International Journal of Innovation, Creativity and Change. www.ijicc.net
Volume 15, Issue 2, 2021

The Demand for Shadow Education: Socioeconomic Determinants and Implications

Ghulam Mustafa[1], Ayesha Ishaque[2], Asim Iqbal[3], Nawaz Ahmad[4], Summaira Malik[5], Dr Aftab Anwar[6], [1]Assistant Professor, Department of Economics and Business Administration, Division of Arts and Social Sciences, University of Education Lahore, Lahore, Pakistan [2]Research Scholar, Department of Education, Uuniversity of Management and Technology, Lahore, Pakistan [3]Assistant Professor, Department of Economics and Business Administration, Division of Arts and Social Sciences, University of Education Lahore, Lahore, Pakistan [4]Associate Professor, Department of Economics, University of Lahore, Lahore, Pakistan [5]Assistant Professor. Department of Economics, COMSATS University Islamabad (CUI), Lahore Campus, Lahore, Pakistan, [6]Department of economics and business administration, University of Education, Lahore, Pakistan.
Email: [1]ghulam.mustafa@ue.edu.pk, (author's correspondence)
[2]ayeshaasim85@gmail.com, [3]asim.iqbal@ue.edu.pk,
[4]nawaz.ahmad@econ.uol.edu.pk, [5]drsummairamalik@cuilahore.edu.pk
[6]aftab.anwar@ue.edu.pk

The supplementary tutoring, broadly known as shadow education (SE) has proliferated around the globe and become a multi-billion dollar industry. The participating households devour a substantial amount of income on SE by considering it as a future investment to build the beneficiaries' scholastic accomplishments. The present study is endeavoured to examine the various factors which lead to provoke families to choose supplementary tutoring. The primary data has been collected from 240 households by utilising a multi-stage random sampling technique through questionnaire from the Sargodha Division of Pakistan. The study used logit regression to explore the socio-economic drivers of SE and simple regression, to investigate the effect of SE on students' performance. The study found the significant impact of location (rural and urban), gender, income and parents' education on SE. Moreover, the results indicate that SE has a positive effect on students' performance at the cost of substantial budget share of households and thus it may create gender and regional inequality in terms of education. The policymakers should revamp educational policies to increase the performance of educators and students, to bring about educational and social equalities.

Key words: *Demand; Determinants; Educational Inequality; Parentocracy; Sargodha; Shadow Education; Students' Performance*

1. Introduction

Marketisation and privatisation tendencies under neo-liberalism have transformed education from a public into a private good to a great extent (Ball, & Youdell 2008; Bray, 2020). Private supplementary tutoring is occupying a major position in this context. It has been increasingly utilised by parents and teachers as part of wider strategies to assist their children and students' educational careers (Liu, 2019). This phenomenon has made supplementary tutoring a multi-billion dollar global service-industry (Bray & Lykins, 2012). Recently, tuition centres and academies have proliferated around the world and shadow education has become the new formal in the crowded global educational space (Bray *et al.* 2015; Punjabi, 2020). On the one hand, additional offers in the field of shadow education have been welcome as an investment in students' educational career and human capital accumulation (Dang & Rogers 2008, Stecher *et al.* 2018).

Shadow education usually is imparted to low performing pupils and pupils with a low educational family background. Seen from this angle, shadow education is a coping strategy against educational inequality. On the other hand, shadow education is costly. It puts additional burden on families' household budget. Poor families can hardly afford enough lessons or high qualified tutors than their rich counterparts and, consequently, shadow education creates social inequality. Shadow education swallows up all students' leisure time and thereby these students show less interest in the mainstream classes (Bray, 2009; Byun *et al.*, 2018). Given these limitations, some countries tried to dampen tutoring markets but failed because of a lack of empirical evidence for their measures (Bray, 2009; Lee *et al.*, 2009). Therefore, a better understanding of the demand factors of shadow education seems necessary in order to give more practical implication. The present study, therefore, aimed to find factors behind the growth of shadow education in a selected district of Pakistan.

Tutoring, extra lessons/study, private tuition, out of school education, and shadow education are the terms, used to define the phenomenon of home tuitions and private tuitions. However, shadow education is frequently used in the literature. Bray (2006) was of the opinion that additional coaching of mainstream courses is beyond the hours of schooling.

In many developing countries such as Pakistan, primary education at the public sector schools is highly subsidised. However, the benefits of these kinds of subsidised education do not

reach the most deprived households' children because of the low perceived benefits and very high opportunity costs involved. Therefore, most of them stay away from school. This increased visibility generates two immediate consequences. First, shadow education has been better documented (even not documented in case of Pakistan); and shadow education appears to have become denser and expanded (Lee *et al.*, 2009).

Shadow education is rapidly increasing across the globe. In England, Ireson and Rushforth (2014) estimated that 27% of primary and secondary students had supplementary tutoring for help and exams with daily learning. Baker *et al.,* (2001) found that 75% of grade eight learners in South Africa have received extra tuition in mathematics. In Canada, Aurini and Davies (2004) found that the private supplementary educational business had grown between 200% and 500% in major cities of Canada over the past three decades. They further noted that about 24% of Ontario parents with school-aged children had hired private teachers in 2002. Silova *et al.* (2006) indicated that students of the final year of secondary school had received supplementary tutoring in the form of lessons or courses. For instance, 56% of the respondents reported receiving such tutoring in Slovakia, 66% in Poland, 71% in Mongolia, 79% in Ukraine, 80% in Georgia, and 93% in Azerbaijan. Among all the countries, perhaps, Korea spends the highest amount (3% of GDP) on shadow education. In Pakistan's context, it was found that 17% of public and 34% of private school students undertake supplementary tutoring in Punjab as per the Annual Survey of Education (2013). These researches show that the recent development of supplementary tutoring is indeed occurring globally.

