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Children's education, adult schooling, and household wealth in Arunachal Pradesh: An Autoregressive Distributed Lag (ARDL) approach

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ABSTRACT

This study examines the relationship between education and household wealth in Arunachal Pradesh from 1992 to 2022 by analyzing the effects of children's educational attendance and adults' mean years of education on the Mean International Wealth Index. Using annual time-series data from the Global Data Lab Area Database, the study applies the Autoregressive Distributed Lag (ARDL) approach to assess short-run dynamics and long-run association among the variables. The empirical results indicate that adult educational attainment is positively and significantly associated with household wealth, suggesting that accumulated adult human capital plays an important role in wealth generation in the state. Children's educational attendance shows a negative contemporaneous effect but a positive lagged effect, implying that schooling may impose short-run resource pressures on households while generating longer-term economic benefits. The bounds test provides evidence of a long-run relationship among the variables; however, the positive and statistically significant error correction term in the restricted error-correction model suggests that the standard convergence pattern is not observed in the current specification. The findings therefore support a dynamic education–wealth relationship, but the adjustment mechanism should be interpreted cautiously. Overall, the study contributes to the limited literature on the education–wealth nexus in Arunachal Pradesh and highlights the importance of sustained investment in both child and adult education for long-term socioeconomic development.

KEY WORDS

Compulsory schooling; Wealth; Equality of opportunity; Northeast India; Educational attainment

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Introduction

Education is widely recognized as a foundational component of human development and socioeconomic progress. For children, it is an important right and an important way to develop cognitive skills, social capacity and future economic participation. Education for adults increases the adaptive capacity, improves labour-market outcomes, enhances decision-making and strengthens participation in social and economic life [1-4]. Education increases productivity expands the range of occupations available and enhances the household's ability to accumulate assets over time, from a human capital perspective. Thus, the education-wealth relationship is social or cultural. It is also economic, and quite deeply so, through income generation, skill formation, intergenerational mobility and access to opportunity.

These relationships are especially important in regions where structural constraints limit the translation of resources into broad-based development. Arunachal Pradesh, one of the northeastern states of India, presents a particularly relevant context for examining the education–wealth nexus. Since independence, the state has experienced remarkable progress in literacy and access to education. Despite this, infrastructural gaps, gender imbalance, uneven accessibility and the necessity for culturally relevant curricula continue to impact on educational development. At the same time, the wider process of the state's socioeconomic transformation remains incomplete with changing entrepreneurial support, institutional depth and inclusive development [4,5]. Such conditions require that education be studied not only as a measure of welfare but also as a force of wealth creation.

Available evidence suggests that the channels through which education affects wealth in Arunachal Pradesh are multiple and interrelated. Education helps to improve livelihood opportunities, increases the economic participation of women, enhances the capability of enterprises and facilitates social mobility among the tribal and rural populations [6,7]. At the same time, regional deprivation, inequality and uneven access to productive opportunities may condition the strength and timing of this relation [7]. This is especially important in distinguishing between educational attendance of children and educational attainment of adults, as the two can impact on wealth through different temporal mechanisms.

In this context, the present study investigates the effect of children's education and adult education on the wealth index in Arunachal Pradesh. About the intergenerational and dynamic nature of the education–wealth association, the study considers both child attendance and adult educational attainment. For this purpose, it uses the ARDL model to examine the time series relationship of these educational variables with wealth in Arunachal Pradesh.

Education and wealth linkages in Arunachal Pradesh

Arunachal Pradesh's economic and social avenues are linked to the creation of wealth through education. Education increases the productive potential, the chances of finding a job and the ability to change jobs and the ability of individuals and households to participate in activities that generate income. Such effects are particularly relevant in a geographically isolated, historically underdeveloped state such as Arunachal Pradesh, where educational attainment constitutes a vehicle for overcoming structural disadvantages as much as it is for upward mobility. In this sense, the capacity to generate wealth depends on the

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availability of resources, but also on the ability of individuals to convert opportunities into sustained economic gains.

Evidence from Arunachal Pradesh indicates that education has a particularly important role in shaping livelihood outcomes among women, rural populations, and socially marginalized communities. For women retailers, higher educational attainment is associated with better earnings, improved enterprise management, stronger customer relations, and greater competitiveness in local markets. These findings suggest that education contributes to wealth not only by increasing labour productivity but also by improving the quality of economic participation and decision-making in small-scale commercial activities [6]. At the same time, higher income associated with education does not automatically translate into complete economic freedom or autonomy, particularly for women, because social and institutional constraints may continue to limit the conversion of income gains into broader economic empowerment [8]. This distinction is important because it suggests that education may promote wealth accumulation even when the broader structure of opportunity remains unequal.

