Do Schools Equalise Academic Achievements to Overcome Socio-economic Differences: A Study of Determinants of School Leaving Examination Marks in Tamil Nadu

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Abstract

School education should provide an environment for inclusiveness. Understanding the backwardness of certain communities is as important as appreciating and nurturing intelligence and excellence. This is the surest route to render social justice and to establish an egalitarian society. When education is conceived as a form of human capital, then distribution of this human capital should be equal across society. Rather distribution of human capital should help to overcome the other social and economic backwardness of children in the depressed communities.

When society is stratified by communities, so are the schools to cater to different needs of the each stratum of the society. Hence, community, type of schools, location, gender, choice of subjects are inter-related and together determine the creation of human capital as measured by marks. Hence, we attempt at analysing the determinants of marks using data of nearly 3.9 lakh students who successfully completed 10th standard in 2008 and proceeded to complete 12th standard in 2010. With this large data set, we could find a clear trend of students from relatively forward communities, study in self-financing schools and choose subjects that take them to professional courses in higher education, ultimately scoring higher grades than others. On the contrary, the students from the backward and depressed communities, study in government schools, choosing subjects that do not take them to professional education and they also score very low marks. Thus, the existing school system creates further inequality through unequal distribution of human capital.

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Introduction

Literature on learning outcomes of students emphasises that there are identifiable factors that influence the test scores as a measure of learning outcomes. Family background, captured in terms of communities, parental education and employment, family income, etc., could influence choice of school and subjects of study. Irrespective of family background, school has a definite role to improve learning outcomes of students. In Indian context the language of learning also has a greater influence on learning outcomes.

Of late, the school education is being seen as an important human capital investment by both parents and the government. When marks at the school leaving exams determine the entry to 'job-oriented' courses and institutions of excellence, marks evolve in today's context as the ultimate measure of learning outcomes, acceptable to all. In spite of its intermediate character and that the actual purpose of school education is not to enable entry into higher education, but to instil values of culture, citizenship, literacy, numeracy and laying foundations for life long, marks and pass percentage are deemed as the indicators of quality of school as much as it is supposed to reveal the scholastic abilities of students. Notwithstanding the fact that the grades/marks scored in the government conducted school leaving examinations are standardised, marks do influence the schools and teachers to teach only those that are tested in such examinations and leave the rest for the students to discover themselves. Moreover, such examinations are only partial measurements of learning outcomes.

Yet, it is interesting to examine the role of social, school and other factors that determine the level of learning outcomes of students as reflected in marks. When human capital investment decisions are made by parents, family background does influence choice of school and learning outcomes. As parents strive to provide opportunities for their children to gain social and economic upward mobility through choice of school and subjects of study, ironically, it is also the basis for further socio-economic divergence in the next generation, as families forge intergenerational links in education and wealth. In this context, the growth of private schools, which are perceived to be more efficient than government schools in training the students to score more in the terminal examinations, reflect the preference of parents in this regard. The private schools have less number of students per class and more resources per

student, hence expected to provide better learning experience for the students. But the choice of private schools also reflect the economic and educational background of the parents, hence the home environment also should be conducive for such educational experience.

Though school is expected to be a social equaliser or at least to narrow the educational gap between students of different socio-economic strata, when we have different types of schools that roughly reflect the stratified society, then schools are surely institutions for exacerbating the social and economic divisions in the society. Tamil Nadu is an ideal state to explore how differences in schools could sharpen the divisions in the society through widening the learning outcomes of students of different communities. Till recent times, the State Government had different types of School Boards, which when combined with the differences in the management of schools we had several types of schools that cater to different sections of the highly stratified Tamil society. Though for the sake of analytical convenience we have aggregated schools in terms of two main boards and four main types of management, we could find the sharp differences in the segregation of students by communities overlap on the types of schools. Thus community through selection of schools and subjects of specialisation could influence the learning outcome of students. Given these factors, the variation in the learning outcomes of students should be explained by variation in a host of factors such as family background, school characteristics, location, gender and choice of subjects.