It may be that some (particularly wealthy families) favour private supplementary tuition to gain human capital for their children. However, the major problem is that it is costly (especially for poor and middle-income families). Private supplementary tutoring is occupying a significant position in the Pakistan's educational system in such a way that heavy dependency on shadow education will perpetuate or even exacerbate the widening income gap across generations between rich and poor. Despite the highly demanding topic, research is still muddled and under process regarding the demand for shadow education. Therefore, the current study aimed to answer the following questions: (1) what is the socio-economic status of students taking private tutoring? (2) What are the determinants of demand for shadow education? And (3) does shadow education significantly affect student's performance? The prior empirical literature in this area at the micro-level is scant in South Asia, particularly for developing countries like Pakistan. This study contributes to the existing literature by two folds: *firstly*, it examines the micro determinants of SE by collecting primary data and focussing only in the Sargodha Division of the Punjab province of Pakistan. *Secondly*, at a micro level, it also examines the impact of SE on students' performance.

2. Conceptual Framework

At two levels, demand for SE models have been applied both on macro and micro level. On the macro level, the demand for SE flourishes in the presence of meritocracy. In meritocratic societies, social values such as personal economic outcomes and job opportunities are allocated according to educational successes that is measured by academic credentials. For instance, it has been found that university graduates have lower risk of unemployment and earn higher salaries than graduates from vocational education programs (Hausner *et al.* 2015; Stüber, 2016). Therefore, many parents demand SE for their children at secondary and primary level (Paulus and Blossfeld, 2007).

Historically, shadow education was considered an Asian phenomenon. SE is often linked to somewhat exotic cultural practices limited to East Asian Confucian-influenced culture. Hence, at a macro level, a cultural-path dependent model was frequently used in previous literature and found that SE is the biggest secret among the Asian Nations' for higher academic achievements (Byun *et al.*, 2018; Bray, 1999; Park, 2013; Stevenson & Baker, 1992). A country's economic condition is another macro level factor that is strongly associated with SE. In this context, Baker *et al.*, (2001) found that national economic development is highly linked with the use of SE. The factors underlying demand vary according to social and cultural contexts. For instance, in Asian societies particularly, India, Pakistan, the Republic of Korea, Taiwan, Japan, and Hong Kong, the demand for SE is high because the dominant culture stresses effort (Salili, 2005; Watkins & van Aalst, 2014). This is due to the fact that high-stake tests intensify the stress in these societies. By contrast, Aurini *et al.*, (2013) noted that abilities to handle stresses are more in developed countries; therefore, SE is limited in North America, Australia, and Western Europe. As a result, students in these economically developed countries tend to depend less on SE than students in developing societies.

At a micro-level, two theories were frequently used in the literature such as the human capital model and a reproduction model. At household (micro) level, parents invest in their children's education to gain human capital for labour market success (Dang & Rogers, 2008; Heyneman, 2011) and SE may catalyse this process. Such investments play a significant role in the nation's economic growth and human capital acquisition. Therefore, such activities are helpful to understand the parents' motives to invest in SE in general, and thus should be encouraged (Dang & Rogers, 2008; Heyneman, 2011). The limitation of this model is that it does not inform a specific pattern of stratification in the use of SE by socioeconomic status (SES). Moreover, this model assumes that parents make rational decisions about their

investment based on the cost/benefit analysis regardless of their SES. However, the reproduction model contradicts this model.

A reproduction model of family decision making states that rich households demand SE for their children's educational advancement to reproduce their elite status (Stevenson and Baker, 1992). A growing body of literature is evident of this reproduction model (Bray *et al.*, 2014; Liu & Bray, 2020; Nath, 2008). Educational sociology predicted that SE as form of marketed educational services, is an important strategy for high SES parents to advance their children's educational opportunities (Byun *et al.*, 2018; Liu, 2019). Consumer theory of microeconomics can assist in understanding dynamics of parental rational decision-making in their demand for private tutoring. The theory states that people make rational decisions and rationally rank a bundle of goods or services from the available limited resources (Varian 2010). In the domain of SE, consumer preferences indicate how families rank different possibilities based on the perceived utilities of those possibilities to support their children's education.

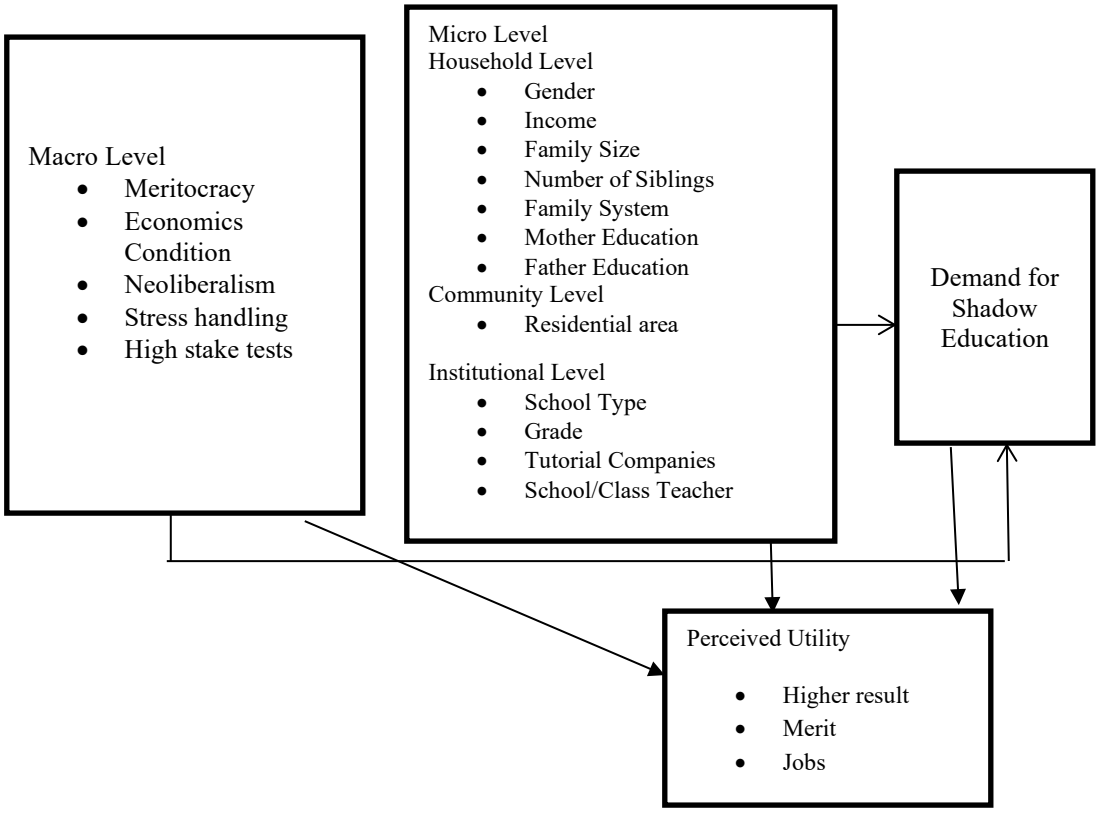

Figure 1 Factors deriving Shadow Education (Conceptual Framework)