Education is equally important in the context of tribal and rural livelihoods. In Arunachal Pradesh, education is generally viewed as a tool for enhancing participation in economic activity, elevating social status, and improving livelihood security for indigenous communities such as the Galo [9]. More generally, literacy and education improve poverty alleviation and economic development by increasing people's ability to access information, participate in markets, learn new skills and adapt to changing development prospects [7]. Thus, the gradual expansion of educational opportunities in the state since independence has implications for improving literacy but also for the long-term transformation of the socio-economic conditions, although disparities persist across gender and social groups [10].

Children's education and adult education, however, affect wealth generation through partly different mechanisms and time horizons. Investing in children's education is good for future income, skill formation and intergenerational mobility. In this respect, the effects on wealth are often deferred rather than immediate. Higher school participation can improve long-run household welfare by increasing the productivity and earning capacity of the next generation. This broader view of linking educational development with improved economic opportunities and poverty reduction is supported with discussions on Arunachal Pradesh existing in the literature [10]. Indirect evidence for large economic returns of education obtained earlier in life is also provided by women's income patterns [8]. At the same time, child-related educational expenditure may put short-run resource pressure on households, especially where incomes are low, and access costs remain substantial. That means the short-run relationship of children's schooling and household wealth may be different from its longer-run effect.

Adult education has a more immediate connection with wealth generation because it affects current productivity, labour-market participation, entrepreneurial capability, and financial decision-making. In Arunachal Pradesh, adult education appears especially relevant for women engaged in trade, self-employment, and retail activity, where educational attainment directly improves earnings and business performance [8]. Government training and skill-development programmes linked to Self-Help Groups (SHGs) further demonstrate that education and capability-building can enhance the economic position of adult participants through self-employment and small-enterprise activities [11]. However, access to such opportunities is unequally distributed, and the benefits of education may be shaped by existing inequalities in wealth, gender, and social position [11,12].

In sum, the literature suggests that education in Arunachal Pradesh is not just a social good but a major economic variable with wealth creation, poverty reduction and regional development. But its effects are not immediate or uniform. They range across children and adults, across genders and social groups, and across short- and long-run horizons. This suggests that the relationship between education and wealth should be examined in a dynamic perspective that includes both immediate and deferred effects. In this context, the present study explores the impact of children's educational attendance and adults' educational attainment on the wealth index over time in Arunachal Pradesh.

Objectives of the study

This study aims to analyze the impact of children's educational attendance and adults' educational attainment on the Mean International Wealth Index in Arunachal Pradesh during the period 1992–2022. It further seeks to identify the short-run dynamics and long-run relationship between education and household wealth by applying the ARDL approach.

Data collection

The study relies exclusively on secondary data drawn from the Global Data Lab Area Database of the Nijmegen School of Management, Radboud University, the Netherlands. Data were collected for Arunachal Pradesh during 1992–2022. The analysis uses three variables: i) mean international wealth index as dependent variable, ii) educational attendance of children between 6 and 8 years of age and iii) mean years of education of adults aged 20 years and above as explanatory variables. These measures were chosen to represent both current involvement in education and total educational attainment in the state. The data set has a time series structure, which enables us to test the short run and long run relationship between education and wealth using the ARDL approach.

Research Methodology

The study employed a well-established approach, the ARDL method, as proposed by Pesaran et al. [13]. ARDL models develop autoregressive models by incorporating lags of explanatory variables. While ARDL models are technically AR-X models, the fundamental distinction is that ARDL models focus on exogenous variables and select the appropriate lag structure for both endogenous and exogenous variables. ARDL models are closely related to Vector Autoregressions, and a single ARDL is actually one row of a VAR. The key difference is that an ARDL treats exogenous variables as exogenous, meaning it is not essential to include the endogenous variable as a predictor of the exogenous variables.

