

# 1 The Effects of Mothers' Profession on their Children's Academic 2 Performance: An Econometric Analysis

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## 7 **Abstract**

8 This study focused on school going children's educational performances of working  
9 nonworking mothers. Factors including parents' highest level of education and their  
10 profession, family income, family size and the number of school-going siblings in the family  
11 were considered as the explanatory variables of educational performances. Based on the  
12 primary data collected through a random sample survey of the students from two schools in  
13 Chittagong University campus and applying the regression analysis of the ANCOVA model,  
14 this study found that mothers' level of education and family income have a significantly  
15 positive impact on students' academic performances though the mothers' employment status  
16 has a negative impact except those who are employed in teaching profession. Thus, this study  
17 suggests that the ideal profession for mothers is teaching which plays a vital role on their  
18 children's educational performances than the other professional mothers.

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20 **Index terms**— academic performance, school children, working mothers, ancova model.

## 21 **1 Introduction**

22 students' academic achievement plays an important role in producing the best quality graduates who will become  
23 the great leaders and the efficient workforce of a country in the future and thus be responsible for the country's  
24 socio-economic development (Ali, et al, 2009). Over the recent few years, in Bangladesh, literacy rate and  
25 the level of education have improved remarkably and hence most of the educational institutions are improving  
26 in educational quality and creating skilled persons meeting dynamically growing market requirements. This is  
27 almost 46% according to a World Bank report. That is a reason a researcher finds out the factors affecting the  
28 students' academic performance, especially in the primary level where students are so much naive that they do  
29 not realize what the goal of their study is, and the primary level education is thought to be the foundation of  
30 higher studies.

31 In the past, most of the studies were related with students' academic performance conducting issues like gender  
32 difference, teachers' education and teaching style, class environment, socio-economic factors and educational  
33 background of the students' families. The findings of these studies differ significantly from region to region,  
34 country to county as well as cities to rural areas. Unlike the previous studies, this paper investigates the effects  
35 of mothers' profession on their school children's academic performance through the econometric analysis. For  
36 this purpose, it would be better if the study could be conducted for all school children of the country or at least  
37 all students of Chittagong city at the primary level. But for time and cost consideration it is not so easy for  
38 the author and hence only the students of the primary section of Chittagong University Laboratory School and  
39 Nipobon Shishu Biddyaloy were taken as the population.

## 40 **2 a) Significance of the Study**

41 A woman has multi-dimensional contributions in a family that affect the happiness of all family members. In  
42 almost all societies in the world, they are traditionally assigned to be the primary caregivers to infants and children

## 5 LITERATURE REVIEW

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43 ??UNDP, 1995). Activities carried out by women such as breast feeding, preparing food and drinks, bringing  
44 water and collecting fuel, and seeking preventative and curative medical care are crucial for children's healthy  
45 development. Women also play their roles to supplement family incomes in households as well as in businesses.  
46 In developing countries like Bangladesh this participation of women is quite essential in some cases for minimum  
47 survival of a family. Because of constraints in time that women face, however, their roles as caregivers and  
48 providers of family income may conflict with one another, with potentially important implications for the welfare  
49 of children. Working may rely on other members of the household to provide child care, but the quality of  
50 care provided by these substitutes, especially if they are older children, may be poor. On the other hand, the  
51 additions of family income from mothers' employment should benefit children's tuition fees, purchasing academic  
52 accessories etc. and may more than compensate for any reductions in the quantity or quality of care, implying  
53 a net improvement in academic outcomes as a result of maternal work. This will be more likely if women have  
54 strong preferences for spending their income in ways that benefit their children's education, especially if women  
55 have stronger preferences for educating their children. But again the effect may be positive or negative. So the  
56 significance of this study will be to determine whether mothers' profession particularly teaching is positively or  
57 negatively correlated with children's educational outcomes. Thus, the paper aims at showing whether mothers'  
58 profession has any statistically significant influence upon the school children's academic result or not as it is not  
59 necessary to mention that in our country it is believed that if a mother goes to work outside the household, her  
60 children may be affected in nutritional intake and hence a diverse effect on their education.

