adult population, percentage of muslim population, percentage of rural population, percentage of scheduled caste and scheduled tribe population and a few significant schooling incentives and subsidies. This approach is used in many relevant studies. The sex-specific equations are estimated separately for the age groups 5 to 9 and 10 to 14 years respectively.

Based on the household demand theory, the following hypotheses are proposed and tested;

- Demand for child schooling is positively related with parental education
- Public programmes and incentives are expected to reduce the cost of schooling and thus increase school enrollment rates
- Available evidence suggests that there is a gender-specific disparity in the effects of parental and public programme variables.

Database and Estimation:

The data used in the study includes district-level data for 16 major Indian states which includes 445 districts. This data have been compiled from various secondary sources. Data on gross enrollment ratios for each district was computed on the basis of statistics provided by Table C10: Population attending educational institutions by age and sex, Census of India 2001.The study also utilizes the data provided in Table C8: Educational level by age and sex for population aged 7 and above, Census of India 2001 to calculate the educational attainment levels of the adult population aged 15 and above. Variations in child schooling by religious and caste groups, school distance factor in terms of percentage of population residing in the rural areas of the districts was based on the statistics provided by the Primary Census Abstract of India, 2001. Statistical database for the study of impact of public provisioning on child schooling has been compiled from District Primary Education Program [DPEP]'s District Report Cards 2004.

Major Findings of the study:

Primary and middle educational levels of adult population influences positively and significantly at 5 percent level showing that a one percent increase in the specified level increases gross enrollment of primary and upper primary school children by 0.52 and 0.64 percent respectively. Also, the estimate associated with percentage of adult population having attained above secondary level on an average increases primary and upper primary gross enrollment by 0.28 and 0.33 percentages respectively. A one percent increase in the percent of rural population residing in the sample districts significantly reduces primary schooling by 36 percentage points and upper primary enrollment by 26 percentages. An increase in the muslim population by one percentage point significantly reduces the schooling of total children enrolled at the primary level by 0.39 and upper primary level by 0.41 percentage. The percentage of scheduled caste and scheduled tribe population has no statistically significant linear influence on the primary schooling of children.

Objectives and hypothesis:

The overall objective of this study is

- ❖ To study household determinants influencing child school enrollment.
- ❖ To explore inter-state variation in varied areas of elementary education
- ❖ To analyse the impact of public programs such as schooling incentives and subsidies on child schooling
- ❖ To analyse gender disparity in the determinants of child school enrollment

For this purpose, three specific hypotheses are tested for significance.

- ❖ Parents' or adult education levels is considered to have a positive impact on household decisions on enrollment of school children in the primary and upper primary stages.
- ❖ Participations levels of school children respond significantly to selected interventions of the government.
- ❖ School enrollment is significantly influence by social and cultural factors.

Econometric framework and Estimation Method:

The theoretical approach to most empirical studies of schooling enrollment is drawn from the inspiration of the Human Capital model developed by Schultz (1960,1963), Becker (1964) and Mincer (1974).

The main focus of the study is on the determinants of demand of child school enrollment based on the household demand framework Becker (1965), Rosenzweig and Evenson (1977), Duraisamy (2001) and several others. Assuming a linear relation, the estimating equations of the demand for child schooling can be specified as:

$S = b_o + b_1 H + b_2 C + b_3 PP + U$

Where S is the dependant variable namely child school enrollment, H is a set of household characteristics, C is a set of community level variables, PP is a set of specific public program variables, U is the random disturbance term, b's are a set of parameters to be estimated.

The strategy followed in estimating the demand equation depends upon the assumption about the disturbance term. It U is assumed to be normally distributed with

zero mean, constant variance and is also assumed to be normally distributed with the exogenous variables, and then the demand equation may be estimated by OLS method separately for the two stages of schooling. Six specifications of child school enrollment are as follows. The first is a basic specification including the percentage of male and female adults with 'primary and middle' and 'above secondary' level of educational attainment. This serves as proxy for parental education. The second specification includes the socio-cultural characteristics of the population in the districts. Joint effects of parental educational levels and community level characteristics of the sample districts are analyzed in the third specification. Specification 4 measures the impact of public programs on child schooling. Linear combinations of a few or all of the same set of determinants on school enrollment is specified in 5, 6 and 7.

