

Econometric study of household economic conditions and financing of higher education in South Asian Countries

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Abstract

The relationship between the economic conditions of the household and financing of higher education in selected countries of Asia like India, Pakistan, Bangladesh, Sri Lanka and Nepal is investigated in this study. The analysis is based on a panel econometric model that examines the effect of socio-economic factors, such as household income, unemployment, poverty rates, remittances, and access to tertiary education, on household spending on higher education. The fixed-effects regression model uses to account for unobserved country-specific heterogeneity and to generate more robust estimates across countries.

Results of the empirical tests show that the income of the households and remittances have a statistically significant impact on financing higher education in a positive way, which means that they play an important role in improving the affordability of higher education. Conversely, increases in unemployment and poverty are linked with decreases in investment in education by households. A comparison across countries reveals Sri Lanka and India have relatively high spending on higher education by the household while Pakistan has relatively low spending. Finally, the study highlights the importance of policy interventions such as financial assistance mechanisms and inclusive education financing strategies that can help ensure equitable access to higher education in South Asia.

Keywords: Higher Education Financing; Household Income; South Asia; Education Expenditure; Socio-economic Development.

1. Introduction

The structure of the financing of higher education in South Asia is also experiencing a dramatic change over the past few decades. There has been a gradual trend from mainly public-funded education systems towards greater reliance on household-based expenditure. The transition has been facilitated by a wide variety of factors, including the rapid growth of private higher education providers, increases in demand for tertiary education, financial pressures on the government, and restricted increases in government spending on education. This places families in a significant financial position to access and reach educational outcomes, which in turn means that family economy is a key factor in accessing and attaining education.

Despite significant progress in enrolments and institutional growth, affordability is a still significant problem in many South Asian countries. The disparities in access to higher education have been further exacerbated by rising tuition fees, rising living costs and inequities in income distribution. Economically disadvantaged students are thus often at a disadvantage to undertake tertiary education and so there are continuing disparities in the formation of human capital.

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In this background, the aim of this study is to investigate the impact of macro-household economic indicators on financing of higher education in some selected South Asian countries such as India, Pakistan, Bangladesh, Sri Lanka and Nepal. The study uses econometric techniques, including a panel data regression method, to measure the impact of various factors—household income, labor force participation, poverty status, remittances and access to higher education—on household spending on higher education. This analytical method allows for a comparative analysis of cross-country differences, and can help to provide empirical support for policy-making to enhance higher education equity and affordability outcomes in the region.

Objectives of the Study

- To examine the prevailing economic factors in the household and their effect on financing higher education in South Asia.
- To build a panel econometric model to explain determinants of household's education expenditure.
- To benchmark the difference in education financing across countries in South Asia.

2. Literature Review

Tilak (2020) studied the effects of privatization and commercialization on higher education finance in India. The study noted that rising expenditure on education has put a heavy burden on the households, especially on the poor. It also highlighted the disparities in expenditure, which can often limit the participation of women in technical and higher education.

Chowdhury (2021), the greatest factor affecting the education expenditure of a household in developing economies is house income. The study shows that there is a consistent relationship between a higher income level and greater investments in education, especially tertiary education. Families with increased financial resources are more likely to invest in their children's education, such as paying tuition fees, educational materials, and fees for associated costs, with the additional resources. With increased financial resources, families are more likely to invest more in their children's education, including tuition fees, educational materials, and fees for associated costs. Moreover, the study points out that the higher income households have better access to private educational institutions and thereby better overall educational opportunities and outcomes.

UNESCO (2021) The Global Education Monitoring Report from UNESCO (2021) highlighted that gender gap in access and financing for education is still a significant issue in the developing countries. The report highlighted the importance of regional inequalities, poverty, and social discrimination on household decision making on educational spending, especially for girls.

Sarkar (2022) examined the trends in household spending on higher education in India and found that parental education, family income and institutional type play an important role in educational spending. The study also indicated that the financial investment of the female students in professional courses is still relatively less when compared with male students.

The World Bank (2022) studied the issue of educational inequality and education financing issues in the South Asian region and observed that increasing private education spending has increased the socio-economic gap and gender gap in access to higher education. The report highlighted the need for gender-sensitive scholarship policies and public investments to achieve equity in education.

Using panel data analysis, Sezgin et al. (2023) reveal that remittances are important in improving human capital formation by boosting expenditure on education within the household. The study concludes that remittances serve as an important external source of income in remittance dependent economies like South Asian countries, Nepal and Bangladesh. Such inflows support household financial stability, ease household liquidity pressures, and increase families' ability to invest in education. As such, remittances have positive impacts on the availability of education and long-term human capital development.