Review of Literature

Robert (1980) in a path breaking paper highlighted the dynamics of social background and schooling process. The main thesis that Mare had put forth was that the social background has a definitive role in continuation of education and through this it affects the ultimate educational outcomes. This study showed that there was a positive association between parental income, job and education with that of movement of students to higher levels of school education and then to the college, there after this effect was less or insignificant. Therefore, the study strongly concludes, 'parental encouragement may mostly strongly affect continuation decisions at the higher levels of schooling' and 'the socio-psychological benefits of higher socio-economic origins are most important at the highest schooling levels, while economic

benefits afford greater advantages for grade progression in the pre-college years'. Of course, Mare's analysis camouflages the role of students' innate ability and self determination to score more and move up in the education ladder. Cameron and Heckman (1998) using a sophisticated econometric modelling, proved that without accounting for the human ability, we would be over-estimating the effects of family background on educational transition and hence would misallocate resources among the students without innate ability to attain higher educational levels. Therefore, the innate ability of a student is a unobserved character in such studies.

Nevertheless, there have been attempts to show the causal effects of social and family characteristics on the educational attainments of students. Ermisch and Macro (2001), have studied the causal effect of family structure and parental education on students' educational attainment. They could show this causal effect being stronger in poor families. Valbuena (2011) investigated the impact of parental education on children's education. This study was based on the British Household Panel Survey, which was started in 1991. The 13th Wave (round of data) was collected in 2003-04. This survey gave longitudinal data over 13 years. Though the sample had 5500 households, excluding some of the respondents for inconsistency in data, the researcher has taken 3046 sample respondents. The analysis has shown the positive impact of parental education on children's education, and particularly the mother's post compulsory education had significant positive impact on children's college education. Family income and parental higher education had higher relevance for the greater educational attainment of children. Thus this study comes out with a significant finding of the growing educational gap in the society.

Bhaumik and Charkaborthy (2010) have taken an interesting question in Indian context, that is, how the probability of transition from lower to higher levels of education is affected by social and family characteristics, based on the sample data collected by the National Sample Survey Organisation in 2005. Probabilities of three transitions over four educational levels – primary, middle, higher secondary and tertiary education are estimated. Personal and household characteristics are captured in terms of gender, household per capital consumption (a proxy for economic status) and education of the head of household. The economic and educational characteristics of the regions are captured in terms

of per capita GDP, share of agriculture to state GDP, literacy rate of the state, percentage of public expenditure on education and rural-urban character of household. Generally women have lesser probability to get into higher education, so too Muslims and people from rural areas. The students in states with higher level of literacy, higher percentage of public expenditure on education, have positive impact of successive transitions to higher levels of education.

Though time and again, studies have highlighted that social and family background of students does influence their educational attainment, there are a few shortcomings in such studies. The primary among them is the failure to include the innate ability of students. There have been psychological studies in this respect, but all the other studies have failed to distinguish between nurtured talents from the natural talents of students.

One another important aspect of these sociological and economic analyses is the influence of school characteristics and peer group pressure. Smaller class size, a proxy for higher resources per students and better concentration of teachers on individual student's needs is expected to increase the educational attainments. Researchers continue to study this aspect of educational attainment. Similarly, girls score more marks than boys, ceteris paribus. So presence of girls in the classroom is expected to increase the peer group pressure on boys and thus increases their educational attainments. A randomised experiment was conducted by Whitmore (2005) to find the impact of class size and presence of girls on the educational attainments of both boys and girls. While smaller class size at the lower levels of education has little impact on boys and girls, but it is quite likely to improve their educational attainment at the higher standards. Greater the presence of girls in the kindergarten, greater was the effect on both boys and girls in the higher classes. This study concludes that on the whole, smaller class size and greater presence of girls have positive impact on both boys and girls in higher classes.

We have conflicting evidence about the impact of all the school input factors on the educational attainment of students. This trend sustains the continued research interest in exploring the determinants of students' educational attainments; particularly, it is essential to design school system and justify state intervention for rendering social justice.

Research Issue

Whether the social background as reflected in the community and type of schools do explain the differences in learning outcomes as measured by marks in the school leaving examinations is the main question this paper tries to address. Capturing the intended learning outcomes through a single examination system is difficult. Nevertheless, the examination systems that are common to all types of schools and students provide marks as the measure of learning outcomes, to compare the relative academic achievements of students. The community – a broad indicator of socio-economic background of students, determines, on one hand, the choice of schools and the subjects they opt for in the higher secondary course, and on the other hand, the learning outcomes, in terms of marks in the terminal examinations. We test the determinants of learning outcomes of a set of 10th standard students and their learning outcomes in 12th standard, two year later. The gender and the location, along with the type of schools, are also important determinants of learning outcomes, which are included in this study.