The complete specification of the ARDL model is

$$Y_t = \delta_0 + \delta_1 t + \cdots + \delta_k t^k + \sum_{i=0}^{s-1} \gamma_i S_i + \sum_{p=1}^{P} \phi_p Y_{t-p} + \sum_{k=1}^{M} \sum_{j=0}^{Q_k} \beta_{kj} X_{kt-j} + Z_t \Gamma + \epsilon_t$$

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where

$\delta_0 + \delta_1 t + \cdots + \delta_k t^k$ = Constant and Trend

$\sum_{i=0}^{s-1} \gamma_i S_i$ = Seasonal

$\sum_{p=1}^{P} \phi_p Y_{t-p}$ = Autoregressive

$Z_t \Gamma$ = Fixed

The above data presents the complete specification of the ARDL model used in this study. The model includes five components: constant and trend, seasonal terms, autoregressive terms, distributed lag terms, and fixed regressors. These components together capture deterministic movements, seasonal variation, persistence in the dependent variable, lagged effects of explanatory variables, and other fixed influences.

The ARDL approach is suitable for this study because it can be used when the variables are a combination of I(0) and I(1) processes, provided that none of the series is integrated of order two. Therefore, before estimating the model, the stationarity properties of the variables are examined in levels and first differences to ensure that the ARDL bounds-testing procedure is valid. This step is essential because the presence of an I(2) variable would invalidate the long-run inference from the ARDL framework. Once the integration order is verified, the model can be estimated to capture both short-run dynamics and long-run relationships among the variables.

The terms in the model are:

- δ_i : constant and deterministic time regressors. Set using trend.
- S_i : are seasonal dummies.
- $x_{k,t-j}$: are the exogenous regressors. There are a number of configurations that can be utilized to specify which lags are included.
- Z_t: are any other fixed regressors that are not element of the distributed lag specification. In practice, these regressors may be incorporated when they do not contribute to the long-run relationship between Y_t and the vector of exogenous variables X_t .
- ϵ_t : is assumed to be a White Noise process.

The ARDL model in levels form is specified, with the dependent variable being the Mean International Wealth Index and the explanatory variables being educational attendance among children aged 6–8 years and the mean years of education of adults aged 20 years and above.

$$MIWI_t = \alpha_0 + \sum_{p=1}^{P} \phi_p MIWI_{t-p} + \sum_{j=0}^{Q_1} \beta_{1j} EATT_{t-j} + \sum_{j=0}^{Q_2} \beta_{2j} MYE_{t-j} + \epsilon_t$$

Here, $MIWI_t$ is the Mean International Wealth Index, $EATT_t$ is educational attendance among children aged 6–8, and MYE_t is mean years of education of adults aged 20+ years.

where:

- $MIWI_t$ = Mean International Wealth Index
- α_0 = constant
- $\sum_{p=1}^{P} \phi_p MIWI_{t-p}$ = lagged dependent variable terms
- $\sum_{j=0}^{Q_1} \beta_{1j} EATT_{t-j}$ = educational attendance terms
- $\sum_{j=0}^{Q_2} \beta_{2j} MYE_{t-j}$ = mean years of education terms
- ϵ_t = error term

Further, residual diagnostic and stability tests are required to validate the adequacy of the ARDL specification before drawing substantive conclusions from the estimated short-run and long-run coefficients.

Validation of the estimated ARDL specification requires post-estimation diagnostics for serial correlation, heteroskedasticity, residual normality and parameter stability. Serial correlation can be tested by the Breusch-Godfrey LM test. Heteroskedasticity can be tested by a variance-based test like White's test. Normality can be tested by the Jarque-Bera statistic and stability can be tested by CUSUM and CUSUMSQ plots. Such diagnostic checks are important because the presence of statistically significant coefficients does not imply model adequacy. A good ARDL model will also satisfy the assumptions of well-behaved residuals and stable parameters over time.

Analysis and interpretation

The analysis commences with the Phillips-Perron Unit Root test to specify the stationarity of the variables in the dataset.

Hypothesis 1:

Phillips-Perron Unit Root Test
data: Wealth_Index
Dickey-Fuller Z(alpha) = -6.8036, Truncation lag parameter = 2, p-value = 0.694
alternative hypothesis: stationary

Hypothesis 2:

Phillips-Perron Unit Root Test
data: Educational_attendance_children_age_6_8
Dickey-Fuller Z(alpha) = -6.3746, Truncation lag parameter = 2, p-value = 0.7222
alternative hypothesis: stationary

Hypothesis 3:

Phillips-Perron Unit Root Test
data: Mean_years_education_of_adults_aged_20
Dickey-Fuller Z(alpha) = -7.3668, Truncation lag parameter = 2, p-value = 0.657
alternative hypothesis: stationary

Hypothesis 1-3 represent the Phillips-Perron Unit Root test for the Mean International Wealth Index, educational attendance in children aged between 6 and 8 years, and the Mean years of education of adults aged over 20 years.

