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An Econometric Analysis of Income, Education and Residential Status on Family Education Expenditures

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ABSTRACT

This study assesses family spending on higher education in Pakistan. It researches the components and variables completing the families spending on schooling utilizing information from PSLM data 2018-19. The results derived from estimation depict that change in the level of degrees, income and change in residency concerning across country sets the expenses of family on higher education. Additionally. This analysis considers residency status of the household that too incorporates the family spending on education. This study strictly empathizes residency into account and drawing statistical inferences. Such consequences drawn definitely help and support in policy formation and recommendations. This analysis has definitely established right direction to promote higher education in the country. It has observed all the responsible factors that how family heads react to promote education. Residential status of the households have shared its contribution that how this affects the behavior of the households when they live in the different nature of accommodations with respect to their expenses. It has examined this effect through statistical data. However, this exploration ends that all factor have positive influence in policy recommendations for education. Further, all revelations can have inferential scope of issues concerning educational implications in Pakistan. These all factors have specific role in the determination of the allocation of budget on education from government side. The OLS (ordinary Least Square) Method and Regression analysis technique used to execute the regression. This method and technique signifies to situation when a model has dependent variable as quantitative. Estimates and results will implement the policy and provide a solution for all of the issues that the variables have explained.

Introduction

Education an overview

In any society, education is crucial to its growth and to fostering harmony. As a result, it has consistently drawn the majority of debate in society. Education has a major impact on earning potential or prestige in the workplace and can almost solve financial problems like unemployment and poverty. Education has a crucial part in the creation and upkeep of governmental institutions. The human capital theory states that education increases output and profitability (Walker, 2003; Chevalier et al., 2004). The seminal mechanisms of Becker (1964), Mincer (1974) and Lucas (1988) shaped economic theory regarding how obtaining an education raises personal income and influences the economy's long-term outlook. Results from observations support the idea that education could be used to reallocate money and reduce poverty (Stiglitz 1974; Behrman et al., 1980). Thus, education may continue to be the cornerstone of both economic growth and income equality.

According to Wongmonta and Glewwe (2017) and Yang et al. (2014), educational development is thought to be a crucial element in increasing productivity since it fosters new ideas and inventions, which in turn improve worker efficiency and accelerate economic growth. Investment in human capital, especially in education, is essential for long-term economic growth in order to address the inclusive and exclusive economic difficulties that every nation faces (Evidences, 2011; Gamlath and Lahiri, 2017). The majority of nations have made sure that there are educational facilities available, but in many developing nations, there are still unanswered questions about basic facilities because of budgetary constraints, bad management, and a lack of focus from national and local government (Singh and Shastri, 2020).

A momentous portion of Pakistan's residents is currently enrolled in school; 48 percent of the people are between the ages of 5 and 24 (LFS, 2013–14), making up a significant portion of the population who are already in school. This populace can be converted into a segment profit by putting resources into education and capabilities improvement. In addition, Pakistan has a demographic share likely for monetary growth since the proportion of its total population that is working age is growing and is expected to continue growing till 2040.. It is understood that Pakistan's macroeconomic performance could be affected in the future by this pattern of demographic change. Additionally, the China-Pakistan Economic Corridor, or CPEC, will soon be operational. Therefore, investing in education is necessary to increase the workforce's education and skills in order to benefit from the demographic dividend.

The public capitalizes two ways in schooling, organization level and family level. In the circumstance of Pakistan, there is a realistic amount of evidence about how much money the government spends on education, but there is not much information about how much money households spend on education. Public and private sector expenditures are equally significant. Because the presence or absence of either one indicates a suboptimal allocation of resources and investments made by households and by, the government are interconnected and dependent on one another. As a result, ignoring education expenditures by households is costly because a lack of information leads to incorrect assumptions regarding households' willingness to pay for education. National educational policies are less effective because of these flawed assumptions. Consequently, it is crucial to examine and evaluate the mandate for education in Pakistan and the willingness of households to pay for it.