The Database

We have taken two sets of data from the Dept of Government Examinations, Govt of Tamil Nadu, namely, the database of students who appeared for the 10th standard examination in April, 2008 and the database of students who appeared for the 12th standard examination in March, 2010. One of the authors analysed the results of the 12th standard in an earlier work (Srinivasan, and Karpagam, 2012), and the present work is to analyse the academic performances of the set of students who successfully completed 10th standard in 2008 and appeared for 12th standard examinations in 2010. We have matched the database of 12th standard with that of the 10th standard and identified students with reference to name, date of birth, sex and community. If all the four characteristics are similar in the two data sets for a student, then we conclude that the same student appeared for 10th standard in 2008 and for 12th standard in 2010. Thereafter, the marks, school and subjects are amalgamated to get a unified database of 10th and 12th marks for each student. Accordingly, we could get 3,88,889 students records containing marks, school characteristics, subjects in both 10th and 12th standard and community and other social indicators. This is the database for our study.

The Broad Picture

We are not analysing all the students who appeared for these two examinations, hence the broad picture is only a description of the subset of students who are in our database. The Table 1 given below shows that the girl-boy ratio in our database is 52:48. All the students who successfully completed the 10th standard in 2008 have appeared through recognised schools and have passed this examination in the first attempt. Out of these 3,88,889 students, only 86.6 per cent passed the 12th standard examination in 2010 and this is a little higher than the overall pass percentage of 85.3 per cent in that year for the 12th standard. In line with the trend set over the years, the pass percentage was higher for girls than for boys.

It is worthy of noting the sharp change in the rural-urban composition of students between 10th and 12th standard. The 59 per cent of the students who passed 10th standard was from rural areas and only 41 per cent was from urban areas. On the contrary a majority of the rural students have chosen to go to urban schools for higher secondary, hence we find only 49 per cent of the 12th standard students appeared from the rural schools and the rest 51 per cent appeared from the urban schools. We do find the location of schools does influence the probability of securing higher marks in the terminal examinations. Generally, students from urban areas perform better than their rural counterparts. In 2010, if we consider the total population of 12th standard students, the pass percentage in urban areas was 85.6 compared to 80.7 in rural areas. But in our sample, the pass percentage in urban areas was only slightly higher at 84.15 compared to 84.97 in rural areas. Hence, it is obvious, more students prefer urban schools to rural schools.

The distribution of students in terms of communities was more or less same as in the distribution of the students in the total population. What is important is the distribution of the students in the subject groups in 12th standard. We find nearly 65 per cent and 23 per cent of the students have chosen to study Science and Commerce subjects and the rest 12 per cent of the students are distributed between Arts and Vocational courses. The science groups give the students the base to pursue technical higher education, hence the larger proportion of students in these groups. Next the students prefer the commerce groups because they offer the base to choose commerce and related courses in colleges. We

find a higher proportion of the students in vocational courses, because such courses are provided mainly in government schools and a very insignificant number of government-aided and private schools offer these courses. The government technical schools that offer the vocational courses try to fill the intake capacity so as to engage the specialised teachers who are appointed to teach such courses. The vocational stream also offers the largest variety of courses and hence could accommodate larger number of students.

Finally, we take a look at the distribution of students by types of schools. We have combined all types of government schools, those run by the state departments of Education, SC&ST Welfare, Social Welfare, Minorities Welfare and Forest, and those of the Municipalities and Cantonment Boards. There is extreme variation in terms of social background of students, infrastructure and learning outcomes in each of the different type of government schools, but because of inadequacy of data in each of these institutions, we have combined them under the head 'Government Schools'. Next, we have the government-aided schools. The state government during various years have extended financial help to schools that have been established by philanthropists, social groups and linguistic and religious groups. These schools are perceived to serve the society at large; hence the state government has been providing recurring grants to meet the salary expenses on teaching and non-teaching staff in these schools. These government-aided schools are privately managed but partially government funded, hence, they do not fix higher tuition fees, consequently, we find students from lower middle class also study in these schools. Generally, the tuition fees in the self-financing SSLC schools are lower than in the Matriculation schools, hence we have divided the private schools into self-financing SSLC schools and Matriculation schools.