The null hypothesis of the Phillips-Perron unit root test is that the time series contains a unit root, meaning it is non-stationary, and the alternative hypothesis is that the time series is stationary. As demonstrated in Hypothesis 1-3, the null hypothesis has been accepted in every case, implying that all three variables are non-stationary in Arunachal Pradesh from 1992 to 2022. It implies that their statistical properties, such as the mean and variance, change over time.

Figure 1. Time series plot of Mean International Wealth Index in Arunachal Pradesh, 1992–2022.

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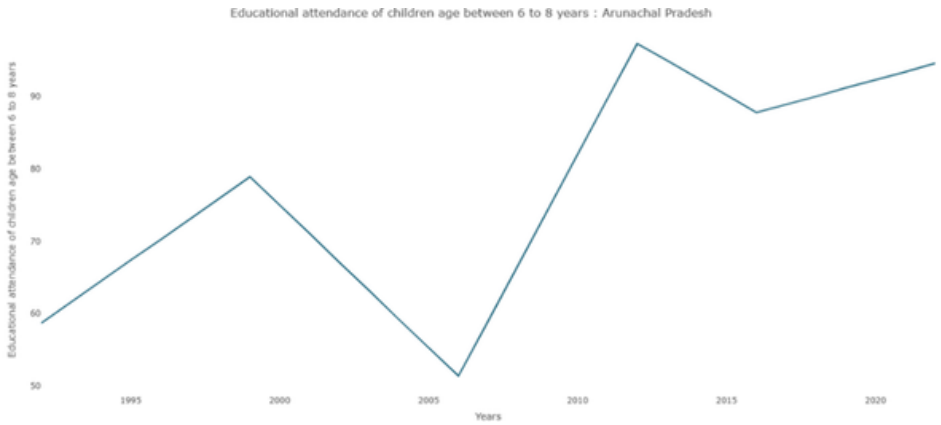

Figure 2. Time series plot of educational attendance among children aged 6–8 years in Arunachal Pradesh, 1992–2022.

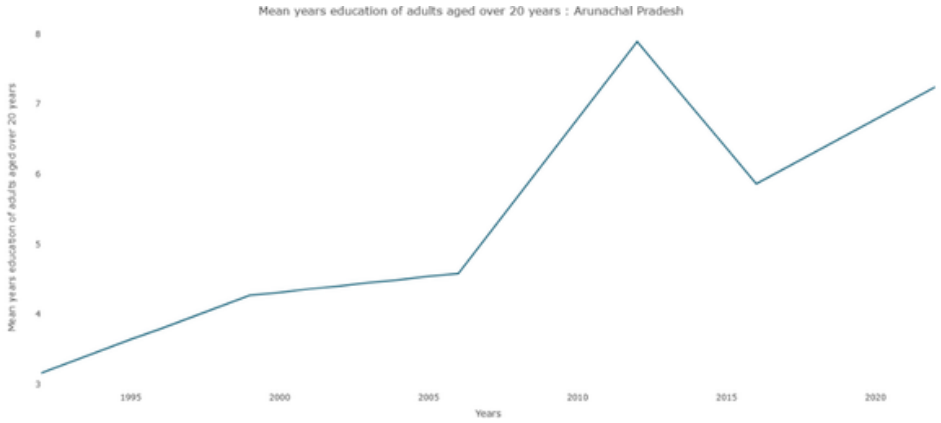

Figure 3. Time series plot of mean years of education of adults aged 20 years and above in Arunachal Pradesh, 1992–2022.

Figures 1-3, exhibit time series plots of the Mean International Wealth Index, educational attendance among children aged 6 to 8 years, and the Mean years of education of adults aged 20 years and older. These figures also show the fluctuations of the variables, as indicated by the Phillips-Perron unit root test.