The goal line of this learning is to search out how different socioeconomic factors affect how much money is spent on education at the household level in Pakistan. A double logarithmic specification

of the Engel Curve has been used in this study to evaluate the relationship between education expenses and their elements. Attention of household in education is assessed by the family's spending on schooling. Instead of focusing on factors that influence educational attainment as did previous studies (Ahmed et al., 2013). The study focuses on the elements that influence education spending at the household level. Educational achievement is likewise a purpose of individual features of the kids in addition to the features of the household, so it somewhat enlightens the outlay in or petition for edification by families. Expenditure on education reflects households' readiness to recompense for their kids' education. Second, researcher examined whether household budgets and income elasticity of demand for education in Pakistan change with income level to trial the hypothesis that schooling is an essential worthy.

Background of the Study

The current study is associated to the factors that influence household outlay on higher schooling. Much researcher has prior done work on education but no one has clearly attempted to segregate education expenditure on higher education. However, the scholar has attempted to find out the elements that influence family expenses on higher learning from graduation to a doctorate. It will surely help researchers to quantify household expenditures on higher schooling gradations.

Problem statement

The current study is connected to the features that effect household expenditure on higher education. However, the scholar has attempted to determine the elements that influence family expenses on advanced or higher education from graduation to a doctorate. It involves bachelor's degrees (B.A., B.Sc., and B.Ed.), master's degrees (M.A., M.Sc., and M.Ed.), degrees in engineering, medicine, agriculture, and law, M.Phil., Ph.D and other degrees also. According to a review of the literature, numerous researchers have not yet examined this kind of expenditure on higher education with such variables and degree types. It will really help researchers quantify household expenditures on higher education degrees.

Objectives of the study

1. To estimate the factors of family expenditure on higher education.
2. To quantify extent of family expenses on higher education in Pakistan.
3. To practice such figures and realistic findings for strategy implications regarding higher education of Pakistan.

Review of Literature

Kuvat and Kizilgöl (2020) investigated personal family education spending utilizing information from the Turkey family financial plan overview 2017. The information showed that family pay, family head education level, and individual home are the main indicators of education spending. The qualities affect family education expenditure. Family size increments and lesser admittance to attain education are both connected to diminish family personal spending.

Chandrasekhar, Rani and Sahoo (2019) concentrated on the expenditure n advanced education by utilizing information from the two late Public Example Study Office overviews. The Researcher s assessed that families picking advanced education burn through 15.3 percent of their complete expenditure in provincial regions; and 18.4 percent in metropolitan regions. The Researcher further assessed that the offer was bigger in southern states as individuals from south were bound to concentrate on specialized schooling in confidential foundations and accordingly likewise had additional exceptional borrowings. The Researcher s dissected that more unfortunate Indian

families were less inclined to get advance for advanced education as they were risk-averter and dubious about future returns.

Datta and Kingdon, (2019) concentrated on the orientation predisposition in designation of assets on education in country India from 1995 to 2014. The Researcher s assessed that as opposed to falling; the methods of orientation inclination are changed emphatically over the review period. The Researcher s recognized two likely channels of orientation inclination, school enrolment choice, and contingent education expenditure. The Researcher featured that orientation predisposition in the enrolment choice had decreased however orientation inclination in the expenditure on education had altogether expanded. The Researcher s focused on that singular level information was more helpful in recognition of orientation predisposition when contrasted with family level information.

Jana and Maiti (2019) broke down state-wise uniqueness in open expenditure on advanced education in Indian states. According to the study, budgetary distributions for higher education in India have decreased to less than 1% of the country's gross domestic product since 1991, following economic reform. The versatility of advanced education use to net state homegrown item in numerous Indian states is not as much as solidarity.

Jenkins, Amala Anyabolu, and Bahramian, (2019) inspected the determinants of education expenditures of Nigerian families. The Researcher used board information of Nigerian General Family Overview 2012-2013 and twofold obstacle model was utilized for examination. The Researcher s assessed that family pay, age, schooling, orientation of the family heads, and home altogether influence the spending on instruction. The Researcher s further assessed that these expenditures were pay versatile and contrasted for low pay to higher pay families.