Table 1: Summary Statistics of 10th standard and 12th standard Students

S.No	Particulars	10th standard	12th standard
1	Total No of Observations	3,88,889	3,88,889
1A	Girls	2,02,715 (52.13)	
1B	Boys	1,86,174 (47.87)	
2A	Pass	3,88,889	3,36,570 (86.55)

2B	Fail	-	52,319 (13.45)
2B1	Fail Girls		21,796 (10.75)
2B2	Fail Boys		30,523 (16.39)
3A	Rural	2,30,131 (59.18)	1,89,873 (48.82)
3B	Urban	1,58,758 (40.82)	1,99,016 (51.18)
4A	OC	19,839 (5.10)	
4B	BC	1,75,396 (45.10)	
4C	MBC	1,01,332 (26.06)	
4D	SC&ST	92,322 (23.74)	
5A	Group in 12 Std - Sciences		2,50,958 (64.53)
5B	Group in 12 Std - Commerce		88,402 (22.73)
5C	Group in 12 Std – Other Arts and Humanities		6,939 (1.78)
5D	Group in 12 Std - Vocational		42,590 (10.95)
6A	Government Schools	1,83,937 (47.30)	1,76,586 (45.41)
6B	Govt aided Schools	1,30,196 (33.48)	1,18,063 (30.36)
6C	Self financing SSLC Schools	10,115 (2.60)	32,528 (8.36)
6D	Matriculation School	64,641 (16.62)	61,712 (15.87)

When we compare the distribution of students among these four groups of schools, we find a concrete shift of students from all the groups towards self-financing SSLC schools, because, the intake capacity in higher secondary classes was less than the intake in 10th standard in all the schools except self-financing SSLC schools. In Table 2, we give a cross tabulation of students in these four groups of schools in both 10th and 12th standards. On the whole nearly 78 per cent of students studied both 10th and

12th standards in the same type of school and only 22 per cent shifted schools for the higher secondary. A higher percentage of students shifted from government to government-aided schools, and as a reverse process, we find 13.28 per cent of students from government-aided schools shifted to government schools for higher secondary, followed by self-financing SSLC and Matriculation schools. Nearly 24 per cent of students from self-financing SSLC schools shifted to government-aided schools followed by government and Matriculation schools for higher secondary. Next to government schools, the Matriculation schools retained the largest proportion of their Matriculation students in the higher secondary classes, and 13 per cent of them shifted to self-financing SSLC schools followed by government-aided and government schools. By and large, the students have moved to urban schools and self-financing and partially government funded schools.

Table 2: Cross Tabulations of students by Type of Schools in 10th and 12th Standards

Class	12 Standard				
10 standard	***Type of School***	***Govt***	***Aided***	***Self Financing SSLC***	***Matriculation***
	Govt	1,55,685 (84.64)	16,416 (8.29)	7,030 (3.82)	4,806 (2.61)
	Aided	17,289 (13.28)	93,929 (72.14)	12,876 (9.89)	6,102 (4.69)
	Self Financing SSLC	1,499 (14.82)	2,390 (23.63)	4,747 (46.93)	1,479 (14.62)
	Matriculation	2,113 (3.27)	5,328 (8.24)	7,875 (12.81)	49,325 (76.31)

Note: Figures in Parentheses are percentage to 10th standard total in each type of school.

Association between Marks and Social and School Characteristics

The data set has, apart from marks obtained in each of the subjects by 3,88,889 students in both 10th and 12th standards, each student's community, sex, date of birth, type of school, location and subjects studied in higher secondary. We have already seen the distribution of students by these parameters. In this section, we analyse the determinants of marks obtained in the 10th and 12th standard examinations. Initially, we described the distribution

of aggregate marks obtained in 10th standard over the social and school parameters that we have listed above.

Table 3 given below, shows the distribution of students by marks and sex in 10th and 12th standards. As percentage of marks increases in both the classes, the proportion of girls increases. The proportion of girls scoring more than 60 per cent in the 10th and 12th standard examinations are 54 per cent and 55 per cent respectively. Thus, girls not only show higher pass percentage than boys, they score over the boys in higher grades as well.

Table 3: Distribution of Students by Marks and Sex

Class	**10th Standard**			**12th Standard**		
Marks	***Girls***	***Boys***	***Total***	***Girls***	***Boys***	***Total***
≤34.9%	0	0	0	21,796 (42)	30,523 (58)	52,319
35%-49.9%	24,469 (46)	28,940 (54)	53,409	12,551 (46)	14,617 (54)	27,168
50%-59.9%	37,398 (49)	38,897 (51)	76,295	40,866 (52)	37,811 (48)	78,677
60%-74.9%	62,518 (51)	59,041 (49)	1,21,559	72,982 (54)	61,201 (46)	1,34,183
≥75%	78,330 (57)	59,296 (43)	1,37,626	54,520 (56)	42,022 (44)	96,542

Note: Figures in parentheses are percentage to respective class total in each row.