There are a number of factors that shaped the demand for shadow education. Zhang and Bray (2015) categorised these factors into four primary levels, such as systemic, institutional, community, and micro-level. These further can be divided into macro and micro level determinants. Meritocracy, jobs opportunities, and career development are the link between macro and micro levels. Based on the previous discussion a conceptual framework is developed as can be seen in Figure 1. There is burgeoning literature on shadow education, most of which looks into the macro aspects. However, studies dealing with the impact of micro-level determinants on SE using primary data are scanty. Hence, the current study empirically investigated these factors that can be seen in next subheadings.

3. Methodology

3.1 Study Design

The primary data was collected from the division of Sargodha through a structured questionnaire. The research survey was governed by the authors. A face-to-face interview was organised for illiterate parents. The factor of illiteracy on the part of parents, especially in rural areas of Sargodha division paved the way for using this approach. That is why a face-to-face interview through a close-ended questionnaire is the best way to collect the data from those parents who cannot read and write. The interviewees were asked to give information related to their socio-economic condition, education level, shadow education and the related expenditures. All the research ethics were followed in the study. Parents were informed about the purpose and objectives of the research to retain confidence at all levels. The respondents were informed about their benefits and rights, usage of data, and the surveyor is accountable for the privacy of information.

Table 1 Selection of the Sample Size

District	Sargodha		Mianwali	
Tehsils	Sargodha	Sahiwal	Mianwali	Piplan
Wards	3	3	3	3
Union Councils	3	3	3	3
Households	10	10	10	10
Sub-Total	3x10+3x10=60	3x10+3x10=60	3x10+3x10=60	3x10+3x10=60
Grand Total	60+60+60+60=240			

Authors' Own Illustration

Note: Each Division in Punjab Pakistan consists of some districts depending upon population. Each District consists of four to five tehsils. Each Tehsil is further divided into

cities and union councils. Every city is divided into wards and every union council is combination of some villages.

Moreover, the obstacles in communications are extracted by translating the questionnaire in the Urdu language. In January 2018, the data was collected from 20 respondents for pretesting under the guidance of a leading supervisor. By using this sample data, a pilot study was done while conducting face-to-face interviews with parents. During this pretesting process, the researchers found some errors and ambiguities which were removed in the final questionnaire. For instance, it was found that the data concerning stationery and transportation expenditures related to the SE should also be collected from households. Further, some local language words were also incorporated for better understanding of questions, as there were many illiterate household heads in the selected sample. After incorporating these changes, the final data was collected in February 2018.

3.2 Data Collection and Sampling

A multi-stage sampling approach involving stratified and random selection was adopted to interview the parents of primary school going children from Sargodha division of Punjab. In the first stage, the Sargodha division is divided into two category comprising 120 households from each strata (i.e., urban and rural) using the stratified sampling approach. At the second stage, two districts of the Sargodha division were randomly chosen. On the third stage, four Tehsils[1] were chosen randomly (two from each district). In the fourth stage, three Union Councils[2] and three municipality wards were selected randomly from each Tehsil. At the fifth stage, 10 households were randomly selected from each Union Council and municipality ward, respectively. The total sample size, thus, became 240 households (Table 1). Descriptions of selected variables are given in Table 2.

[1] Tehsil is a sub part of the district
[2] Tehsils are further divided into Union Councils which consist of a number of villages

Table 2 Variables Descriptions, Measurement and Their Expected Signs

Variable	Description	Measurement	Expected Sign
L_i	Likelihood of student *i* taking shadow education	Taking SE=1; 0=otherwise	+
Y_i	Result of the particular primary school child	Percentage	----
Community Level Factor			
MC	Regional factor	Urban=1; Rural=0	+/-
Household Level Factors			
FEdu	Father's educational level	Years	+
MEdu	Mother's educational level	Years	+
HY	Presents head monthly incomes	Rupees	+
FSiz	Family size	Number of family members	+/-
NSS	School going siblings	Number of school going siblings	+/-
WFem	Working female	Number of working female	+/-
SGen	Gender of student	Male=1; Female=0	+/-
Institutional Level Factors			
SPer	Student performance	Percentage	+/-
STyp	School type	Private=1; Govt.=0	+/-

3.3 Empirical Model

The answer to the first research question was given by using descriptive analysis. Whereas the logistic model is employed to answer the second research question. By using the binary logistic model, the parameters of student's choice on taking shadow education is estimated as;

$$L_i = \left[\frac{P_i}{1-P_i}\right] = a + \beta_1 MC + \beta_2 FEdu + \beta_3 MEdu + \beta_4 HY + \beta_5 FSiz + \beta_6 FSys + \beta_7 NSS + \beta_8 WFem + \beta_9 SGen + \beta_{10} SPer + \beta_{11} STyp + e_i \quad (1)$$

where P_i and e_i denote the probability and usual error term respectively.

The third objective of the study, factors affecting the students' performance, could be analysed through multiple linear ordinary least square regression.

$$Y_i = a + \beta_1 MC + \beta_2 FEdu + \beta_3 MEdu + \beta_4 HY + \beta_5 FSiz + \beta_6 FSys + \beta_7 NSS + \beta_8 WFem + \beta_9 SGen + \beta_{10} SPer + \beta_{11} STyp + \alpha_{12} SE + e_i \quad (2)$$

4. Results and Discussion

The results are compiled in three parts. In the first part, the socioeconomic status of the household is given, in the second part impact of factors affecting SE and performance of students are given.