Methodology and database:

This research study presents an analysis of the determinants of child school enrollment in 20 major states of India, based on Household production framework as suggested by Becker and others. This framework provides the means for interpreting empirical findings on the relation between school participation on one hand and household and other characteristics on the other. School participation especially among children aged 5 to 9 and 10 to 14 years (primary and upper primary stages respectively) respond to a wide range of variables such as: educational attainment levels of adult population, percentage of muslim, scheduled castes and tribes population, rurality of the district and schooling subsidies like proportion of uniforms, textbooks, school development and teaching material grants received by the school and student beneficiaries from the sample districts. This study is carried out using the Ordinary Least Squares Method.

Measures of child schooling

Review of related empirical studies show that the index being used for analyzing child schooling is the gross enrollment rates. Child schooling is examined at two levels: Primary level of schooling which includes classes I to V and Upper Primary or Middle level of schooling (Classes VI to VIII). The corresponding age group for these stages is 5 to 9 years and 10 to 14 years of age respectively. Gross enrollment rates were computed

on the basis of data furnished by Table C10: Population attending educational institutions (Schools) by age and sex, Census of India, 2001.

Exogenous variables: Household characteristics

This includes the educational attainment levels of adults (Parents). Parental education is an important factor influencing the schooling of children. Thus, the efficiency of the parents in the production of the schooling of children is measured by the number of years of schooling of male and female adults, aged 15 and above, with "Primary and Middle' and "Above Secondary' levels of education. Table C8: Educational level by age and sex for population aged 7 and above of the Census of India, 2001 formed the data base.

Exogenous variables: Community-level variables

The factors facilitating or deterring indicators of child schooling are examined by considering the variations arising due to different caste groups, religion and access to schools. Accordingly, the percentage of rural population in the districts, percentage of scheduled caste and tribes' population and percentage of muslim community are included for the study. The Primary Census Abstract of India, 2001 formed the data base.

Exogenous variables: Public program variables

Public programs are expected to affect the demand for child schooling. For instance, free provision of uniforms, text books etc by reducing the costs of schooling drastically improves the school attendance rates of school children. Also, provision of teaching-learning material grants, school development grants etc. are expected to enhance the quality of infrastructure and schooling facilities. A number of public program variables such as percentage of primary and upper primary schools provided with development and teaching-aids grants and the proportion of students benefited from free provision of text books, uniforms, stationary etc., were included for the study. District Report Cards (2004-05) compiled by the District Primary Education Program, MHRD constituted the basis for compilation of data in this respect.

IV. Economics of Fertility and Investments in Children in Developing Countries

John Strauss and Duncan Thomas, ''Human Resources: Empirical Modeling of Household and Family Decisions,'' in T.N. Srinivasan and Jere R. Behrman, editor, Handbook of Development Economics, Volume 3, 1995.

T. Paul Schultz, ''Demand for Children in Low Income Countries,'' forthcoming in Handbook of Population and Family Economics.

*Mark R. Rosenzweig, ''Population Growth and Human Capital Investments: Theory and Evidence,'' Journal of Political Economy, 1990, 98(5), part 2, S38--S70.

*David Lam and Suzanne Duryea, ''Effects of Schooling on Fertility, Labor Supply, and Investments in Children, with Evidence from Brazil,'' University of Michigan Working Paper, September 1996.