The Phillips–Perron unit root results indicate that the variables are non-stationary in levels, which justifies the use of a dynamic time-series framework for further analysis. After confirming the order of integration, the study proceeds to estimate the ARDL model, which is appropriate for examining relationships among variables that are a mixture of I(0) and I(1) but not I(2). The estimated ARDL(4,1,1) specification shows that both the dependent variable and the educational variables exhibit meaningful dynamic effects over time. The current and lagged values of the Mean International Wealth Index remain highly significant, suggesting strong persistence in wealth formation in Arunachal Pradesh. Similarly, the current and lagged effects of children's educational attendance and adults' mean years of education indicate that the relationship between education and wealth operates through both immediate and delayed channels. The negative contemporaneous effect of children's attendance may reflect short-run household resource constraints associated with schooling costs, while the positive lagged effect suggests that educational investment pays off in the long run. Conversely, adult education seems to be the strongest positive correlate of wealth, suggesting that the accumulated human capital of adults is an important factor in generating current wealth. The bounds test confirms the existence of a long-run relationship among the variables indicating the estimated model captures the short-run fluctuations and long-run dynamic association.

The stationarity of the variables was also examined after first differencing to confirm the order of integration and to ensure the validity of the ARDL procedure. The results show that all variables become stationary after first differencing, implying that they are I(1) series and that none is I(2). This is an important requirement for the bounds-testing approach, because the ARDL framework can accommodate a mix of I(0) and I(1) variables but not I(2) variables. The confirmation of first-difference stationarity therefore supports the use of ARDL for examining both the short-run and long-run association between education and wealth in Arunachal Pradesh.

"auto_ardl" code in R has been applied to automatically find the optimal order of lags for an ARDL model based on a chosen information criterion (e.g., AIC or BIC) and specified constraints. It suggests an ARDL(4,1,1) order with an AIC of 3.693469, the lowest among all combinations. ARDL(4,1,1) implies four lags of the Mean International Wealth Index, one lag of educational attendance in children aged between 6 and 8 years, and one lag of the Mean years of education of adults aged over 20 years. The selected ARDL(4,1,1) specification is used for estimation and interpretation.

The estimated ARDL model was further subjected to residual diagnostic and stability checks to assess its reliability.

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The diagnostic results indicate that the model does not suffer from serious serial correlation, heteroskedasticity, or non-normality in the residuals, suggesting that the estimated coefficients are statistically dependable. In addition, the stability plots based on cumulative sum procedures remain within the critical boundaries, indicating that the parameters are stable over the sample period and that the model specification is structurally sound. Taken together, these diagnostic findings support the adequacy of the ARDL framework for analyzing the relationship between children's educational attendance, adults' mean years of education, and household wealth in Arunachal Pradesh.

Table 1. Estimated ARDL(4,1,1) model for education and wealth in Arunachal Pradesh.

Call:

stats::lm(formula = formula, data = objmodel)

Residuals:					
Min	**1Q**	**Median**	**3Q**	**Max**	
-0.35235	-0.12703	-0.00256	0.11357	0.39764	
Coefficients:	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	-0.55576	0.33125	-1.678	0.1107	
`L(Mean.International.Wealth.Index, 1)`	1.02959	0.06222	16.548	2.46E-12	***
`L(Mean.International.Wealth.Index, 2)`	-0.05732	0.10539	-0.544	0.5932	
`L(Mean.International.Wealth.Index, 3)`	-0.04052	0.1006	-0.403	0.6919	
`L(Mean.International.Wealth.Index, 4)`	0.10745	0.05529	1.943	0.0678	.
Educational_attendance_children_6_8	-0.30774	0.02341	-13.146	1.15E-10	***
`L(Educational_attendance_children_6_8, 1)`	0.28834	0.02236	12.893	1.57E-10	***
Mean_years_education_of_adults_aged_20.	6.29386	0.3694	17.038	1.50E-12	***
`L(Mean_years_education_of_adults_aged_20., 1)`	-5.96341	0.31891	-18.699	3.07E-13	***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.2191 on 18 degrees of freedom

Multiple R-squared: 0.9999, Adjusted R-squared: 0.9998

F-statistic: 1.638e+04 on 8 and 18 DF, p-value: < 2.2e-16

Table 1 represents the linear transformation of the ARDL(4,1,1) model. The ARDL model has been constructed to analyze the complex dynamics among the Mean International Wealth Index, educational attendance in children aged between 6 and 8 years, and the Mean years of education of adults aged over 20 years over the years between 1992 and 2022, and to identify both their long-run relationship and short-run adjustment behaviours.

From the ARDL (4,1,1) model, the interpretation can be drawn as:

In the context of the explanation of the variation of the Mean International Wealth Index of Arunachal Pradesh from 1992 to 2022, one year and four-year previous value of Mean International Wealth Index, current value and one-year previous value of educational attendance in children aged between 6 and 8 years, and current value and one-year previous value of mean years of education of adults aged over 20 years are statistically significant.