Methodology

Data Range and Data Source

This investigation is grounded on examination of Pakistani households to find out how much each household spends on higher education. The Pakistan Social and Living Standard Measurement (PSLM) Assessment Round -VII 2018-2019 provided the data for this analysis. The informational collection comprises of the multitude of four areas of Pakistan (Khyber Pakhtunkhw, Punjab, Sindh and Baluchistan). It is a cross-sectional review with a random sample extent of 2166 people as of all over Pakistan. The statistics from the survey provide information at the household level regarding higher education as well as various socioeconomic variables like the region, income, type of university, distance from home, age and employing position of the household head, province, education of the family head, digit of children, sex of the family head, and so on. Expenditure on education includes the educational expense, Scholastic Charge fixed, Lodging and transport charges.

Research Design

The equation is assessed using the Linear Regression and Ordinary Least Squares (OLS) methods. The kind of dependent Variables determines the estimation method. The OLS Method and the regression analysis method are carried out because the dependent variable in this case is quantitative. Because this research has dependent variable that is quantitative or scale in nature, so author has applied the above discussed methods and techniques.

There can be no doubt that the regression analysis was used to estimate the model. The estimated model will provide all of the explanatory variables' measurable statistics and reliability. A variable

is statistically significant if its probability or P value is less than 5%, 0.05, or 10% 0.10, while a variable is statistically insignificant if it is greater than 5% or 10%.

Econometric Model

Forming the model's shape and specifying its variables are essential before beginning the estimation and data analysis. The Model provides the foundation and estimation methods by demonstrating the variety and nature of variables. The form of this Multiple Linear Regression Model is as shadows:

Education Expenditure = C + B_1 (Education Level (Degrees) + B_2 (Total income of the family heads) + B_3 Residential status of the family head+ error term

Y	=	Education Expenditure
Constant	=	C
X_1	=	Education Level (Degrees)
X_2	=	Total income of the family heads
X_3	=	Residential status of the family head
e	=	Error Term

In addition, this model must explain categorical variables that will occur during the course of the regression. For instance, income is the first variable in the above form. It is a quantitative variable that will never change, but other variable will be recoded into single variables to form a single categorical variable. Scholar has aligned all categorical variables into their new variables, which will clear the model's results and make it much easier to comprehend the model's regression and actual shape.

Results and Discussions

Model Estimation Results

This section signified the overall result of model by indicating the level of significance as five percent(5 %) and ten (10%) with values of T –statistic, P value and standard errors as well. It will indicate the reliability of variable showing the p values of variable coefficient and if this P values is less than 5 % then that variable is statistically significant and if greater than five percent 5 % then vice versa. Author can see all upstairs-discussed narrative in below tables. This table will just indicate reliability of variable and their numeric values will be calculated through Compare Means technique derived from SPSS (Statistical Package for Social Sciences.) The reason is that most of variable are qualitative in nature and unit for measurement of variable is in rupees as it is household expenditure or outlay on higher education in Pakistan comprising four provinces in the current studies.

Model Summary

Table 4.1: Model Summary

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	0.516	0.266	0.255	84675.6886

Source: Researcher's own contribution, PSLM 2018-19

This Table 4.1 represents the value of R square and Adjusted R square that explains the variation that how all the explanatory variable explains the variation in dependent variable. It depicts that variation in education expenditure that accounts for all the independent variables in the regression mode. It corresponds that 26.6 % variation in education expenses is explained by the independent variables.

ANOVA Summary

Table 4.2: ANOVA Summary

ANOVA SUMMARY						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig**
1	Regression	5550248752327.473	32	173445273510.234	24.191	0.000
	Residual	15293550803414.492	2133	7169972247.264		
	Total	20843799555741.965	2165			
Dependent Variable: Total Education Expenditure						

Source: Researcher's own contribution, PSLM 2018-19

This summary of Table 4.2 shows the statistic of F test which inclusive depicts the strength and power of all independent variables that how these affect the dependent variable. The probability value of F statistic that is 0.000 which is statistically significant and indicates that the overall regression model is substantial.

Scholar has above discussed the Model Summary and ANOVA Table 4.2, which entirely discusses the performance and credibility the model. Now it is time to discuss and interpret the impact and extent of each variables on education expenditure. It will further clarify that how each variable contributes its shares in schooling outlay. Researcher will plot the compare means and coefficients table in order to understand the essence of this thesis designed in order to understand the aspect of household expenditure on education.

Mulitcolineairty test

Multicollinearity occurs when independent variables in a regression model are highly correlated with each other. This can distort the estimation of coefficients, inflate standard errors, and make the model unreliable.