### 61 3 b) Research Topic

62 The research papers over the last twenty to forty years show that the mothers' employment status is not so  
63 robust a variable that the simple comparison of the children of employed and non-employed mothers will reveal  
64 meaningful differences. In this case, relationships must be examined with attention to other variables that  
65 moderate important effects particularly social class, the parents' attitudes, income, gender, number of siblings,  
66 nature of the location etc. Obviously, these effects are different in the middle class than in the lower class and  
67 different for boys than girls.

68 In addition, however, the path between the mothers' employment status and children's outcomes is a long one  
69 and there are many steps in between. To understand how maternal employment affects the children's academic  
70 performance we have to understand how it affects the family because it is through the family that effects take  
71 place. In many researches, it was indicated that the particular aspects of the family that are affected by the  
72 mothers' employment status and in turn, that affect the children, are the fathers' contributions, the mothers'  
73 sense of wellbeing and the parenting style -that is, how they interact with their children and the goals they hold  
74 for them.

### 75 4 c) Objectives of the Study

76 The main objective of this paper is to explore the impact of mothers' occupation that influences the academic  
77 performance of primary school students. In this case, the main explanatory variable is mothers' profession.  
78 Besides, some control variables are taken as the influencing factors. However, the specific objectives are as  
79 follows: a) To estimate the variability in students' educational outcomes; b) To test whether mothers' profession  
80 and their level of education significantly affect the kids' scores in the final examination; c) To make policy  
81 recommendations for the society on the basis of empirical findings of the paper.

82 II.

## 83 5 Literature Review

84 Previously a lot of researches have been done on this issue abroad. Many researchers investigated on various  
85 variables and a lot of different variables were studied. This research is different in a way that it is, probably,  
86 one of the first researches in Bangladesh, for ought the authors' knowledge goes, in which a variable "mothers'  
87 profession" is included to study the variation in school children's educational outcomes in the primary level.  
88 Our contribution to this study is that we have explored the family background factors that affect the students'  
89 academic performance, especially at the primary level.

90 From a child development perspective, mothers face a trade-off between time devoted to parenting and money  
91 deciding on whether to work or not. Both money and time devoted to parenting are believed to have a positive  
92 impact on a child's cognitive as well as academic development. It is therefore relevant to estimate the effect of  
93 maternal employment on children's academic performance. Is it plausible to think that the direction of this effect  
94 changes across countries? Since the socio-economic condition in developing countries is quite different with that  
95 of in developed countries, the research findings of these countries on the issue we have selected are also different  
96 as they have modern and sophisticated daycare centers, pre-play schools and improved medical care system etc.

97 Ibn Mafiz et al (2012) conducted a crosssection study to investigate the effects of socioeconomic, demographic  
98 and internet exposure factors on school performance among 10 grade students of Nilkhet High School, Dhaka. In  
99 this study, school performance was measured by the students' class roll number. Class roll numbers were found  
100 highly negatively correlated with the factors like family income, monthly tuition fees, number of rooms in the  
101 house, number of earning persons in the family, and this correlation was significant at 1% level. A chi-square

102 test was carried out to check for association between the category of these factors and the school performance  
103 measured by grades. In the chi-square test, some of the factors, namely, parents' highest level of education and  
104 their occupation were statistically significant. This study also found that the school performance measured by  
105 students' grades was significantly correlated with the work on internet and the number of friends in Facebook as  
106 well.

107 Raychowdhuri et al (2010) have shown that it was assumed that mothers' education is positively related to the  
108 academic performance of the students. An educated as well as working mother can take better care be significant.  
109 It shows that there is statistically and significantly positive relationship between students' academic performance  
110 and mothers' education and profession.