The Mean International Wealth Index in the previous period increases the Mean International Wealth Index in the current period by about 1.03 units. This is a strong positive effect with a 1-period lag.

The 4-period lag has a delayed effect on the current period. A 1 unit increase in the Mean International Wealth Index in the previous 4 years leads to an increase of about 0.107 units in the current period. In contrast, the effect is only marginally significant.

The current level of educational attendance (6-8 years) of children has a negative effect (-0.308 units) on the current mean International Wealth Index, which means an inverse relationship and is statistically significant.

The educational attendance of 6-8-year-old children of the previous period has a positive effect (0.288 units) on the current value of the mean International Wealth Index, which indicates a delayed positive effect.

There is a strong and positive impact (6.294 units) of the current value of the mean years of education of adults aged over 20 on the current value of the mean International Wealth Index.

An increase in the previous period's Mean years of education among adults aged 20 and above has a significant negative impact (-5.963 units) on the current mean International Wealth Index.

Afterwards, the Bound test was conducted on the ARDL (4,1,1) model to assess cointegration. Cointegration in time series analysis indicates a long-term, stable relationship between two or more non-stationary time series variables.

Hypothesis 4:

Bounds F-test (Wald) for no cointegration

data:

d(Mean.International.Wealth.Index)~L(Mean.International.Wealth.Index,1)+

L(Educational_attendance_children_6_8,1)+

L(Mean_years_education_of_adults_aged_20.,1)+
(L(Mean.International.Wealth.Index,1))

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+d(L(Mean.International.Wealth.Index,2)) + d(L(Mean.International.Wealth.Index,3)) + d(Educational_attendance_children_6_8)+ (Mean_years_education_of_adults_aged_20)

F = 75.189, p-value = 1e-06

Alternative hypothesis: Possible cointegration

Null values:

K=2, T=1000

Hypothesis 4 represents the result of the Bound test on the ARDL (4,1,1) model. In an ARDL bounds test, the null hypothesis (H0) is that there is no cointegration (i.e., no long-run relationship) between the variables in the model, and thealternative hypothesis generally proposes the presence of a long-run relationship (cointegration) between the variables. Based on the P-value of the bound test, the analysis indicates that there is cointegration, or a long-run relationship, between the dependent variable and the independent variables.

If cointegration is found, the Error Correction Model (ECM) is derived from the ARDL model to construct an Unrestricted Error Correction Model (UECM).

Table 2. Unrestricted error correction model (UECM) estimates based on the ARDL(4,1,1) specification.

Time series regression with "ts" data: Start = 5, End = 31

Call:

"dynlm::dynlm(formula = full_formula, data = data, start = start, end = end)"

Residuals:

	1Q	Median	3Q	Max	
-0.35235	-0.12703	-0.00256	0.11357	0.39764	
Coefficients:	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	-0.55576	0.331245	-1.678	0.1107	
L(Mean.International.Wealth.Index, 1)	0.039198	0.007605	5.154	6.66E-05	***
L(Educational_attendance_children_6_8, 1)	-0.0194	0.007217	-2.688	0.015	*
L(Mean_years_education_of_adults_aged_20., 1)	0.330447	0.135809	2.433	0.0256	*
d(L(Mean.International.Wealth.Index, 1))	-0.00961	0.062318	-0.154	0.8791	
d(L(Mean.International.Wealth.Index, 2))	-0.06694	0.061232	-1.093	0.2888	
d(L(Mean.International.Wealth.Index, 3))	-0.10746	0.055289	-1.943	0.0678	.
d(Educational_attendance_children_6_8)	-0.30774	0.023409	-13.146	1.15E-10	***
d(Mean_years_education_of_adults_aged_20.)	6.293856	0.369402	17.038	1.50E-12	***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.2191 on 18 degrees of freedom

Multiple R-squared: 0.9813,Adjusted R-squared: 0.973

F-statistic: 118.2 on 8 and 18 DF, p-value: 5.808e-14

Table 2 depicts the UECM constructed on the ARDL(4,1,1) model.UECM conversion of ARDL(4,1,1) suggests that:

There is a positive and significant (0.039 unit) long-run effect of the one-period previous value of the mean International Wealth Index on the current value of the same index itself.