We have already seen that there was a sharp shift of students from rural schools to urban schools for the higher secondary. The rural-urban ratio was 59:41 in 10th standard and it has become almost on par in 12th standard, that is, 51:49. This is reflected in each of the grades in the 10th and 12th standards. Though, the overall proportion of urban students was 41% in 10th standard, their share increases as we move from the lower marks to higher marks, that is the percentage of urban students was only 29 in the grade 35 per cent to 49.9 per cent, and the proportion increased to 49 in the grade 'greater than 75 per cent' as shown in Table 4 given below. In the case of 12th standard, the students are almost equally divided between rural and urban schools, so is the distribution in the higher grades. But we find relatively larger proportions of urban students in the lower grades. Therefore, location does not make any difference in terms of grades, at the aggregate level, but it could make some difference for the science and commerce groups, because the urban centres have more private coaching centres in these subjects compared to rural areas.

Table 4: Distribution of Students by Marks and Location

Class	10th Standard			12th Standard		
Marks	***Urban***	***Rural***	***Total***	***Urban***	***Rural***	***Total***
≤34.9%	0	0	0	27,571(53)	24,748(47)	52,319
35%-49.9%	15,491(29)	37,918(71)	53,409	14,844(55)	12,324(45)	27,168
50%-59.9%	26,514(35)	49,781(65)	76,295	41,751(53)	36,926(47)	78,677
60%-74.9%	49,620(41)	71,939(59)	1,21,559	67,581(50)	66,602(50)	1,34,183
≥75%	67,133(49)	70,493(51)	1,37,626	47,269(49)	49,273(51)	96,542

Note: Figures in parentheses are percentage to respective class total in each row.

Table 5 shows the association between type of schools and grades in 10th and 12th examinations. In both the classes, we find the private schools have higher proportions of students in higher grades and the government and government-aided schools have higher proportions of students in the lower grades. This could mean that the students from economically and educationally backward communities study in government and government-aided schools and score lower marks compared to the students in the private schools.

Table 5: Distribution of Students by Marks and Types of Schools

Class	10th Standard			
Marks	***Govt***	***Aided***	***Self fin SSLC***	***Matric***
≤34.9%	0	0	0	0
35%-49.9%	40100(22)	12219(9)	506(5)	584(1)
50%-59.9%	46584(25)	22980(18)	1322(13)	5409(8)
60%-74.9%	55444(30)	41852(32)	3161(31)	21102(33)
≥75%	41809(23)	53145(41)	5126(51)	37546(58)
Total	183937	130196	10115	64641
Class	**12th Standard**			
Marks	***Govt***	***Aided***	***Self fin SSLC***	***Matric***
≤34.9%	38748(22)	9870(8)	1559(5)	2102(3)
35%-49.9%	20669(12)	5129(4)	756(2)	604(1)
50%-59.9%	46530(26)	22372(19)	4421(14)	5292(9)
60%-74.9%	54353(31)	49066(42)	11373(35)	19219(31)
≥75%	16286(9)	31068(26)	14419(44)	34495(56)
Total	176586	118063	32528	61712

Note: Figures in parentheses are percentage to respective class total in each column.

If the communities reflect the relative positions of educational and economic backwardness of people, then, we could expect higher proportions of students from forward communities should be in higher grades compared to the students from backward and oppressed communities. In Table 6, look at the grade '≥75 per cent' in both 10th and 12th standard examinations, the proportion of students decline as we move from the forward community OC to the most oppressed communities SC & ST, whereas it is the reverse in all other lower grades.

From Table 6, we could infer that the distribution of students by marks and community has a certain pattern. Compare the rows 35 per cent to 49.9 per cent with ≥75 per cent, as we move from OC to SC & ST, we find the proportion of students increases in the former row and declines in the latter row. Academic achievement distance between the OC and SC & ST can be highlighted using the following facts. One, the proportion of OC students scored more than 75 per cent was 57 in 10th standard and 53 in 12th standard, whereas for the SC & ST students they are 21 and 12 respectively. Similarly, we compare the proportion of students scoring less than 49.9 per cent, and find that the ratios for two classes in OC are 4 and 8, for SC & ST they are 22 and 32. Thus, higher proportion of OC students score more than 75 per cent and higher proportion of SC and ST students score less than 49.9 per cent in both the classes, widening the academic distance between the two communities in successive levels of education.