111 Singh, P. (India) said in an investigation that the days are now over when mothers devoted their full life for  
112 developing their children. Today, women are becoming more active, independent and prefer progress in their  
113 career rather than been recognized as just homemakers. Career-oriented women continue their work soon after  
114 completion of their maternity leave. Many working women start the job early due to financial needs of their  
115 family. There can be different reasons for women to go to work instead of staying at home. Dunifon et al (2010)  
116 in Denmark associates children's well-being with their academic performance and achievement in school and  
117 estimate the causal effect of maternal employment on children's educational outcomes. The study used detailed  
118 Danish data on over 125,000 children born between 1987 and 1992. In two out of three model specifications they  
119 found a significantly positive correlation maternal employment and children's school grade. The paper suggests  
120 that a child of a woman who works 30 or more hours per week while her child was under the age of four is  
121 predicted to have a GPA that is 5.6% on the average higher than a child whose mother works between 10 to  
122 19 hours per week. They found no clear evidence of a negative association between maternal employment and  
123 children's grades.

124 Hoffman, L.W. (1998) shows that full-time employed mothers spend less time with their infants than part-  
125 time and non-employed mothers, but this effect diminishes with maternal education and with the age of the  
126 child. In addition, the effect is also less when the nature of the interaction is considered. The data indicate  
127 that employed mothers tend to compensate for their absence in the proportion of direct interaction and in the  
128 amount of time with the child during non-work hours and on weekends. Several studies that used behavioral  
129 observations of mother-infant interaction showed that employed mothers were more highly interactive with their  
130 infants, particularly with respect to verbal stimulation. Some studies have examined the mothers' sensitivity in  
131 interactions with their infants and found no difference between the employed and nonemployed mothers.

132 A particularly active area of maternal employment research since 1980 has involved a comparison of dual-  
133 wage and single-wage families with respect to mother-infant attachment. In most of these studies, no significant  
134 differences were found. However, in a research by Jay Belsky, it was found that although the majority of mother-  
135 infant attachments in the full-time employed-mother group were secured, the number of insecure attachments  
136 was higher when the mothers were employed on a full-time basis. Furthermore, in reviews that combined subjects  
137 across studies, full-time employed mothers were more likely than part-time employed and non-employed mothers  
138 to have insecurely attached infants.

139 Evidence based on longitudinal data from the United Kingdom and the United States of America generally  
140 suggests that full time maternal employment during the first year of a child's life is associated with poorer child  
141 outcomes, especially poorer cognitive outcomes. Once their kids are old enough to go to school, many parents  
142 depend on class teachers to help them learn crucial academic and life skills. And the media hype around the hiring  
143 of better and more qualified teachers in public schools conventionally broadcast the idea that a great teacher can  
144 make or break a student's school achievement. But the great classroom teachers are not so. Parents continue to  
145 play an important role in their children's education. ??rndt, B. (2000), writes that the great irony of mothers  
146 who achieve professional success is that they do so at some costs to their children. But O'Brien can hardly have  
147 expected the venom she received when her research became the focus of a BBC Panorama Program entitled  
148 "Missing Mums", which claimed that British mothers were jeopardizing their children's future by working long  
149 hours.

150 An Australian research report on child care hit the news, promoting headlines about the risks of informal care  
151 for children. But hidden within the federal government report was the startling finding that children in full-time  
152 child care in the first two years of their lives were rated by their early primary school teachers as being less  
153 effective learners than their peers. There were no consistent effects of the mothers' employment on any aspect of  
154 child development. (US Equal Opportunities Commission ??eport, 1990).

155 An analysis of six studies looking at 40,000 children over the last 40 years found that there was no link between  
156 mothers' continuing their careers and misbehaving. Studies have shown that children born to career-oriented  
157 mothers in the seventies to early nineties of the last century did not perform as well with their literacy and  
158 numeracy skills about two percent lower. But the latest research by Joshi, H. of the University of London Centre  
159 for Longitudinal Studies found that children born since the mid-nineties whose mothers work their early years  
160 fared just as well as those whose mothers did not.