4.1 Socioeconomic Status of Household

The current study found that 60% of the sampled survey takes private supplementary tutoring, whereas 38.19% comes from government schools and 61.81% from private schools (Table 3). The results contradict the official statistics where the Government of Pakistan found that 34% private and 17% of government students take SE. However, the phenomenon of SE is increasing every year. This might be the reason that SE increased due to an increase in the gross enrolment of students at the primary level.

The phenomenon of SE is higher in urban areas (56.96%) as compared to rural areas (43.06%). However, the sample size was equally distributed among rural/urban disparities, and the results are in agreement with previous studies (Khan & Sheikh, 2013; Liu & Bray, 2018). Within metropolitan areas, tuition takers (56.96%) are higher as compared to non-tuition takers (39.58%). Similarly, regional disparity also exits within the region (Table 3). For instance, Sargodha has a higher number of tuition-takers (62.50%) as compared to non-tuition takers (31.25). The same phenomenon can be seen in the Mianawali district, where tuition-takers (37.50%) are lower as compared to their counter-factual (68.75%). However, an equal number of students were taken from each district.

SE increased with the level of grades. For instance, this study found that SE increases with the level of degree. Nowadays, parents are more conscious of their children's education. However, they have constraints in giving time to their children regarding supplementary tutoring by themselves. Particularly, the participation of females in the labour force has bonded this phenomenon. Hence, to overcome this issue, parents prefer to hire tutors or send their children for tuition. This might be the reason that SE participation is slightly increasing until grade four, where most of the exams held in the classes in the custody of main-stream school teachers. It suddenly increases in grade five because this exam is being taken by the board of elementary education by external examiners. This is the reason in grade five, 23.61%

of the students take SE as compared to their counter-factual 9.38%. The results can be supported from past study (Liu & Bray, 2018).

Table 3 Socio-Economic Status of Households

	Overall (%)	Tuition taker (%)	Non-tuition taker (%)
Sample size (N=240)	100.00	60.00	40.00
Community Level			
Urban	50.00	56.94	39.58
Rural	50.00	43.06	60.42
Sargodha	50.00	62.50	31.25
Mianawali	50.00	37.50	68.75
Gender			
Male	66.67	71.53	59.38
Female	33.33	28.47	40.63
School type			
Private	50.00	61.81	32.29
Government	50.00	38.19	67.71
Grade			
Nursery/Prep	8.8	6.25	12.50
1	12.9	10.42	16.67
2	10.0	9.03	11.46
3	10.4	8.33	13.54
4	17.9	23.61	9.38
5	40.0	42.36	36.46

Authors' Own Illustration

It was found that male school-going children were higher (66.67%) as compared to females (33.33%). Out of 60 percent of tuition taking students, 71.28% are male, while 27.72% are female. It means gender discrimination exists in Pakistan regarding pursuing of the SE as in other developing countries such as India and Bangladesh (Nath, 2008; Sujatha & Rani, 2011).

4.2 Education Level of Household

Parents' education is most important regarding the education of their children. Studies have found that there is a causal relationship between parents' and children's education. However, regarding SE, research is unclear in this regard. SE may or may not be related to parents' education. For instance, if parents are more educated and doing jobs, consequently they spare relatively less time for their children regarding supplementary education. Hence, they prefer to send their children to tuition centres. On the other hand, they (particularly mothers) may give time to the children and are less prone toward SE in addition to financial constraints.

The study in hand found that illiteracy is higher (45.00%) among female as compared to male parents (10.4%), and this is also in line with the official statistics provided by the government. In Pakistan, the majority of less-educated parents send their children (female) to have at least a basic education. Due to this reason, female literacy is a bit higher at primary (17.9%) and matric level (17.5%), as can be seen in Figure 2. The drop out ratio is higher after primary and matric level that is why female education in the sampled survey is lower (6.3% vs. 3.8%) as compared to their counter-factual, male parents, with 17.5% and 14.6%, respectively regarding middle and Intermediate (FA/FSc/A-level). Regarding higher education-bachelor, fathers are more educated (15.8%) as compared to bachelor-mother (6.7%). The same phenomenon can be seen regarding the professional degrees where male-parents have a more professional qualification (7.5%) as compared to mothers (2.9%).