Table 6: Distribution of Students by Marks and Community

Class	**10th Standard**			
Marks	***OC***	***BC***	***MBC***	***SC&ST***
≤34.9%	0	0	0	0
35%-49.9%	817(4)	15834(9)	16021(16)	20737(22)
50%-59.9%	2113(11)	28423(16)	21792(22)	23967(26)
60%-74.9%	5682(29)	55333(32)	32375(32)	28169(31)
≥75%	11227(57)	75806(43)	31144(31)	19449(21)
Total	19839	175396	101332	92322
Class	**12th Standard**			
Marks	***OC***	***BC***	***MBC***	***SC&ST***
≤34.9%	1102(6)	16946(10)	14597(14)	19674(21)
35%-49.9%	430(2)	8263(5)	8401(8)	10074(11)

50%-59.9%	2053(10)	31233(18)	22617(22)	22774(25)
60%-74.9%	5838(29)	63853(36)	35535(35)	28957(31)
≥75%	10416(53)	55101(31)	20182(20)	10843(12)
Total	19839	175396	101332	92322

Note: Figures in parentheses are percentage to respective class total in each column.

Of all the determinants of marks, community, type of school and subject groups in higher secondary are important in determining the students' marks in the 12th standard examination. We attempt at a multivariate distribution of 12th standard students across the three characteristics mentioned above.

Table 7: Distribution of Students by Community, Type of Schools and Groups in 12th Standard

Com	Schools	Science	Commerce	Arts & Humanities	Vocational	Total
OC	Govt	2088(10.5)	947(4.8)	62(0.3)	410(2.1)	3507(17.7)
	Govt-aided	2998(15.1)	1564(7.9)	51(0.3)	359(1.8)	4972(25.1)
	Self-financing SSLC	1171(5.9)	271(1.4)	2(0.0)	52(0.3)	1496(7.5)
	Matriculation	7106(35.8)	2733(13.8)	3(0.0)	22(0.1)	9864(49.7)
	Total	13363(67.4)	5515(27.8)	118(0.6)	843(4.2)	19839(100)
BC	Govt	37765(21.5)	14755(8.4)	1414(0.0)	8574(4.9)	62508(35.6)
	Govt-aided	37759(21.5)	14266(8.1)	952(0.5)	7294(4.2)	60271(34.4)
	Self-financing SSLC	13976(8.0)	2755(1.6)	6(0.0)	688(0.4)	17425(9.9)
	Matriculation	29937(17.1)	4973(2.8)	8(0.0)	274(0.2)	35192(20.1)
	Total	119437(68.1)	36749(21.0)	2380(1.4)	16830(9.6)	175396(100)
MBC	Govt	33530(33.1)	13325(13.1)	1163(1.1)	7711(7.6)	55729(55)
	Govt-aided	15442(15.2)	6845(6.8)	606(0.6)	3672(3.6)	26565(26.2)
	Self-financing SSLC	6478(6.4)	1342(1.3)	14(0.0)	379(0.4)	8213(8.1)
	Matriculation	9583(9.5)	1080(1.1)	0(0.0)	162(0.2)	10825(10.7)
	Total	65033(64.2)	22592(22.3)	1783(1.8)	11924(11.8)	101332(100)
SC & ST	Govt	30587(33.1)	14225(15.4)	1781(1.9)	8249(8.9)	54842(59.4)
	Govt-aided	13982(15.1)	7084(7.7)	859(0.9)	4330(4.7)	26255(28.4)
	Self-financing SSLC	3629(3.9)	1450(1.6)	17(0.0)	298(0.3)	5394(5.8)
	Matriculation	4927(5.3)	787(0.9)	1(0.0)	116(0.1)	5831(6.3)
	Total	53125(57.5)	23546(25.5)	2658(2.9)	12993(14.1)	92322(100)

Note: Figures in parentheses are percentages to the respective community total.

Table 7 shows that larger proportion of students across all the communities study in Science groups, followed by Commerce groups. Here too, the proportion of students is lower for MBC and SC & ST communities compared to OC and BC communities. What is interesting is the other end of the spectrum; we find relatively a larger percentage of students from the two depressed communities study in vocational groups compared to other two communities. So, there is a clear relationship between communities and groups chosen in the higher secondary course. Further, we find a larger proportion of students from OC and BC communities not only study Science and Commerce groups, but quite a larger proportion within these groups study in private schools, that is, self-financing SSLC and Matriculation schools and it is the reverse for the students from MBC and SC & ST communities. Thus, it is a combination of community, type of school and groups that determine the grades in the 12th standard examination.

Table 8 shows that the proportion of students who scored more than 75 per cent in 12th standard examinations has been larger than their share in the total enrolment for the examination. Thus, community correlates with grades that the students get in the examination. If we further classify this data in terms of schools and subject groups, we shall see some discernible pattern.