10. T. W. Schultz, "Investment in Human Capital," *American Economic Review,* 51:1-19, March 1961.

Dependant variable: Child school enrollment ratio (Age group 5 to 9)						
Variable	Expected years of schooling of boys	Expected years of schooling of girls	Expected years of schooling of boys	Expected years of schooling of girls	Expected years of schooling of boys	Expected years of schooling of girls
	Col.1	Col.2	Col.3	Col.4	Col.5	Col.6
Constant	54.17	48.55	56.81	51.31	41.27	34.57
	(13.158)	(9.905)	(40.245)	(30.84)	(9.664)	(7.442)
Adult education						
'Primary & middle' Level: Male	0.073	-0.062			0.147	0.010
	(1.475)	(-1.352)			(3.249)	(0.253)
'Primary & middle' Level: Female	0.514	0.720			0.316	0.519
	(7.682)	(11.591)			(5.064)	(9.081)
'Secondary & above' level: Male	-0.131	-0.104			-0.018	0.005
	(-2.100)	(-1.796)			(-0.337)	(0.104)
'Secondary & above' level: Female	0.143	0.083			0.119	0.062
	(1.824)	(1.142)			(1.743)	(0.993)
Socio-cultural characteristics						
% Muslim population	-0.335	-0.273			-0.227	-0.167
	(-9.409)	(-8.246)			(-6.914)	(-5.534)
% Rural population	-1.204	-0.185			-0.111	-0.093
	(-4.984)	(-4.887)			(-2.830)	(-2.591)
% SC/ST population	0.027	0.025			0.003	-0.003
	(0.726)	(0.723)			(0.096)	(-0.089)
Public program variables (Primary level)						
SDG			0.005 (0.094)	0.059 (1.137)	0.024 (0.578)	0.022 (0.578)
TLM			0.342 (6.217)	0.303 (5.536)	0.203 (4.935)	0.185 (4.907)
Text book – boys			0.426 (5.128)	0.360 (4.345)	0.390 (6.189)	0.356 (6.159)
Text book – girls			-0.726 (-9.193)	-0.686 (-8.734)	-0.400 (-6.341)	-0.393 (-6.794)
Uniform – boys			0.191 (4.769)	0.188 (4.737)	0.171 (5.449)	0.165 (5.725)
Uniform – girls			0.004 (0.091)	0.062 (1.344)	-0.087 (-2.410)	-0.058 (-1.762)
R square	**0.59**	**0.65**	**0.45**	**0.46**	**0.71**	**0.76**
F	**94.11**	**119.41**	**61.88**	**63.47**	**85.01**	**107.23**
No. of districts	**445**	**445**	**445**	**445**	**445**	**445**

Notes: Computed from secondary survey reports

't' values in parenthesis

Dependant variable: Child school enrollment ratio (Age group 10 to 14)						
Variable	Expected years of schooling of boys	Expected years of schooling of girls	Expected years of schooling of boys	Expected years of schooling of girls	Expected years of schooling of boys	Expected years of schooling of girls
	Col.1	Col.2	Col.3	Col.4	Col.5	Col.6
Constant	38.60	21.31	77.27	62.157	34.03	14.56
	(12.683)	(5.542)	(78.697)	(45.544)	(10.36)	(3.485)
Adult education						
'Primary & middle' Level: Male	0.503	0.093			0.559	0.158
	(12.841)	(2.682)			(13.128)	(4.181)
'Primary & middle' Level: Female	0.157	0.675			0.074	0.591
	(2.973)	(14.427)			(1.296)	(11.648)
'Secondary & above' level: Male	0.455	0.305			0.463	0.313
	(9.244)	(7.024)			(9.508)	(7.237)
'Secondary & above' level: Female	-0.149	-0.082			-0.120	-0.038
	(-2.403)	(-1.503)			(-1.878)	(-0.672)
Socio-cultural characteristics						
% Muslim population	-0.257	-0.117			-0.256	-0.100
	(-9.128)	(-4.686)			(-8.919)	(-3.918)
% Rural population	-0.047	-0.036			-0.011	0.002
	(-1.459)	(-1.265)			(-0.318)	(0.050)
% SC/ST population	0.017	0.061			0.028	0.061
	(0.573)	(2.384)			(0.993)	(2.392)
Public program variables (Primary level)						
SDG			-0.119 (-1.964)	-0.028 (-0.473)	-0.076 (-2.247)	-0.050 (-1.645)
TLM			0.386 (6.519)	0.382 (6.633)	0.082 (2.517)	0.061 (2.113)
Text book – boys			-0.379 (-2.843)	-0.010 (-0.073)	-0.028 (-0.370)	0.155 (2.311)
Text book – girls			0.354 (2.932)	0.220 (1.870)	0.163 (2.419)	-0.080 (-1.343)
Uniform – boys			0.538 (1.177)	0.694 (1.561)	-0.023 (-0.093)	0.062 (0.287)
Uniform – girls			-0.519 (-1.165)	-0.832 (-1.916)	-0.011 (-0.048)	-0.055 (-0.258)
R square	**0.75**	**0.80**	**0.12**	**0.16**	**0.76**	**0.81**
F	**187.61**	**257.92**	**10.97**	**15.47**	**108.37**	**146.05**
No. of districts	**445**	**445**	**445**	**445**	**445**	**445**