### 161 6 III.

### 162 7 Methodology

163 In our study, a typical student's educational outcome measured in terms of his or her scores obtained in the  
164 last final examination is assumed to depend on several factors including family income, family size, number of  
165 school going children in a family, parent's highest level of education, parent's profession and whether the family a  
166 student belongs to owns a home or lives in a rental house etc. To explore the effects of these factors on students'  
167 school performance we have used a cross-section, the primary data collected from the study area comprising  
168 of Chittagong University Laboratory School and Nipobon Shishu Biddyaloy. The population size of these two  
169 schools consists of more than five hundred students. But we have surveyed only the of class four and five and  
170 only 51 students were sampled among them. Obviously, this sample size is not sufficiently enough to investigate  
171 the variation in the children's educational outcome due to mainly whether the mother of a child is employed or  
172 a full time homemaker. But because of time limitation and cost consideration we have to rely upon this size of  
173 the sample for the study.

174 This study used questionnaires as the sole research instruments. These questionnaires were used to collect  
175 data from the pupils. However, the students spontaneously responded to answer all the questions and the school  
176 authority helped us seriously. The authors provided sufficient help to the students to fill out the questionnaires  
177 and in some cases especially to know the information about the respective families' income we have had contact  
178 with the parents of some students. However, a simple random sampling technique was used to sample the required  
179 data of 51 students as the sampling procedure in this study.

180 IV.

### 181 8 Analysis of Data and Descriptive Statistics

182 For the analysis of data we have used Microsoft Excel 2007 and econometric software E-Views 7.0. As the  
183 econometric methodology, we have used the multivariate classical linear regression model (CLRM) since the  
184 dependent variable (students' educational outcomes measured as marks obtained) is a quantitative variable.  
185 Besides, there are some qualitative variables as well.

186 After having 51 observations regarding the students' academic result and the factors affecting this result,  
187 we have calculated descriptive statistics of all the variables such as minimum and maximum scores of sampled  
188 students, and mean, median, standard deviation, skewness and kurtosis are shown in Table 1 There are a total  
189 of 51 students in our survey and a student has an average score of 448.58 out of 650 with a minimum score of  
190 245 and a maximum of 619. The distribution of marks obtained by all students is negatively skewed to the left  
191 which indicates that average and median score lie below the modal score. A kurtosis of 1.71 implies that this  
192 distribution is a platykurtic frequency distribution. We have surveyed children of various income families with  
193 income ranges from 5,000 to 100,000 BDT where the average income of a family a student comes of is 35,333  
194 BDT per month. There are two types of family in the survey -single and joint and families included in our study  
195 have members from two to nine.

196 On the other hand, among the dummy (qualitative) explanatory variables, the mothers of most of the students  
197 have master's degree or above but only 41% mothers are employed on a full-time basis. Of course, 57% of employed  
198 mothers are teachers. This is our investigation that whether mothers' profession, especially if mothers are teachers  
199 at some educational institutions does have any positive contribution in improving children's quality or not.

200 V.

### 201 9 Empirical Model Specification

202 In our study, we have used the following empirical model to measure the effects of mothers' profession on students'  
203 educational outcome:) , , , , ( 5 4 3 2 3 2 D D D D X X f Y =

204 where, Y = Educational outcome of a student measured in terms of marks obtained in the last final or half-  
205 yearly examination; X 2 = Income of the family a student belongs to; X 3 = Size of a student's family; D 2 =  
206 Mother's education which is a binary variable. In this case, the mother's highest level of education is categorized  
207 into four -S.S.C., H.S.C., Graduate and Post-Graduate. To define the level of education of a typical mother D 2  
208 = 4 indicates that the mother's highest level of education is master's or above, D 2 = 3 indicates the mother is  
209 a graduate and D 2 = 2 and 1 were used for tracing a mother who has only higher secondary or secondary level  
210 education respectively. There are some zeros in our data sheet indicating that the mother's education is below  
211 the secondary level. D 3 = Mother's profession which has two conditionswhether the mother is in service or a  
212 full time housewife. For an employed mother this dummy variable takes one and for a non-employed mother it  
213 takes a value of zero. D 4 = Teaching profession. If the mother of a student is in service, we tried to trace out  
214 whether she is engaged in teaching profession or not and conventionally a D 4 = 1 introduces us a mother of  
215 teaching profession and a D 4 = 0 implies otherwise.i i i i i i u D D D D X X Y + + + + + = 5 5 4 4 3  
216 3 2 2 3 3 2 2 1 ? ? ? ? ? ? ?