Table 8: Distribution of Students scored more than 75 per cent in 12th Standard

Community	Total Appeared	Scored greater than 75%
OC	19,839(5.10)	1041(10.8)
BC	1,75,396(45.10)	55104(57.1)
MBC	1,01,332(26.06)	20185(20.9)
SC&ST	92,322(23.74)	10846(11.2)
Total	3,88,889	96551

What we find in Table 9 is in line with the trend discussed so far. In the OC category, nearly 97 per cent of the students who scored more than 75 per cent have scored in the science and commerce groups, and nearly three-fourth of them studied in private schools. Compare this with the students in the SC & ST category, where only 78 per cent have scored more than 75 per cent in the science and commerce groups and nearly one-third of them studied in government schools. Thus a combination of community, school and subjects determine the marks in the 12th standard examinations.

Table 9: Distribution of Students with greater than 75% marks by school and groups

Community	School	Science and Commerce	Arts and Vocational
OC	Govt & Govt-aided	2484(23.8)	245(2.4)
	Self-fin SSLC&Matric	7634(73.3)	53(0.5)
	Total	10118(97.1)	298(2.9)
BC	Govt & Govt-aided	21905(39.8)	4589(8.3)
	Self-fin SSLC & Matric	28076(51.0)	534(1.0)
	Total	49981(90.7)	5123(9.3)
MBC	Govt & Govt-aided	8680(43.0)	2640(13.1)
	Self-fin SSLC & Matric	8630(42.6)	235(1.2)
	Total	17310(85.6)	2875(14.2)
SC&ST	Govt & Govt-aided	4871(44.9)	2221(20.5)
	Self-fin SSLC & Matric	3621(33.3)	142(1.3)
	Total	8483(78.2)	2363(21.7)

Note: Figures in parentheses are percentages to the community total for 'greater than 75%'

Determinants of Marks in Terminal Examinations

Having analysed the close relationship between marks obtained in 10th and 12th standard examinations and the various social and school characteristics, we hypothesise that a set of variables shall determine the marks obtained in 10th standard examination and those marks would, along with other factors could determine the marks obtained in 12th standard examinations.

In the first step, we conceive a linear function, in which the percentage of marks obtained in 10th standard examination is a function of gender, location, community, type of school and age of the students. Of these factors, gender, location, community and type of school are dummy variables. Age is measured by years upto 2 decimals. In addition to these variables, we include two more aggregate variables, which indicate the economic and educational environment of the students in each district. Hence, we take 31 district level per capita income in 2009-10 and literacy rate in 2011 for this analysis.

The regression specification is as follows:

$$y_i=a_1+a_2\,x_1+a_3\,x_2+a_4\,x_3+a_5\,x_4+a_6\,x_5+a_7\,x_6+a_8\,x_7+a_9\,x_8+a_{10}\,x_9+a_{11}\,x_{10}+a_{12}\,x_{11}+\mu_i$$

Here, y_i is 10th standard marks expressed as percentage to total,

x_1 is gender dummy, boy=0, girl=1,

x_2 is location dummy, urban=1, rural=0,

x_3, x_4 and x_5 are three community-dummies, (OC, BC, MBC), keeping SC & ST as reference variable,

x_6, x_7, and x_8 are three types of school dummies (Government-aided, Self-financing SSLC and Matriculation schools), keeping government school as reference variable,

x_9 is the age of students measured in years up to two decimals,

x_{10} is the average district level per capita income for the years 2007-10, measured at current prices, there are 30 district per capita income values in the study,

x_{11} is the district level literacy rate for the year 2011,and

μ_i is the residual item.

We expect all the independent variables to have positive coefficients, that is, all the variables positively influence the dependent variable, namely, the 10th standard marks. The regression equation given below has adjusted R^2=0.209 and all the coefficients are significant at 95% level of confidence.

$$y_i=124.688+2.548x_1+.900x_2+7.245x_3+5.748x_4+3.177x_5+6.497x_6+ 9.612x_7+11.259x_8-3.875x_9+.000074x_{10}-.147x_{11}+\mu_i$$

Except age and literacy rate, all other variables have positive coefficients. Age should positively influence the marks, as older students have more maturity to learn; strangely this is not the case in our sample. Similarly, higher district literacy rate should positively influence the academic achievements of students, but once again, this coefficient has negative sign. Possibly, some of the otherwise educationally backward districts have more number of good schools. The students from MBC, BC and OC communities get increasingly higher marks when compared to students from SC and ST communities. Likewise, students from Matriculation, Self-financing SSLC and government-aided schools get higher marks than students from government schools. The urban students on an average score 0.9 per cent more than the rural schools. As expected, the girls get 2.548 per cent more marks than the boys. District per capita income positively influences the marks. On the whole, we have good fit of the linear regression equation that we have conceived.