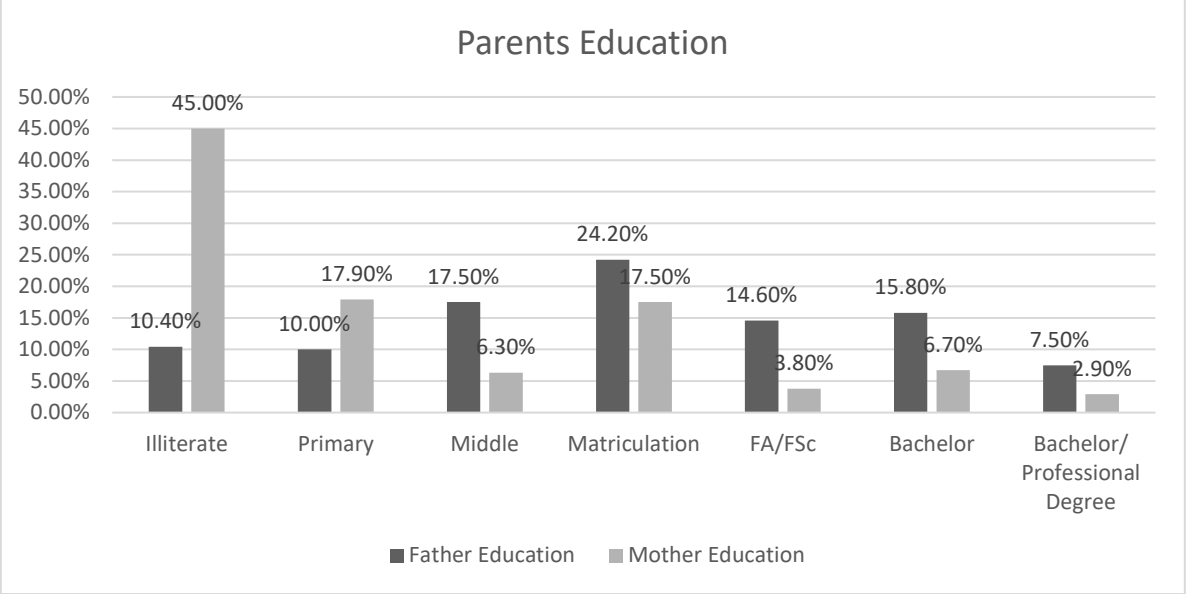

Figure 2 Parents Education

Household size plays a crucial role to obtain SE. For instance, if the household size is larger and has a smaller number of dependents, then SE increases because of a greater number of earning-members. On the other hand, a large family having more educated females may decrease expenditures on SE because higher numbers of family members are available to teach children at home, particularly in a combined family system. The study in hand found that only 7.9% of households have three members (father and mother with one child). The maximum household size (41.7%) consists of four-five family members, followed by six-seven members (38.8%) and more than seven members (11.7%), respectively. Numbers of siblings have an important role for SE. For instance, with higher numbers of school-going siblings SE would decrease because of more expenditures on main-stream education. The

current study found that the majority of the sampled survey (79.6%) have siblings from one-three siblings followed by four-five siblings (18.8%) and six-seven siblings (1.6%), respectively, as can be seen in Figure 3.

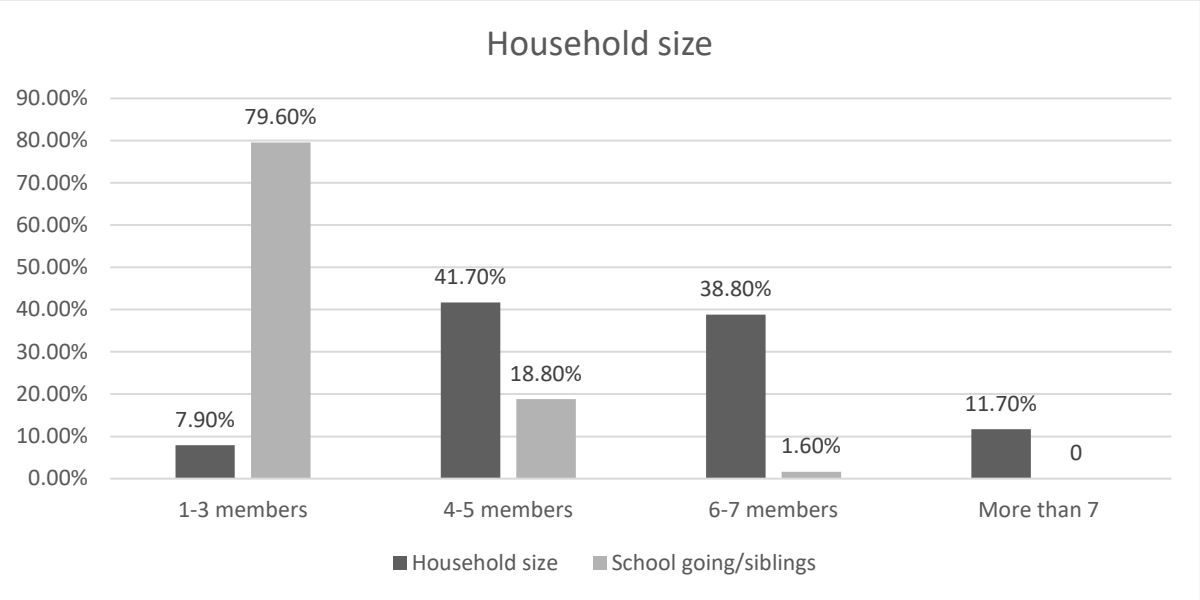

Figure 3 Household Size

Table 4 Patterns of Tutoring

Number of students with the same tutor	Percent
Do not take tuition	40.00
One to one coaching	3.3
Two students with the same teacher	7.1
Three students	11.3
Four students	16.3
Five or more than five	22.1
240	100.0

Authors' Own Illustration

The study found that the majority of students take tuition on their parent's advice. Thus, the study supports the hypothesis of Devi *et al.* (2011) who found that the parents are sole decision makers for purchasing SE. 16.7% of students take tuition because of peer group pressure (because all their friends and relatives take tuition). This could be the reason behind the desire to meet friends and fit into peer groups. Bray (2020) found that there are academic and non-academic motives that urge students for supplementary tutoring where academic motive includes fierce competition with fellow students and to improve grades, while non-

academic motives include to meet friends. Thus, our study is in agreement with the previous studies (Bray, 2020; Sujata, 2014).

The majority (22.1%) of the sampled students' study in a group of five or more students with the same tutor followed by four students (16.3%), three students (11.3%), two students (7.1%) respectively. However, only 3.3% of the sampled students take one-to-one tutoring (Table 4).

4.3 Regression Analysis

The present study regressed two models - logit regression to see the factors affecting SE and simple regression to check the factors affecting student performance in the school. Both models are a good fit. For instance, the LR Chi^2 value indicates that model is a good fit at $p < 0.01$ level of significance. R^2 value shows that 24.94% of variations are due to the independent variables enter into the model. Similarly, model two is also a good fit, and the R^2 value is reasonable-0.1686. The R^2 value is lower in the later model as compared to the former. This is due to some confounders such as teachers' ability to teach, students own skills and how hardworking they are. However, these confounders are handled by the error term.

The regression results showed that household size, number of siblings, number of working females in the household, access to the internet, father's and mother's education, household income, student gender and type of school have significant effect on the models as can be seen in Table 5.

The regression analysis showed that as people move from rural to urban, the demand for shadow education increases. Previous studies also indicated that the demand for shadow education is shaped by the area, and the urban areas demand it more than rural areas do (Silova, 2010; Zhang, 2013). The reason is quite visible in that in urban areas people have more access to private institutions and a more competitive environment concerning examinations (Brehm & Silova, 2014; Nath, 2008; Tansel & Bircan, 2006).