217 Since there are quantitative as well as qualitative explanatory variables in the model, we are dealing with an  
218 analysis of covariance (ANCOVA) model. The ANCOVA models are an extension of ANOVA models in the sense

219 that they provide a method of statistically controlling the effects of quantitative regressors, called covariates or  
220 control variables, in a model that includes both the quantitative and dummy regressors.

## 221 **10 VI.**

## 222 **11 Empirical Findings and Interpretation of Results**

223 Since ANOVA or ANCOVA models do not violate the assumptions of the so-called classical linear regression  
224 model, the ordinary least-squares method is quite fit to run the regression results and hence based on the above  
225 mentioned ANCOVA model, we have estimated the following empirical results: The sample regression line of the  
226 model is as follows: The intercept (392.0007) of the regression indicates the average effects of all those factors not  
227 included in the model but are responsible for the variation in a student's academic result e.g. type and location  
228 of the school, availability of recreational facilities, motivation of students and so many other factors.i i i i i i D  
229 D D D X X Y 5 4

230 ii)  $2 \beta = 0.001824$  suggests that ceteris paribus, as the income of the family a typical student belongs to goes  
231 up by one thousand taka per month a student is expected to improve his or her numerical grade on an average  
232 by 1.82 out of 650 in the next examination. In this case, the sign of the estimated slope coefficient is important  
233 not the magnitudes.

234 Since the t-ratio of this coefficient is statistically significant we can conclude here that the child of a wealthier  
235 family will do better than a child of a relatively less wealthy family. This scenario is practically true because the  
236 children of richer families will enjoy so many advantages in favor of better education that the children of poorer  
237 families can never expect, such as the number of tutors, the purchasing power of required number of textbooks  
238 and other reading materials, access to internet and television facilities, food and nutrition intake, school dresses  
239 and other educational equipments to build up confidence of a student, family environment, partial dependence  
240 on the children to provide financial supports to poorer families and so on.

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244 Finally, a D 5 = 1 if a family the respective student belongs to owns a house and a D 5 = 0 if it does not.

245 Considering these factors we have specified the following functional form of regression of educational outcome  
246 on the family background factors mentioned above:

247 iii)  $3 \beta = -6.716305$  indicates that if the size of a family increases a student's average academic scores will be  
248 lower by approximately 7 out of 650 which is not so significant as the t-ratio of this coefficient is smaller than  
249 two in absolute sense. In this respect, our statement is that it may happen because if the member of a family  
250 increases in number over time a student will not get enough room facilities for a sound study. Furthermore, if  
251 the income of a family will not rise proportionately with the number of family members it will be very difficult to  
252 provide sufficient financial backup for school-going children. Now let us interpret the dummy variable coefficients:  
253 iv)  $2 \beta = 20.27946$  was found to be significant at 8 percent level. This means that the child of a mother whose  
254 highest level of education is S.S.C. or above can achieve on an average of 20 more marks out of 650 from a child of  
255 an uneducated mother. This result we expected seriously and we have obtained as our a priori expectation. An  
256 educated mother can put strong cognitive power in her kids which is the foundation for their better performance  
257 in schools. A highly educated mom can teach better than a house tutor as well as ameliorated social culture  
258 that an uneducated or less educated mother cannot do. v)  $3 \beta = -55.95592$  measures the average effects of  
259 a mother's profession on educational outcome of a typical student. As the estimated coefficient is found, it  
260 indicates if a mother is employed, her child will get about 56 marks less than a child whose mother is a full time  
261 homemaker, though the coefficient is found to be insignificant. vi) Records across countries as we have described  
262 in the literature review show that there is significantly positive relationship between mothers' profession and  
263 school students' academic performance. But we did not get this result in our study. There are several reasons  
264 behind this insignificant result such as a) We have selected only two schools as the population. If the data can  
265 be collected from more schools from rural and metropolitan areas more significant correlation between mothers'  
266 profession and school students' academic performance could be obtained. b) In our country, especially in city  
267 areas when a mother is absent from the family due to her job, there are no responsible persons to take care of  
268 the children so that their nutritional intake remains ignored and consequently it will have a diverse impact of the  
269 children's education.