Variance Inflation Factor (VIF)

What it does: Measures how much the variance of an estimated regression coefficient increases due to multicollinearity.

Rule of thumb: If **VIF > 5** (or more conservatively, **VIF > 10**), it may had a multicollinearity issue. In this case, all the variables have VIF values less than five and ten as well. Such results has been shown in the table below with mentioned values. (**VIF = 1/Tolerance)**.

Table 4.3: Collinearity Index

Variables		**Tolerance**	**VIF**
1	(Constant)		
	Age in Complete Year	0.980	1.021
	Total Income	0.981	1.019
	Owner occupied (self-hired)	0.992	1.008

	On Rent	0.956	1.046
	Subsidized rent	0.974	1.026
	Rent free	0.970	1.031

Heteroscedasticity

In regression analysis, heteroscedasticity refers to a situation where the variance of the residuals (errors) is not constant across all levels of the independent variable(s). The following is the test for the detection of heteroscedasticity.

Breusch-Pagan Test

- **Null hypothesis (H_0)**: Constant variance (homoscedasticity)
- **Alternative (H_1)**: Variance changes with predictors

Interpretation

- **p-value** > 0.05 → Fail to reject H_0 → No heteroscedasticity
- **p-value** ≤ 0.05 → Reject H_0 → Heteroscedasticity detected

Table 4.4: Heteroscedasticity detection

Breusch-Pagan Test for Heteroscedasticity		
Chi-Square	**df**	**Sig.**
4379.454	1	0.170
a. Dependent variable: Education Expenditure		
b. Tests the null hypothesis that the variance of the errors does not depend on the values of the independent variables.		

Source: Researcher's own contribution, PSLM 2018-19

This table shows that P-Value is greater than five percent indicating to accept the null hypothesis. Based on this information, researcher clarifies to state that three is no heteroscedasticity in the data.

Education Mean Expenditure

Table 4.5: Education Mean Expenditure

Mean Expenditure			
Education Degrees	**Mean**	**N**	**Std. Deviation**
BA/B.SC/B.Com	34653.975	726	39661.0743
B.Ed./M.Ed.	48541.127	71	69035.9159
B.A/B.SC/BS/BE	69960.991	454	57551.1260
MA/MSC	54251.555	299	54671.3398
Degree in Medicine (MBBS/BDS/Pharm-D)	242270.561	107	280201.8506
Degree in Agriculture	98307.692	13	127890.3401
Degree in Law	83215.152	33	49761.3751
Degree in Engineering	129034.545	99	94143.7682
Degree in Accountancy	110503.846	26	64332.9432
MPhil	123361.765	34	84433.6067
PHD	202600.000	7	142580.6906
MS	250222.222	9	302608.2566
Other	23196.094	288	48854.2060

Total	63124.772	2166	98120.4415

Source: Researcher's own contribution, PSLM 2018-19

Table 4.5 represents the mean expenditure of each degree bearing by the family or household for attaining education and described in exclusive table in a crystal manner. This spending seems very logical conferring to the nature of a degree and with the behavior of the family head or member.

Estimation Results

Table 4.6: Estimation Result

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**T-Values**	**P-Values**
		B	**Std. Error**	**Beta**		
1	(Constant)	38197.746	7383.474		5.173	0.000
	Total Income	-5460.209	1521.320	0.030	-3.589	0.009
	Owner occupied (self-hired)	13945.988	11825.934	0.022	1.179	0.238
	On Rent	1915.685	1617.316	0.022	1.184	0.236
	Subsidized rent	2763.055	2520.207	0.021	1.096	0.273
	Rent free	-1680.495	2215.447	-0.014	-0.759	0.448

Source: Researcher's own contribution, PSLM 2018-19

If researcher perceives this table systematically by observing the each variable and its strength, then he will be able to discuss it very clearly. Table 4.6 represents the constant value also known as an intercept that indicates an average expenditure of education in case when there is no variable in the model. It means that this may have the probability that if researcher has missed any variable. However, this intercept definitely represents the value or amount of expenditure with strongest probability value of 0.00.