Previous class/test results indicate that a positive impact on SE education. This is because parents want to maintain their children's good grades, and hence, if they get good grades, they put them on tuition to maintain those grades. Our results can be supported from previous studies (Bray, 2020; Zhang & Bray, 2018). Similarly, SE has a positive impact on the mainstream school results. For instance, as students take supplementary tutoring, their performance in school increases by 7.15%. The evidence of the current study is comparable to those studies that have predicted an increase in students' performance after taking shadow

education (Banerjee *et al.*, 2007; Bray, 1999, 2014; Dang, 2007; Schacter, 2000). After analysing that, this outcome can be utilised to promote and encourage the activities of shadow education as a supplemental education, which prepared the students with knowledge and skills and ultimately ends with improved performance.

If the child is in private school, the probability of SE increases and so results, for instance, indicate that the possibility of SE for private school students is more as compared to government schools' students. This may be because, in government schools, most of the low-income families' children study, and they have financial constraints to join costly tuition centres. Similar results were found by Khan and Sheikh (2013), who found that private school students are more likely to get shadow education as compared to government schools in Pakistan. Similar results were found in other developing countries (Byun & Park, 2012; Zhang & Bray, 2015).

Table 5: Regression Analysis

Factors Affecting SE and Result of Students Performance	Logit Regression (SE)		OLS (Students' Performance)	
	Coef.	Std. Err.	Coef.	Std. Err
Residential Area (1=urban; 0=rural)	0.30	0.33	-1.05	1.74
Household size (numbers)	-0.13	0.16	1.67	0.72**
School going siblings (Numbers)	0.47	0.19*	-1.04	1.01
Female in the household (numbers)	-0.29	0.20	-1.10	1.05
Working female (numbers)	0.76	0.43***	-0.29	1.89
Internet (1=yes; 0=otherwise)	-1.95	0.46*	4.68	2.47***
Smart phone (1=yes; 0=otherwise)	0.44	0.42	1.39	2.02
Father education (>Inter=1; <Inter=0)	0.63	0.42***	1.24	1.91
Female Education (>Matric=1; <Matric=0)	0.84	0.41 **	-1.28	1.96
Income of household head (Rs/month)	0.00002	0.00001	-0.0001	0.0001***
Gender of student (1=male; 0=female)	0.88	0.38 **	-4.76	1.99*
Type of School (private=1; government=0)	0.99	0.40*	4.50	2.03**
Previous results (percentage)	0.05	0.013*	-	-
SE	-	-	7.15	1.95*
Constant	-5.33	1.31*	73.68	3.57*
Model Goodness (LR Chi^2)	80.58*		--	
Model Goodness (F-Statistic)	--		4.63*	
R^2	0.2494		0.1686	

Authors' Own Illustration

Note: Inter=Intermediate/A level; Matric=O-level; std. err. are the standard error; values in the parenthesis are the probability values while *,** and *** show the significance level at $p<0.01$, $p<0.05$ and $p<0.10$, respectively.

The probability of a male child having SE is more compared to the female child. However, it has a negative and significant impact on performance at school. It is observed that female children get less chance for SE even when their performance is still better than male students in the schools. Previous studies also reported that gender discrimination exists regarding SE

in developing countries, and parents spend more on the male child as compared to females (Aslam & Atherton, 2012; Nath, 2008; Sujatha & Rani, 2011).

Parents' education has a crucial role to play for children's education. The study in hand incorporates the parents' schooling in the regression analysis keeping in mind that they have enough knowledge to teach the children. For instance, the education system is very dynamic in Pakistan. The parents got education a decade ago, that was possibly quite different compared to the present modern education system. Notably, the grammar school in Pakistan has up-to-date course content for the school. A decade ago, English language lessons started from grade six, but now English in the syllabus starts from pre-nursery classes. Hence, the parents who got matriculation more than a decade ago might be unfit to teach the children. Therefore, we incorporate the dummy variable in such a way that if parents have more than matriculation education as one or zero if they have less than matric qualification. In both cases, results indicate that as the level of education increases, the probability of SE increases due to parents' involvement in a good job due to higher qualification. This result is consistent with previous studies, which indicated that students' probability for taking shadow education increases if their parents are educated (Xue & Ding, 2009; Zhang, 2013).

The results found that positive association exists between the number of siblings and SE and the former significantly affected the latter. This happens possibly due to the positive competition among siblings. If the performance of any child is reduced (this is indicated from the second model where a higher number of siblings has a negative impact on student performance), the parents decide to send all children for supplementary tutoring due to economy of scale. Additional children from the same house to schools/tuition centres gets a discount on their fees.

Females in the household have significant roles to play regarding the performance of the students and their careers ahead. Previous studies only considered the mother's education as an explanatory variable to determine the students' performance in school. The present study examines both the number of working-females and the number of females in households. The results indicate that the number of females in the house negatively impacts the students' performance as well as SE although insignificantly. This is due to the fact that illiteracy among females in Pakistan is much higher than compared to males. Additionally, previous results also indicated that 45% of the mothers in the sampled survey are illiterate. However, our main concern is the working females. Similarly, family income is another factor for the demand for SE. It has a positive impact on SE. Past literature also found similar results (Kenayathulla, 2012).

Household size is also imperative for SE as well as the students' class performance. For instance, if the household size is larger, then SE is more because of a higher number of earning-members. On the other hand, SE may decrease due to larger family sizes because of more number of female family members, which also teach the children and their siblings and cousins in case of combine family systems. For instance, this study found that as household size increases, students' performance in the mainstream school becomes better, e.g., with one-member increase in the family size, about 1.67% increase in the percentage of child's school results. On the other hand, increasing household size is positively associated with SE, although insignificantly. While considering household size data found a positive and significant correlation between the demand for shadow education and the number of children in district Sargodha. With the increase in household size, demand for shadow education increases by 0.0489 units. It may illustrate that even large families are demanding shadow education for their children because some sort of tutoring is affordable for them. This result also shows that households try to secure SE and broadly treat it as a necessity anyway (Bray et al., 2014).