## 270 **12 vii)**

271  $4 \beta = 89.07502$  implies that controlling on family income and family size as well as other dummy variables the  
272 child of an employed mother who is a teacher achieves significantly better score than a child without having it.  
273 This is the result we wish to find out from our study. The children of employed mothers can perform worse but  
274 if the mothers are in teaching profession it will positively influence a child to do better performance. The causes  
275 behind this may be as follows: a) A mother in teaching profession can better take care of her child regarding  
276 home works than any other mothers. b) The child of a mother of this profession will be more disciplined. c) The  
277 mother who is a teacher might be the 'IDOL' of her children so that they can try to do better.

278       viii)  $5 \beta = -52.63608$  is another estimated coefficient which has an a priori wrong sign that a student who lives  
279 in own house do not perform better. This finding could also be altered in a large size of sample from different  
280 schools.

281       VII. Testing the Goodness-of-Fit and Overall Significance

282       In our model, the coefficient of determination  $R^2$  is found to be 0.4318 which indicates that explanatory  
283 variables altogether can account for only 43% variation of school students' academic result through the factors  
284 we have considered in our study. Thus, the estimated regression line fits the data moderately. Furthermore, the  
285 adjusted  $R^2$  is also moderate. Obviously, this is not a high  $R^2$  value that we can conclude that we have trace  
286 out the correct set of explanatory variables related with the variability of school students' educational outcome.  
287 But this is not so surprising result in a cross-section study.

288       Though the t-ratios of one or more individual coefficients are statistically insignificant which has been explained  
289 earlier, the F-statistic ( $= 5.57$ ) is highly significant which does imply that though we cannot disentangle the  
290 separate influence of some factors on the marks obtained by the students, we can reject the null hypothesis that  
291 family income, family size, mothers' education and profession have statistically significant overall influences on  
292 the children's educational outcome.

### 293 13 VIII. Diagnostic Testing of the Model

294       Let us now perform some diagnostic tests on the estimated ANCOVA regression model: In our Analysis-  
295 of-Covariance regression model, the minimum and maximum eigen values were obtained as 0.020 and 5.032  
296 respectively for which the condition index appears to be 15.86 as defined by the positive square root of the ratio  
297 of the maximum eigen value to the minimum. Since this index lies in between 10 to 30, we are sure to assert  
298 that the explanatory variables are not highly correlated to one another. Another symptom of high collinearity is  
299 that  $R^2$  will be high but one or more t-ratios will be insignificant, which is not the case in our model. For this  
300 diagnostic test, we have used SPSS 17.0.  $\beta$  as some function of non-stochastic variables, the BPG test defines a  
301 chi-square ratio on the basis of the explained sum of squares (ESS) which has an F-statistic and it was found to  
302 be 0.54 as shown in Table 3. Since this F value is statistically insignificant we can reject the null hypothesis that  
303 error variances are heteroskedastic.