Rani and Biswas (2023) have examined the differences among Indian States in higher education spending and have found significant variations in urban and rural households. Based upon their observations, the researchers found that there are extra financial constraints in economically weaker and North-Eastern regions because of poor educational facilities and migration cost.

OECD (2024) pointed out that the costs of digital learning, the institutional privatization and uncertainty about jobs contribute to the rising importance of household expenditure on higher education. The report pointed out that financial limitations are a significant constraint for women's access to quality higher education in developing economies.

Askarov and Doucouliagos (2024) use a meta-regression analysis to find that remittance inflows have a positive and statistically significant effect on the education expenditure of the household in developing countries. Their analysis reveals that remittances boost on average the education budget by about 15-35 per cent. This underscores the importance of migration-related income in the development of human capital. The study also indicates that remittances reduce financial constraints faced by households, which thereby allows them to invest in their children's future education, thereby expanding their education.

Remittances have been found to be one of the key drivers to alleviate poverty status of the households and improve the overall consumption capacity of households in South Asian countries (Khan 2023). The study reveals that the financial stability of the recipient households improves with remittance inflows, which in turn reduces the financial constraints faced by them. This better economic status enables greater investment in education, especially higher education, as families can invest in education-related costs. The indirect but significant contribution of remittances to the enhancement of human capital development in the South Asian experience is brought out in the findings.

Amartya and Mallick (2023) state, poverty and income inequality persist as key structural constraints to human capital development in developing economies. The study points out that financial constraints on the liquidity of poorer households are also severe, making it difficult for them to invest in higher education, thereby reinforcing their lower ability to afford higher education. Furthermore, education costs are high among the poor, for example in the form of foregone income if they choose to work instead of study, which makes educational investment less attractive. The results confirm that longstanding socio-economic disparities are significant obstacles to quality education and limit access to all children and young people to higher education, thereby reinforcing intergenerational educational and poverty-related disadvantage.

Amartey (2026) points out that the efficiency and equity of the allocation of resources is as much a determinant as the overall amount of money being spent on education. The study highlights that the differences in the level of poverty and median household income are important explanatory factors affecting educational outcomes and household welfare. It also states that equitable distribution of educational resources is imperative to guarantee access to higher education to ensure inclusive education because inequitable distribution contributes to perpetuate the existing socio-economic inequalities across the developing economies.

3. Methodology

3.1. Data Sources

The data was secondarily compiled from several internationally recognized and nationally published databases, which provided reliable, comparable and robust econometric analyses for the present study. World Bank World Development Indicators (WDI) are used to capture key macroeconomic and household level indicators, and they are standardized cross-country datasets of income, poverty, unemployment and education related indicators. Other educational information and figures related to enrolment has been taken from the UNESCO Institute for Statistics (UIS) that provides extensive data on access and expenditure on tertiary education.

In addition, the Asian Development Bank (ADB) reports have been used to gather region-specific information and insights on the financing of education in South Asia. Micro-level relevance has been achieved by augmenting country-specific patterns of household behavior and expenditure with data from the National Household Survey (NHS), from selected South Asian countries. Detailed information has also been collected from the Pakistan Economic Survey and Nepal Development Reports in terms of economic and education sector information. These sources make up a comprehensive and balanced data set for econometric estimation and cross-country comparative analysis.

3.2. Variables

Table 1 Description of Variables Used in the Econometric Model

Variable	Description
HHEXP	Household expenditure on higher education (% of income)
INC	Household income per capita
UNEMP	Unemployment rate
POV	Poverty headcount ratio
REM	Remittances (% of GDP)
EDU	Tertiary education enrolment rate

Table 1 gives an overview of the key variables that are applied in the econometric model for the analysis of household finance for higher education in South Asia. Higher education expenditures (HHEXP) are measured as a proportion of household income, and thus capture investment behavior in human capital formation. The explanatory variables are: INC: household income per capita; UNEMP: labour market conditions; POV: poverty rate; REM: remittance inflows as a percentage of GDP; and EDU: tertiary education enrolment rate. These variables together give a full picture to determine the impact of economic, social and demographic factors on the decision of the household to spend on higher education.