Household head income has significant positive associations with the probability of taking private supplementary tutoring. When the household head's income increases, the likelihood of taking private tutoring also increases 1 times more than the others who have less income. The direct relationship between family income and private tutoring can also be supported from past studies (Chu, 2009; Kenayathulla, 2012; Tansel & Bircan, 2006).

The study incorporated technological factors and found that the internet is significantly negative related to SE demand and positively associated with students' performance. This may be the reason behind why parents access help from internet regarding new teaching methods and impart them to their children. This result is contrary to Bray (2020) who found that the internet could be helpful for SE and for locating tutors.

5. Conclusion and Implications

SE has a significant impact on the students' academic outcomes in the short run. It indicates that if student performance is low, then tuition is better in the short-run. However, in the long-run, it may put a burden on the household budget. If tutorial centres will operate in parallel to schools in the long run, some of the best teachers may leave the schools. It will further reduce the quality of school education and perhaps tutoring would become even more necessary. Thus, policymakers should set such educational policies that increase teachers' and school performance in the long run. Therefore, the government should regulate the well-established educational system, and ensure that at least the educators in both institutions,

public and private, should be Masters, B.Ed. This is so they can teach their students efficiently in such a manner that each student would not need any supplemental education.

The most important implication of the study is that household characteristics such as household size and number of females in the house do not significantly impact the SE except the educated and working females. This could be the reason behind that educated female's do the jobs who in turn help in financing the SE thereby reducing the economics burden of SE. Females are significant predictors of SE although less educated to their counterparts, males. Therefore, the present study recommends that females' education should be encouraged in developing countries.

There are three types of disparities exisiting in Pakistan's SE system. Firstly, the demand is significantly higher for private school students rather than government students. Secondly, regional disparity is there as urban students are taking more SE compared to counterfactual, rural students. Moreover, gender discrimination exists regarding supplementary tutoring. These three results are also statistically significant and major factors of SE. From this point of view, results show that the current SE system in Pakistan is creating social grouping and generating social inequality. Additionally, the study found that there is high price discrimination in tuition expenditures while, almost 60% of the respondents take SE. This means that demand for SE is increasing, but there is no price regulation. So, there is a need to regulate markets for SE, which could set an equitable price system for each consumer. Tax can be levied on well-established tuition centres and revenues from these taxes can be used to improve the quality of government schools particularly in rural areas. These results are of significance for other developing countries because such disparities exist in most developing societies.

This study has determined the driving forces of SE at micro level. However, further research is required to find the factors affecting demand for SE at macro level by incorporating factors such as student teacher ratio, high-stake tests level in different schools.

REFERENCES

Aurini J & Davies S 2004. The transformation of private tutoring: Education in a franchise form. *Canadian Journal of Sociology*, 29(3):419–438.

Aurini J, Davies S & Dierkes J 2013. *Out of the shadows: The global intensification of supplementary education.* Bingley: Emerald.

Baker DP Akiba M LeTendre GK & Wiseman AW 2001. Worldwide shadow education: Outside-school learning, institutional quality of schooling, and cross-national mathematics achievement. *Educational Evaluation and Policy Analysis*, 23(1): 1-17.

Ball SJ, & Youdell D 2009. Hidden privatisation in public education. *Education Review*, 21(2): 73-83.

Banerjee AV, Cole S, Duflo E & Linden L 2007. Remedying education: Evidence from two randomized experiments in India. *The Quarterly Journal of Economics*, 122(3):1235-1264. https://doi.org/10.1162/qjec.122.3.1235

Bray M 2009. *Confronting the shadow education system: What government policies for what private tutoring?* Paris: UNESCO International Institute for Educational Planning (IIEP). Available at http://www.unesco.org/iiep/eng/publications/recent/abstracts/2009/ Bray_Shadoweducation.htm. Accessed 4 January 2020.

Bray M 2011. *The challenge of shadow education: Private tutoring and its implications for policy makers in the European Union*. Brussels: European Commission.

Bray M & Kwo O 2014. *Regulating private tutoring for public good: Policy options for supplementary education in Asia*. Hong Kong and Bangkok: Comparative Education Research Centre, The University of Hong Kong, and UNESCO.

Bray M & Lykins C 2012. *Shadow education: Private supplementary tutoring and its implications for policy makers in Asia*. Mandaluyong City and Hong Kong: Asian Development Bank and Comparative Education Research Centre, The University of Hong Kong.

Bray M, Zhan S, Lykins C, Wang D & Kwo O 2014. Differentiated demand for private supplementary tutoring: Patterns and implications in Hong Kong secondary education, *Economics of Education Review*, 38:24-37. https://doi.org/10.1016/j.econedurev.2013.10.002

Bray M, Kwo O, & Jokic, B 2015. *Researching private supplementary tutoring. Methodological lessons from diverse cultures*. Hong Kong: Comparative Education Research Centre and Springer.

Bray TM 1999. *The shadow education system: Private tutoring and its implications for planners*. Paris, France: UNESCO International Institute for Educational Planning.

Bray M 2020. Shadow Education in Europe: Growing Prevalence, Underlying Forces, and Policy Implications. *ECNU Review of Education*, 1-34. DOI: 10.1177/2096531119890142

Byun S Chung H & Baker D 2018. Global patterns of the use of shadow education: Student, family, and national influences. *Research in the Sociology of Education*, 20, 71-105. doi:10.1108/S1479-353920180000020004.

Chu HL 2009. Family background characteristics and personal factors of Chinese primary and secondary students attending private tutoring. *Education Research Monthly,* 12:22–27.

Coetzee J 2008. Supplementary tuition in mathematics: Exploring the industry in the Eastern Cape. MSc dissertation. Pretoria, South Africa: University of South Africa.

Dang HA 2007. The determinants and impact of private tutoring classes in Vietnam, *Economics of Education Review*, 26(6):683-698.

Dang HA, & Rogers FH 2008. The growing phenomenon of private tutoring: Does it deepen human capital, widen inequalities, or waste resources?. *The World Bank Research Observer*, 23(2), 161-200.