Income of the Household

The next most important factor in the regression model is income that contributes too much for any society and task of the family for the arrangement of payment for education of their children. Researcher has taken the sample of two thousand one hundred and sixty six family members in order to determine the behavior of family heads whether they wished to spend for their children or not. However, it comes into notice that each family head is highly interested to spend on education. Each family head is willing to invest on average 0.030 units or 3% of income if his or her income increase by one unit. This result is statistically very much significant as its probability value is less than 5 % or 0.005. Table shows that its P- Value is 0.009 by indicating highly significant result. Income is considered as key factor or determinant to find out the trends and behavior of the people that how they are committed and engaged for the attainment of higher education.

Residential or Occupancy Status of the Household

Scholar is now in this position to examine this variable statistically and to analyses it with serious dimensions. Table 4.6 responds that one category with maximum number of frequency being kept as base. We will compare all the sub categories with base one by applying the limit of probability values. This paper adheres that people or family heads who live in their houses with the condition self not hired have no difference in term of spending with rest of all the sub categories towards higher education as their probability or P values are greater than five percent or 0.005. It in advance shadows that attitude of the households or family heads dost not consider or make the

type or nature of house as base of the hindrance on the way of education. It makes no difference and exerts no influence on the members of house with respect to their residential or occupancy status.

Conclusion and Policy Implications

Conclusion

Researcher has different sort of schooling degrees on more significant level and revelations showing that family spend to become profoundly educated. Results show different spending on various degrees and it reasons and justifies that families have exactly captivated to contribute for their youngsters. Scholar can likewise highlight the expenditure on advanced education in various level of degrees that begins from graduation to Ph.D level in positive manner. All degrees behave very exactly with respect to their expenditure. The nature of degree aligns very accurate in term of its expense that uplifts the credibility of data taken for study purpose. The mainn determinant of the paper or model is the residential status of the household. It will express its status whether it effects the family head or not. It articulated the story through inferential results that residence creates no hurdles for any family heads to continue or discontinues studies for his or her kids. Nature of place having own, self-hired or not or any type of rent based houses do not put any effect on the mind of families to stop their children for the attainment of higher education. Scholar can also conclude that all the factors taking place in the research have their importance and creditability. No one can deny the prominence or significance of any single variable. Each variable shows its contribution and importance towards higher education. Entire factors have rendered their progress in the determination of family expenditure for their children towards education. It also shows the greatest commitment of the household living in the four province of Pakistan. Family or household heads have very clearly conveyed their message that despite of many issues in marginalized societies, researcher is always willful and committed towards the progress of country by sharing their monetary sacrifice in all respects.

Policy Implication

This section countersigned a few policies and recommendations based on the results of estimation using various methods. Nearly accurate findings have been obtained. Based on the previously discussed and inferred outcomes, it is now time to implicate policy at the higher education level. The issue is how a state or nation may implement higher education policies that will support the education industry and raise household or public living standards. It must highlight how the educational system may support those family members who are less able to afford higher education. In econometric research of household spending on education, scholars have noted how each variable influencing spending can be utilized to inform policy for future improvements in the education sector. Data definitely adheres that spending in all degrees is very symmetric and according to nature of degree attained by the scholars. All families have spent an extremely balanced and legitimate measure of cash on degrees like a four-year certification, a science certificate, a degree in horticulture, etc. However, the government ought to prioritize increasing the number of degrees offered at higher levels so that new information can be retrieved and new discoveries can be researched. It suggests that it needs to include more degrees in the jurisdiction of higher education as results and findings indicate that households are deeply interested to educate their kids. HED (Higher education department) must focus on higher education and ensure the provision of all those requirements with collaboration of government assistance that can enhance the scope of education. Such findings express that income of the household plays an important role in education system of Pakistan. An intensification in income drops the cost of education that ultimately encourages the family heads to perceive the education for their kids. It emphasizes that

state should be responsible for the provision of employment to the people so that they may well participate in promoting their youngsters for better education. Government should adopt the policies to upsurge the income level of people in order to attract them more effectively in right direction. Along these lines, the extent of income spent on higher education in Pakistan's four provinces, family heads integrally boosted for the purpose of degree attainment ad their mood shows that families do so paying little heed to caring expenditures from any source. It further follows that this policy for education is the joint venture of government and people living in the entire Pakistan. Households genuinely devote their share and expect from state to assist more to stimulate this agenda of education.

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