3.3. Econometric Model

A panel fixed-effects regression model is employed:

$$HHEXP_{it} = \beta_0 + \beta_1 INC_{it} + \beta_2 UNEMP_{it} + \beta_3 POV_{it} + \beta_4 REM_{it} + \beta_5 EDU_{it} + \mu_i + \varepsilon_{it}$$

Where:

- (i) = country
- (t) = time period
- (μ_i) = country-specific effects
- (ε_{it}) = error term

3.4. Expected Signs

Table 2 Expected Signs of Socio-Economic Variables in the Determinants of Higher Education Expenditure Model

Variable	Expected Effect
INC	Positive
UNEMP	Negative
POV	Negative
REM	Positive
EDU	Positive

Table 2 shows the anticipated directionality of the impact of important socio-economic factors on higher education spending. Income (INC) is expected to be positive because more income by households will provide more resources for education. Expenditure is likely to be negatively influenced by unemployment (UNEMP) and poverty (POV) which indicate reductions in financial resources and affordability. Remittances (REM) are expected to have a positive effect through alleviating liquidity constraints and increasing expenditures on education. Education level (EDU) is also likely to be a positive influence, as higher education is more valued and invested in by more educated households.

3.5. Estimation Technique

Fixed Effects (FE) is used as an empirical approach to study the relationship between the economic conditions of the household and financing of higher education in selected South Asian countries. The FE approach is appropriate since it accounts for unobserved heterogeneity (across countries) that is constant over time, which yields more reliable and unbiased estimates. The Hausman specification test is used to test the suitability of the FE model when compared to the Random Effects alternative. In addition, robust standard errors are used to handle the potential heteroskedasticity problem in the panel data, providing consistent inferences and greater confidence in the estimates of the coefficients. Also, the independence of the explanatory variables is checked by calculating the Variance Inflation Factor (VIF) which prevents the independent variables from being too highly correlated to give the regression results that are cast in a distorted light. Together, these techniques enhance the robustness and validity of the econometric analysis.

4. Results

Table 3 Regression Estimates of Socio-Economic Determinants Influencing Higher Education Expenditure

Variable	Coefficient	Significance
INC	+0.62	***
UNEMP	−0.41	***
POV	−0.55	***
REM	+0.38	**
EDU	+0.47	***

The regression estimates of the socio-economic variables that affect higher education expenditure are shown in Table 3. Income (INC) has a positive and highly significant impact, meaning that increased income significantly raises expenditure on education. The coefficients for Unemployment (UNEMP) and poverty (POV) are both negative and significant, indicating greater economic hardship will be associated with less capacity to pursue higher education. Remittances (REM) is a positive and relatively strong influence, under the impact of reducing financial constraints. In addition, education level (EDU) is positive and highly significant, suggesting that households with higher levels of education are more likely to spend more on education.

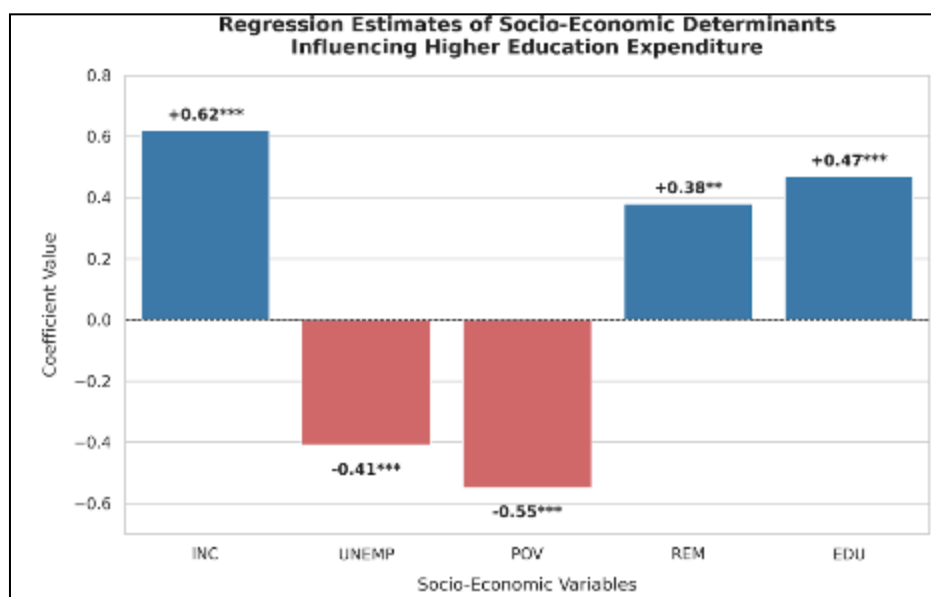


Figure 1 Regression Coefficients of Socio-Economic Factors Affecting Higher Education Expenditure

Table 4 Comparative Overview of Education Financing Levels in Selected South Asian Countries

Country	Education Financing Level
Sri Lanka	High
India	Moderately High
Bangladesh	Moderate
Nepal	Low-Moderate
Pakistan	Lowest

Table 4: Comparative statistics of education financing in selected countries of South Asia. Sri Lanka is recognized as having high education financing, with a greater level of policy commitment and public investment. Moderately high, reflecting some significant, but uneven allocation of educational resources, follows India. Bangladesh is defined as "moderate", meaning that funding is not heavy but is indicative of moderate levels. Nepal has been rated in the low-moderate category, indicating low fiscal capacity. The level of education financing in Pakistan is the lowest among the region, which highlights huge structural and fiscal problems in the education sector.