There is a negative and significant (-0.019 unit) long-run effect of the one-period previous value of educational attendance of children aged 6-8 on the current value of the mean International Wealth Index.

There is a positive and significant (0.330 unit) long-run effect of the one-period previous value of the Mean years of education of adults aged 20 and above on the current value of the mean International Wealth Index.

There is a marginally significant negative (-0.107 unit) short-term impact of the three-period previous value of the mean International Wealth Index on the current value of the index itself.

There is a statistically significant negative short-term impact of the current value of children's educational attendance aged 6-8 on the current value of the mean International Wealth Index (0.308 units).

There is a strong, statistically significant positive (6.294 units) short-term impact of the current value of the mean years of education of adults aged 20 and above on the current value of the mean International Wealth Index.

The bounds test result strongly supports the cointegration among the variables, suggesting a long-run relationship between the Mean International Wealth Index, children's educational attendance and adults' mean years of education. This finding justifies the use of the error correction representation of the ARDL model. The UECM results show that adult education continues to have a positive and statistically significant effect on wealth while children's educational attendance continues to have a negative short-run effect. These results suggest that the adjustment processes in the short run may be different from the wealth accumulation patterns in the long run, especially in contexts where education investments take time to be materialized.

To analyze this relationship further and understand the short-run dynamics, the RECM (Restricted Error Correction Model) is employed. The coefficient of the ECT (Error Correction Term) indicates the speed of adjustment to the long-run relationship.

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Table 3. Restricted error correction model (RECM) estimates based on the ARDL(4,1,1) specification.

"Time series regression with ""zooreg"" data:
Start = 5, End = 31"
Call:"dynlm::dynlm(formula = full_formula, data = data, start = start, end = end)"
Residuals:

Min	1Q	Median	3Q	Max	
-0.35235	-0.127	-0.0026	0.11357	0.39764	
Coefficients:	Estimate	Std. Error	t value	Pr(>|t|)	
d(L(Mean.International.Wealth.Index, 1))	-0.0096	0.05705	-0.169	0.8678	
d(L(Mean.International.Wealth.Index, 2))	-0.0669	0.05623	-1.19	0.2472	
d(L(Mean.International.Wealth.Index, 3))	-0.1075	0.04623	-2.325	0.0302	*
d(Educational_attendance_children_6_8)	-0.3077	0.01731	-17.78	3.89E-14	***
d(Mean_years_education_of_adults_aged_20.)	6.29386	0.27351	23.012	2.23E-16	***
ect	0.0392	0.00209	18.732	1.38E-14	***

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Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 0.2029 on 21 degrees of freedom (0 observations deleted due to missingness)
Multiple R-squared: 0.9939,Adjusted R-squared:0.9921
F-statistic: 569.4 on 6 and 21 DF, p-value: < 2.2e-16

Table 3 represents the RECM constructed on the ARDL(4,1,1) model.

The RECM results indicate that short-run wealth movements are associated with contemporaneous changes in children's educational attendance and adults' mean years of education. Children's attendance shows a negative short-run association, while adult education remains positive and significant. The lagged wealth term is also significant, indicating persistence in wealth dynamics. However, because the error correction term is positive and significant, the results should be interpreted with caution as a dynamic association rather than as standard convergence to long-run equilibrium.

Conclusion

This study examined the relationship between education and household wealth in Arunachal Pradesh during 1992–2022 by analysing children's educational attendance and adults' mean years of education within an ARDL framework. The results indicate that education is strongly linked to the Mean International Wealth Index, but the effects operate differently across child schooling and adult attainment. Adult education emerges as a consistently positive and statistically significant determinant of household wealth, highlighting the importance of accumulated human capital in wealth formation. Children's educational attendance, by contrast, shows a negative contemporaneous association but a positive lagged effect, suggesting that schooling may impose short-run resource pressures on households while generating longer-term benefits. Although the bounds test indicates a long-run relationship among the variables, the positive and statistically significant error correction term in the RECM implies that the adjustment process does not follow the standard convergence pattern, and the results should therefore be interpreted cautiously as evidence of dynamic association rather than stable equilibrium correction. Overall, the study contributes to the limited literature on the education–wealth nexus in Arunachal Pradesh and underscores the policy importance of strengthening adult education, sustaining children's school participation, and improving institutional conditions that enable educational gains to translate into durable wealth accumulation.

Disclosure Statement

No potential conflict of interest was reported by the author.

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