### 304 14 d) Testing Autocorrelation: Durbin-Watson Method

305       The model has no serial correlation, that is, successive disturbances do not show any significant patterns. In our  
306 study, the estimated Durbin-Watson statistic was found to be 1.74 which is lower than 2.0 but greater than the  
307 upper critical d value at one percent level of significance. Thus, we cannot reject the null hypothesis that there is  
308 no autocorrelation between errors. This result is highly expected in a cross-section study where the error terms  
309 are usually uncorrelated to one another.

### 310 15 e) Ramsey's RESET Test of Model Misspecification

311       Let us now check whether we have chosen the correct model to explain the variability of students' academic  
312 performance in the final examination in our study. Ramsey, J.B. has proposed a general test of specification  
313 error called RESET (Regression Specification Error Test) to detect omitted or irrelevant variables, to trace out  
314 incorrect functional form or a model that violates the assumptions of the classical linear regression model. For  
315 this purpose, first we have to calculate the predicted values of the dependent variable Y and then estimate an  
316 artificial model by including some polynomial of the fitted term  $Y^\beta$  as additional explanatory variables. If we  
317 can reject the null hypothesis that the coefficients of the fitted terms are significantly different from zero, we may  
318 encounter the problem of specification error. A failure to reject the  $H_0$  will indicate that the model is not able  
319 to detect any kind of specification error.

320       In this respect, the E-Views output shows that the F-ratio (2.50) of the RESET test was found to be significant  
321 at 12% level, which indicates that the null

## 322 16 Conclusion and Policy Recommendation

323       The study attempts to estimate the educational achievement of school students on the basis of some family  
324 background factors and for this purpose we have used the ANCOVA model where some factors were found to  
325 be significant and some are insignificant. A survey of a few students might be one of causes of finding some  
326 insignificant coefficients which is a limitation of our study. Furthermore, only two schools were selected as the  
327 population. It would be better to select more schools in the population. But the authors have to rely on a small  
328 size of sample due time and cost considerations.

329       However, the most important conclusion to be drawn from the analysis presented here is that whether a  
330 mother's employment status has a positive or a negative effect on school-aged children's educational outcome is  
331 entirely based on the nature of mother's job. The issue, therefore, is not whether the mother works, but what the  
332 level of her paid job is: if she has a laboring job, her work outside the home has a negative effect on her children's  
333 educational chances. But if she is a teacher in some educational institution, her kids might perform significantly  
334 better than other children and we may recommend a policy for highly educated women who are career-oriented  
335 to choose teaching profession. hypothesis of no model misspecification cannot be rejected at more than 12% level.

336 Obviously, at 12% level of significance, there might be some specification error. According to the author's view,  
337 there may be some psychological factors like the understanding of father and mother, father's education, sex of  
338 the student as well as some institutional aspects such as the nature of the school a typical student is enrolled, the  
339 students' attendance in the class, teacher-student ratio, presence of trained teachers in the school, commuting  
340 time to schools from the students' residence etc. But due to time and cost consideration as we have mentioned  
341 earlier and since some of the factors are quite sensitive to deal with, it is difficult to collect data on all of these  
issues, which might be one of limitations of our study. <sup>1 2 3</sup>