Notes: Computed from secondary survey reports

't' values in parenthesis

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Orientation Programme for newly recruited teachers of Government Arts and Science Colleges

An introduction to Data Analysis:
Statistical Package for Social Sciences [SPSS]

By
J. Regi Manimegala
Senior Lecturer

October 22, 2008

TYPES OF DATA:

- ❖ Interval – Discrete of Continuous data
- ❖ Ordinal – Ranked data
- ❖ Nominal – Frequency data

STATISTICAL TOOLS:

- ❖ Descriptive statistics – Mean, median, mode, skewness, kurtosis, standard deviation, variance….
- ❖ Univariate and bi-variate frequency distributions [Recoding of data]
- ❖ Correlation and regression analysis [Hypothesis-testing,Standard error, incremental or marginal contribution, Step-wise regression, dummy variables]
- ❖ Analysis of variance(ANOVA): One-way, Two-way, Multi-variate ANOVA (MANOVA)
- ❖ Fisher's 't' test [Independent samples, Dependant/Paired samples]
- ❖ Diagrammatic presentation of data.

1. Estimate the cobb-douglas production function for the Mexican economy. Interpret.

Year	1955	1956	1957	1958	1959	1960	1961	1962
GDP	114043	120410	129187	134705	139960	150511	157897	165286
Employment	8310	8529	8738	8952	9171	9569	9527	9662
Fixed Capital	182113	193749	205192	215130	225021	237026	248897	260661
Year	1963	1964	1965	1966	1967	1968	1969	1970
GDP	178491	199457	212323	226977	241194	260881	277498	296530
Employment	10334	10981	11746	11521	11540	12066	12297	12955
Fixed Capital	275466	295378	315715	337642	363599	391847	422382	455049
Year	1971	1972	1973	1974				
GDP	306712	329030	354057	374977				
Employment	13338	13738	15924	14154				
Fixed Capital	484677	520553	561531	609825				

2. The following is a cross-sectional data on child mortality (CM) and per capita GNP in 1980. What is the expected relation between CM and GNP? Estimate the functional relationship between them. Interpret the slope and the intercept coefficients.

CM	128	204	202	197	96	209	170	240	241	55
GNP	1870	130	310	570	2050	200	670	300	120	290
CM	75	129	24	165	94	96	148	98	161	118
GNP	1180	900	1730	1150	1160	1270	580	660	420	1080
CM	269	189	126	12	167	135	107	72	128	27
GNP	290	270	560	4240	240	430	3020	1420	420	1983
CM	152	224								
GNP	420	530								

1.

Year	Q('000 yards)	P ($/yard)
1970	8	2
1971	3	4
1972	4	3
1973	7	1
1974	8	3
1975	0	5

Estimate the average elasticity of demand.
Forecast the level of demand if price rise to $6

2.

Persons	Consumption	Income
1	15600	16300
2	6400	6800
3	9200	8600
4	14900	15300
5	7200	8700
6	7600	7800
7	7200	7300
8	7200	8300
9	7900	9400
10	8800	10800
11	15400	18600
12	4100	5100
13	11100	11600
14	2400	2700
15	11500	11800
16	4200	4600
17	6700	5400
18	12100	12900
19	11100	13300
20	4700	5900

Estimate the consumption and savings function using this cross-section data.

What is the MPC and MPS value. Test the statistical significance of the individual coefficients at 5% level.

Forecast the level of consumption at the mean income.

Forecast the level of savings for an individual whose income is $20000.

What percentage of the total variation in C and S is explained by income alone.

Use a similar tool to analyse the following data

Promotion	Unit sales for 5 stores
Free-sample	78 87 81 89 85
One-pack gifts	94 91 87 90 88
Cents off	73 78 69 83 76
Refund by mail	79 83 78 69 81