Using this regression equation we have calculated the unstandardized predicted values of the 10th marks for all the students. We now construct an equation for the 12th standard

marks. This equation has a similar specification as the previous one, but run with a different data set. The general specification of the regression equation is given hereunder.

$$y_i=a_1+a_2\,x_1+a_3\,x_2+a_4\,x_3+a_5\,x_4+a_6\,x_5+a_7\,x_6+a_8\,x_7+a_9\,x_8+\mu_i$$

Here, y_i is 12th standard marks of students in the sample,

x_1 is location dummy, urban=1, rural=0 for 12th standard students,

x_2 x_3, and x_4 three types of school dummies (Government-aided, Self-financing SSLC and Matriculation schools), keeping government school as reference variable,

x_5, x_6, and x_7 are the three types of 12th standard subject dummies (Science, Commerce, and Arts), keeping vocational courses as reference variable,

x_8 is the unstandardised predicted 10th standard marks for each student, and

μ_i is the residual item.

First, we obtained the unstandardised predicted values of the 10th standard marks for all the 3,88,889 students from the equation discussed above and used that variable as an independent variable in the second regression equation to estimate the determinants of the 12th standard marks. Here we consider only the 12th standard marks in percentage, as we do not consider the pass and fail status of the students. Some of the students who, at the aggregate level scored more than 35%, but could be declared fail, because they have not obtained the required 35% in any one or more of the papers.

The regression equation has an adjusted R^2=.322 and all the coefficients are significant at 95% level of confidence.

$$y_i=18.258+.385x_1+4.383x_2+9.923x_3+11,157x_4-8.475x_5-7.495x_6 \\ -10.129x_7+.729x_8+\mu_i$$

Urban students score more than the rural students, students from government schools score less than the students from the three other types of schools. Similarly students of vocational groups score more than the students of other subject groups. The positive sign of the coefficient attached to unstandardised predicted variable, show that the cumulative effect of schooling up to 10th standard has a positive influence on 12th standard marks. The regression analyses given so far prove that community, location and type of school up to high school do significantly influence the choice of courses and schools in the higher secondary and also the academic performance of students at both the levels.

Conclusion

The entire school system is designed to further the educational gaps between students of different communities divided by social and economic factors. Students from the Most Backward Communities and SC and ST communities do suffer from social, economic and educational backwardness at home. When most of them study in government schools and quite a substantial number of them in vocational and arts courses, school, the only institution of hope to compensate for their backwardness, does not provide the academic training and impart learning skills that put them on par with the students of other communities, at least in the academic performance measured in terms of marks obtained in the common examinations. If schools, particularly, the government schools have to perform the duty of a social and educational equaliser, then, they have to be at least twice as efficient as the self-financing educational institutions.

References

Bhaumik, S. K and M. Charkaborthy. 2010. *Mother or Motherland: Can a government have an impact on educational attainment of the population? Preliminary evidence from India*, Discussion Paper No 4954, Institute for the Study of Labour, Bonn, Germany.

Cameron, S and J. Heckman. 1998. Life Cycle Schooling and Dynamic Selection Bias: Models and Evidence for Five Cohorts of American Males. *Journal of Political Economy*, 06, pp 262-333.

Ermisch, J. and F. Macro. 2001. Family Matters: Impacts of Family Background on Educational Attainments. *Economica*, 68 (270), pp. 137-156.

NCERT. 2005. *National Curriculum Framework-2005*, National Council of Educational Research and Training, New Delhi.

Robert, M. D. 1980. Social Background and School Continuation Decisions. *Journal of the American Statistical Association*, 75 (370), pp. 295-305.

Srinivasan, R. and Karpagam, M. 2012. Who performs Better and Why in Higher Secondary Examinations? – An Analysis of 2009 Results in Tamil Nadu. *Journal of Educational Planning and Administration*, XXVI (4), pp. 579-590.

Valbuena, J. 2011. *Family Background, Gender and Cohort Effects on Schooling Decisions*. Discussion Paper no KDPE 1114, School of Economics, University of Kent, England.

Whitmore, D. 2005. Resource and Peer Impacts on Girls Academic Achievement: Evidence from a Randomised Experiment. *The American Economic Review*, 95 (2), pp. 199-203.