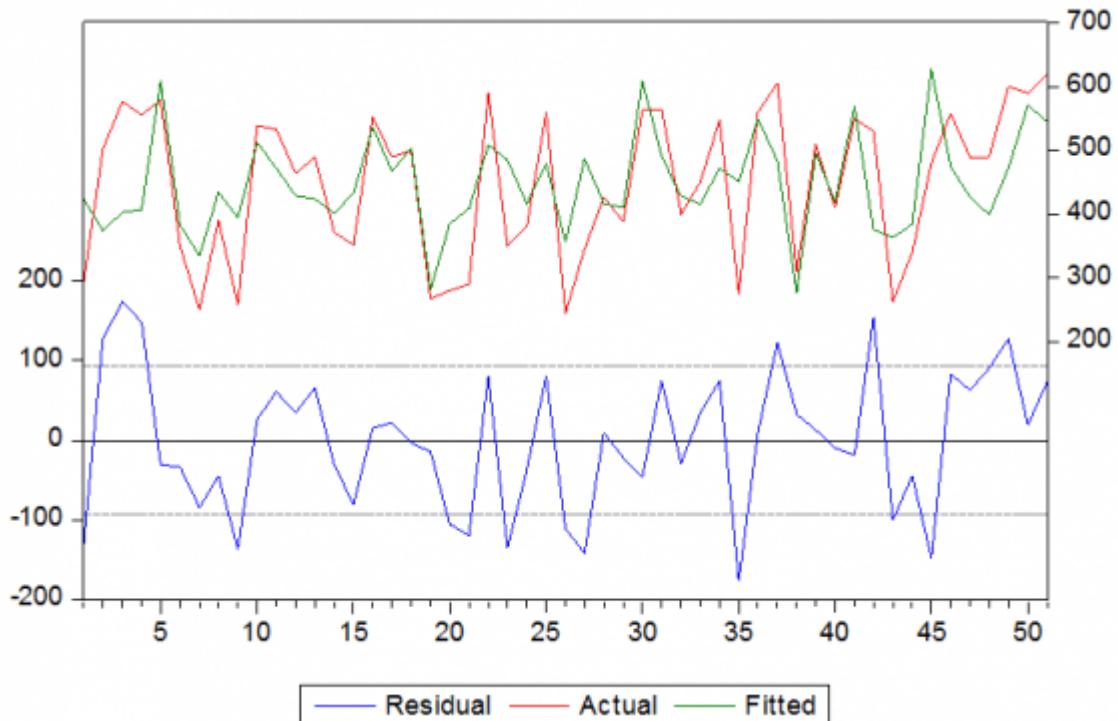


Figure 1:

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## 16 CONCLUSION AND POLICY RECOMMENDATION

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Variables	Outcome (Y)	Educational Family Income (X 2 )	Family Size (X 3 )	Mother's Education (D 2 )	Mother's Profession (D 3 )	Teaching Profession (D 4 )	House Ownership (D 5 )
Mean	448.58	35,333.33	4.76	2.67	0.41	0.26	0.53
Median	490.00	31,000.00	5.00	3.00	0.00	0.00	1.00
Maximum	619.00	100,000.00	9.00	4.00	1.00	1.00	1.00
Minimum	245.00	5,000.00	2.00	0.00	0.00	0.00	0.00
Std. Dev.	116.55	22,742.62	1.21	1.38	0.50	0.43	0.50
Skewness	-0.32	1.08	0.94	-0.49	0.36	1.25	-0.12
Kurtosis	1.71	3.90	5.23	1.88	1.13	2.56	1.01

Figure 2: Table 1 :

2

Dependent Variable: MARKS (Y )

Included observations: 51

Variable	Coefficient	Std. Error	t-Statistic	p-value
C	392.0007	73.57258	5.328082	0.0000
Family Income (X 2 )	0.001824	0.000673	2.709604	0.0096
Family Size (X 3 )	-6.716305	11.75156	-	0.5706
Mother's Education (D 2 )	20.27946	11.29606	1.795269	0.0795
Mother's Profession (D 3 )	-55.95592	36.34112	-	0.1308
Teaching Profession (D 4 )	89.07502	43.86481	2.030671	0.0484
House Ownership (D 5 )	-52.63608	27.72153	-	0.0642
			1.898744	
R 2	0.431778	Adjusted R 2		0.354293
Explained variations	93.65518	Sum of squared residuals		385936.9
F-statistic	5.572412	Prob. (F-statistic)		0.000229
Durbin-Watson statistic	1.747684			

Figure 3: Table 2 :

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### 3

#### c) Testing Heteroskedasticity: BPG Approach

In our model, there is no heteroskedasticity as we expect in cross-section data where disturbances have constant variances. Let us examine this through the Breusch-Pagan-Godfrey (BPG) test. Considering

$2$

$i$

Figure 4: Table 3 :



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