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Determinants of Poverty in 16 Developing Asian Countries: Cross-Country Panel Evidence, 2011–2022

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Abstract
This study investigates the relationship between inflation, control of corruption, tertiary education enrolment, financial inclusion, portfolio investment, unemployment, and poverty across 16 developing Asian countries from 2011 to 2022. Poverty is quantified using the poverty headcount ratio, based on the $3.65-a-day poverty line. Utilizing an unbalanced panel dataset sourced from the World Bank, the study applies a Random Effects Model (REM) as the preferred specification for long-run estimation, as determined by the Lagrange Multiplier and Hausman tests. Short-run relationships are analyzed using an Error Correction Model (ECM). The long-term REM estimates reveal that tertiary education enrolment is the sole statistically significant variable, demonstrating a negative correlation with poverty ($p < 0.01$). In contrast, inflation, control of corruption, financial inclusion, portfolio investment, and unemployment do not exhibit statistical significance in the long term. In the short term, inflation ($\beta = -0.184, p = 0.017$), tertiary education enrolment ($\beta = -0.142, p < 0.01$), and financial inclusion ($\beta = -0.031, p = 0.039$) are negatively and statistically significantly associated with poverty. Conversely, control of corruption, portfolio investment, and unemployment do not show statistically significant relationships. This study provides cross-country panel evidence on the distinctions between short-term and long-term relationships among socioeconomic factors and poverty in developing Asian countries. Nonetheless, the positive and statistically significant error-correction coefficient (0.724) does not suggest conventional convergence towards long-term equilibrium, necessitating caution in interpreting the adjustment dynamics.

Keywords: Macroeconomics, Financial Inclusion, Poverty, ECM, Asian Countries

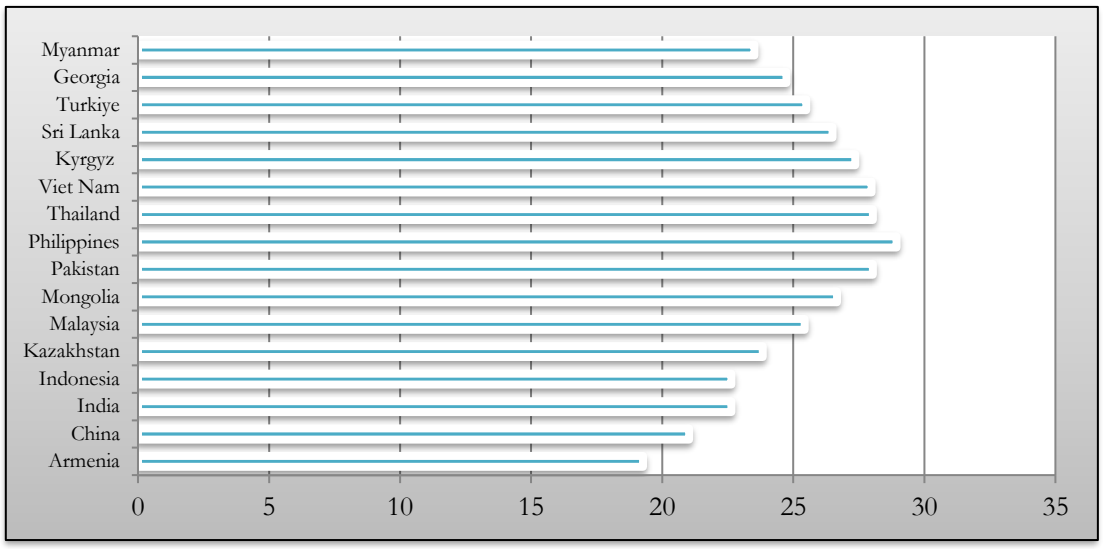
INTRODUCTION

The development of poverty that occurs in every country is a very vital problem and has an impact on development and the economy. In general, poverty is a condition of a person or household that is unable to fulfill their basic daily needs (Alkire et al., 2023; Decerf, 2023; Ngubane et al., 2023;

Tran & Le, 2021 and Uspri et al., 2023). The development of the times and technology at this time, making policy makers in poverty alleviation into many factors such as consumption poverty, corruption, low income, lack of education, and inadequate employment (Bijukchhen & Phaju, 2023; Ghodke & Giri, 2023; Ojeyinka & Ibukun, 2024; Olawumi et al., 2023; Pillay Pregala et al., 2023).

Poverty is basically divided into two approaches, namely the absolute and relative approaches (Decerf, 2023). Poverty in the absolute approach is poor people who are unable to fulfill their basic daily needs because they do not have enough money. Whereas, poverty in the relative approach is the poverty of an individual who is conditioned due to the environmental factors of a rich community, it is clear that a person can be said to be relatively poor if that person cannot access the average standard of living of his community, not only in terms of his food patterns but considering the possibility of participating in social activities or adjusting the usual environment (Danlami et al., 2020; M. S. Hassan et al., 2021; Mendonca dos Santos, 2017).