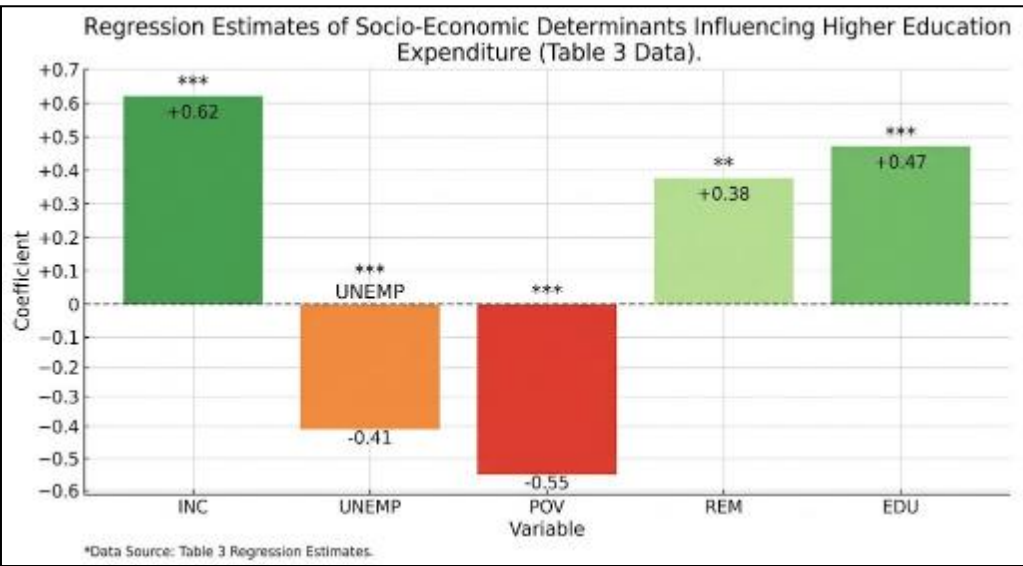


Figure 2 Comparative Qualitative Levels of Education Financing across Selected South Asian Countries.

5. Discussion

The findings reflect that in South Asia, income has a significant impact on financing higher education. Poverty and unemployment have a negative impact on investment in education, which further contributes to the inequality of access to higher education.

In both countries, remittances have a significant impact on education expenditure, suggesting a financial buffer effect. Sri Lanka exhibits relatively high levels of public education support and thus, low household burden. High poverty and limited affordability level are the reasons for the poor performance of Pakistan. The model confirms robust cross country heterogeneity, indicating that there are structural differences in the education financing system.

5.1. Policy Implications

5.1.1. Targeted Income Based Education Subsidies

Education subsidies on the basis of income should be targeted policy instruments to improve equity and accessibility to higher education in South Asia. Government needs to boost income-sensitive measures that more directly address the financial limitations of low and middle income households. This can range from means-tested scholarships, prioritizing

those in the lowest income brackets, to tuition fee waivers for eligible categories, and conditional cash transfer programs that are contingent on enrolment and attendance. In addition, performance-based grants may also be considered to promote student success without sacrificing inclusion. The specific targeting of interventions ensures that public resources are used efficiently and that the interventions reach the most deserving recipients and avoid wastage and lessen policy impact. These subsidies would decrease the direct and indirect expenses of higher education, which can have a significant impact on enrolment and dropout rates. In conclusion, income support mechanisms help to achieve better equity, better human capital and better social-economic mobility in developing economies.

5.1.2. Growth of Student Loan/ Credit Systems

A sound, effective and user-friendly student credit system is an essential tool to solve the problem of financing constraints in higher education, especially in the developing economies of South Asia. The reforms of the policy must be geared towards making education loans inclusive, affordable and student friendly. That means the interest rate should be lowered by the government subsidy or interest subvention schemes, which will make it easier for students and their families to pay back loans. More such facilities for availing loans without any collaterals are also needed to make higher education available to the students from the economically weaker sections of the society. Moreover, the incorporation of income contingent repayment options can substantially enhance repayment flexibility through tying payments to post-graduation income. There is room for enhancing credit availability, risk-sharing arrangements and lowering default rates through strengthening public-private partnerships in education financing. In sum, an effective student loan program can be a key determinant of higher education accessibility and socio-economic mobility.