Devi R Singh H Pal K Dhodiya JM Hanson R Amedeker MK & Hazarika D 2011. A study of perception of parents, students and teachers towards private tuitions-A case study of Kathua Town. *International Journal of Educational Administration*, 3(1), 1-8.

Gupta A 2019. Teacher-entrepreneurialism: A case of teacher identity formation in neoliberalizing education space in contemporary India. *Critical Studies in Education*, 1-7 https://doi.org/10.1080/17508487.2019.1708765

Hausner KH Söhnlein D Weber B & Weber E 2015. Qualifikation und Arbeitsmarkt: bessere Chancen mit mehr Bildung [Better chances with more education]. (No. 11/2015). IAB-Kurzbericht. Retrieved from http://doku.iab.de/kurzber/2015/kb1115.pdf.

Heyneman SP 2011. Private tutoring and social cohesion. *Peabody Journal of Education*, 86(2), 183-188.

Ireson J & Rushforth K 2004. *Mapping the nature and extent of private tutoring at transition points in education*. Paper presented at the British Educational Research Association conference, UMIST, Manchester, 16-18 September.

Kenayathulla HB 2012. An economic analysis of household educational decisions in Malaysia. PhD dissertation. Bloomington, Indiana: Indiana University.

Khan BH & Shaikh SA 2013. Analyzing the Market for Shadow Education in Pakistan: Does Private Tuition Affect the Learning Gap between Private and Public Schools? *The Lahore Journal of Economics*, 18:129.

Lee CJ, Park HJ & Lee H 2009. Shadow education systems. In G Sykes, B Schneider & DN Plank (eds). *Handbook of education policy research*. New York, NY: Routledge.

Liu J 2019. A Structural Equation Modeling Analysis of Parental Factors Underlying the Demand for Private Supplementary Tutoring in China. *ECNU Review of Education*, 2(1), 7-24. https://doi.org/10.1177/2096531119840856

Liu J & Bray M 2020. Private Subtractory Tutoring: The Negative Impact of Shadow Education on Public Schooling in Myanmar. *International Journal of Educational Development*, 76(2020):1-8. https://doi.org/10.1016/j.ijedudev.2020.102213

Nath SR 2008. Private supplementary tutoring among primary students in Bangladesh. *Educational Studies*, 34(1):55–72. https://doi.org/10.1080/03055690701785285

Park H 2013. *Re-evaluating education in Japan and Korea*. New York, NY, USA: Routledge.

Paulus W & Blossfeld HP 2007. Schichtspezifische Präferenzen oder sozioökonomisches Entscheidungskalkül? Zur Rolle elterlicher Bildungsaspirationen im Entscheidungsprozess beim Übergang von der Grundschule in die Sekundarstufe. [Social class-specific preferences or socioeconomic decision calculations?]. Zeitschrift für Pädagogik 53 (4), 491–508.

Punjabi S 2020. Is Shadow Education Becoming the 'New'Formal? Effects of Pedagogical Approaches of IIT-JEE Coaching on School Education in the City of Delhi. *Contemporary Education Dialogue*, 17(1), 14-44. DOI: 10.1177/0973184919885485

Salili F 2005. Accepting personal responsibility for learning. In D A Watkins & J B Biggs (eds). *The Chinese learner: Cultural, psychological and contextual influences*. Hong Kong, Korea: Comparative Education Research Centre, The University of Hong Kong.

Schacter J 2000. Does Individual Tutoring Produce Optimal Learning? *American Educational Research Journal*, 37(3):801–829. https://doi.org/10.3102/00028312037003801

Silova I, Budiene V & Bray M 2006. *Education in a hidden marketplace: Monitoring private tutoring*. New York, USA: Open Society Institute.

Silova I 2010. Private tutoring in Eastern Europe and Central Asia: Policy choices and implications. *Compare*, 40(3):327-344. https://doi.org/10.1080/03057920903361926

Stecher L Maschke S & Preis N 2018. Extended Education in a Learning Society. In N Kahnwald & V Täubig (eds). *Informelles Lernen: Standortbestimmungen*. Wiesbaden, Germany: Springer VS.

Stevenson DL & Baker DP 1992. Shadow education and allocation in formal schooling: Transition to university in Japan. *American Journal of Sociology*, 97(6), 1639-1657.

Stüber H 2016. Qualifikation zahlt sich aus [Qualification pays]. IAB-Kurzbericht 17, 1–8. http://doku.iab.de/kurzber/2016/kb1716.pdf.

Sujatha K & Rani G 2011. Private tuition at secondary level: Trends and troubles. In K Sujatha & G Rani (eds). *Management of secondary education in India*. New Delhi, India: Shipra Publications.

Tansel A & Bircan F 2006. Demand for education in Turkey: A Tobit analysis of private tutoring expenditures. *Economics of Education Review*, 25(3):303–313. https://doi.org/10.1016/j.econedurev.2005.02.003

Varian HR 2010. *Intermediate Microeconomics: A Modern Approach*. 8th ed. New York, USA: W.W. Norton & Company.

Watkins DA & van Aalst J 2014. Comparing ways of learning. In M Bray, B Adamson & M Mason (eds). *Comparative education research: Approaches and methods*. Hong Kong, Korea: Comparative Education Research Centre, The University of Hong Kong/Dordrecht, Netherlands: Springer.

Xue H & Ding X 2009. A Study on Additional Instruction for Students in Cities and Towns in China. *Educational Research*, 30(1):39-46.

Zhang W & Bray M 2015. Shadow education in Chongqing, China: Factors underlying demand and policy implications. *KEDI Journal of Educational Policy*, 12(1):83-106.

Zhang Y 2013. Does private tutoring improve students' National College Entrance Exam performance?—A case study from Jinan, China. *Economics of Education, Review*, 32:1-28. https://doi.org/10.1016/j.econedurev.2012.09.008

Zhang W & Bray M 2018. Equalising schooling, unequalising private supplementary tutoring: Access and tracking through shadow education in Shanghai, China. *Oxford Review of Education*, 44: 221–238.