5.1.3. Utilization of Remittances for Education Investment

Remittances are an important source of earnings for households in many South Asian countries and can be a catalyst in the financing of higher education. The policy should be put in place to promote utilizing these funds for educational progress. Governments can create specific education savings plans to encourage families to allocate remittances to education and subsequent costs. Matching grant programmes can have an even greater effect on remittance investments in human capital formation. Further, greater efficiency and reliability in fund transfers can be achieved by reducing the transaction costs and making access to formal remittance service more convenient. Promotion of financial literacy programmes should also be encouraged to assist households in making decisions on investment in education. Countries can use remittances for investments in higher education, contribute to the improvement of human capital development, reduce financing constraints of individuals and families, and improve long-term socio-economic mobility at the national and household levels.

5.1.4. Improve Public Education Funding

Public funding of higher education needs to be enhanced to build equity and secure socio-economic development for the future. The governments of South Asia need to invest more in education, notably higher education, to improve infrastructure and to overcome scarcity of resources. The efficient use of funds is also crucial, which needs to be achieved through better governance, transparency, and performance-based funding of educational institutions. There is a need to pay special consideration to the elimination of regional differences, including equal financial resources among urban and rural institutions. Furthermore, the allocation of public investment can also limit the need for funding from private sources and increase access to higher education at more affordable costs. In the end, the provision of long-term public investment leads to better quality education, higher enrolment, and development of a labor force that can fit market demands in a rapidly changing global economy.

5.1.5. Regional Cooperation in South Asian Education Policy

The socio-economic issues in funding and increasing higher education enrolment are similar in South Asian countries and thus regional cooperation is a need of this modern era. A strategic education policy framework can make a substantial contribution to the effectiveness and equity of higher education systems in the region. Structured knowledge sharing platforms, joint scholarship initiatives and inter-country credit transfers to enable student mobility are some key activities that can be undertaken. There is also room for further improving the comparability and recognition of qualifications across borders, through the harmonization of academic curricula and quality assurance. Such collaboration would also help in building institutional capacity in under-resourced institutions and facilitate regional academic integration. Regional bodies like SAARC have the potential to promote dialogue, policy co-ordination and collaborative research and educational exchange programmes which can lead to South Asian higher education being more integrated and equitable.

Limitations of the Study

The study has some limitations that need to be taken into consideration when interpreting the results of this study. First, variables across the various countries in South Asia are not necessarily comparable because the data sets are not harmonized completely. Secondly, availability of micro-level panel data is also limited, which limits household-level analysis over time. Third, there could be measurement errors because of the inaccuracy of self-reported income and expenditure data, and this may impact the precision of the estimates. Fourth, the study does not cover informal channels of financing education, which are important for many of the developing economies. At the end of the day, the data situation in each country in the region results in varied empirical coverages, which restricts the generalizability of the results.

6. Conclusion

The current research concludes that the domestic economic conditions have an influential and structurally important role in determining the financing of higher education in the countries of South Asia. The econometric evidence clearly shows that household income and remittance inflows are significant positive factors on investments in education, meaning that an increase in a family's income or remittance inflows also increases its capacity to invest in higher education. Contrary to this, unemployment and poverty have a strong negative effect on the possibility and ability of households to invest in tertiary education and therefore exacerbates existing socio-economic inequalities. The fixed-effects panel analysis also shows sizeable cross-country differences in the financing patterns of higher education. Household investment patterns are relatively stronger in countries like Sri Lanka and India as a result of comparatively better income level and a relatively stable socio-economic structure. In contrast, Pakistan has the lowest amount of household educational spending, which indicates that poverty and unemployment, as well as insufficient financial support systems, are still major constraints. The situation is in between in Bangladesh and Nepal where remittance has an important compensatory role in financing education.

In general, the results reveal that the chances of higher education enrollment in South Asian territories are still very much dependent on the economic status of the household, and thus are vulnerable to household-level economic shocks and inequalities. The study highlights the need for policy interventions, such as providing income support, subsidizing education financing, developing federal credit systems and increasing public funding for higher education, which are both targeted and inclusive. These are vital to narrow the gap between countries and facilitate the equitable and inclusive access to higher education and sustainable development in the region of South Asia.

Compliance with ethical standards*Acknowledgements*

We appreciate the contribution of each participant who participated in this study. We wish to recognize those who assisted us with data collection as well.

Disclosure of conflict of interest

The authors declare no conflict of interest.

Statement of ethical approval

Prior to collecting the data for this research project ethical clearance was obtained through an Institutional Review Board Committee.

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