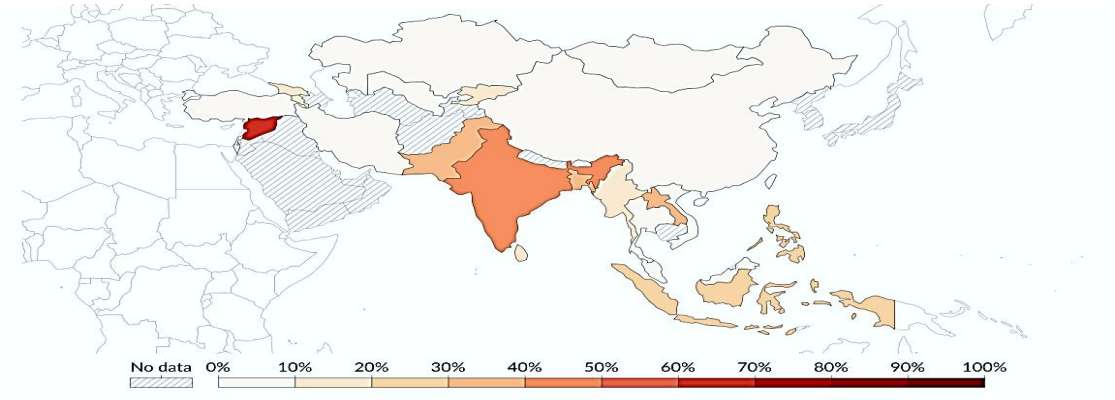
Figure 1. Graph of Average Poverty in 16 Developing Asian Countries 2011-2022



Source: World Bank, author compilation.

Figure 1 above shows a graph of the average annual poverty rate over the period 2011-2022 in 16 developing Asian countries in terms of the percentage of poor people earning less than $3.65 per day. Figure 1 above shows that each country has a different poverty rate for each period. It can be seen that the country with the largest contributor to poverty was India at 63.1% in 2011, then Pakistan also obtained a relatively high poverty rate of 51.7% in 2011. As for the next year, each country experienced a decrease in poverty as shown by Indonesia, which had a poverty rate of 47.6% in 2011 and decreased in 2022 by 20.2%. The following data is obtained from World Bank (2024) of developing Asian countries in 2022 with the following percentages of poor people living on less than $3.65 per day.

Figure 2. Poverty: Percentage of the World's Population Living on Less Than $3.65 a Day by 2022



Source: World Bank (2024), author compilation.

Figure 2 provides a comprehensive geographical depiction of poverty, highlighting the percentage of the population subsisting below the $3.65-a-day poverty threshold in 2022. This figure aims to offer contextual insights into poverty conditions beyond the nations included in the empirical analysis. Notably, Syria is referenced solely as a contextual example of poverty within the broader geographical region and is not part of the estimation sample. The empirical analysis conducted in this study is confined to 16 developing Asian countries, specifically Myanmar, Turkey, Sri Lanka, Viet Nam, the Philippines, Indonesia, Kazakhstan, China, Georgia, Malaysia, Kyrgyzstan, Thailand, Pakistan, Mongolia, India, and Armenia, as detailed in Appendix Table A1. Consequently, the countries depicted in Figure 2 should not be construed as representing the actual sample utilized in the panel regression analysis (Alkire et al., 2023).

In Organizations Oxfam (2023) Poverty is a life that is prone to conflict and inequality. Some of the efforts made to deal with poverty are various long-term needs projects for people living in poverty, strengthening defense and security, protecting the rights and obligations of the community. PubMed Central (PMC) One of the causes of increasing poverty is due to the spread of Covid-19 which has hampered livelihoods, threatened human lives, affected trade, economies and businesses around the world (Zoundi, 2021). This is a challenge for every country as well as policies that must be faced specifically in these circumstances. As for the circumstances that must be faced in overcoming Covid-19, namely with investments provided in the long term and subsidized financing for treatment and health care for the underprivileged (Ahasan Ul Haque et al., 2021; Golam et al., 2021; Hojjat et al., 2023; Saha & Qin, 2023; Thach et al., 2022; Thu Pham & Hoai Nguyen, 2024).

Empirical research has yielded varied findings concerning the interplay between socioeconomic and institutional factors and poverty. In the context of financial inclusion, Saha & Qin (2023) identify a significant inverse relationship between financial inclusion and extreme poverty in developing nations, although this relationship lacks statistical significance in high-income countries. Similarly, studies on inflation reveal diverse outcomes across different economic settings. Acharya & Miah

(2021) document varying relationships between inflation and poverty across income groups, whereas Hassan et al. (2016) link rising inflation to increasing poverty levels. Concerning institutional quality, Olawumi et al. (2023) and Bijukchhen & Phaju (2023) highlight the association between corruption and poverty. Baktiar et al. (2020) additionally report variations in the statistical significance of this relationship over short-run and long-run periods. Evidence regarding investment exhibits variability across different studies. M. S. Hassan et al. (2021) demonstrate that portfolio investment correlates with poverty reduction in Pakistan in both the short and long term. In contrast, Nst et al. (2024) identify a negative and statistically significant relationship between domestic investment and poverty in Indonesia. These findings necessitate consideration of the variations in investment measures and the specific country contexts. Additionally, Ngubane et al. (2023) and Quy (2016) establish a positive relationship between unemployment and poverty. Research conducted by Hofmarcher (2021) underscores the significance of education in alleviating poverty.

Despite these contributions, the empirical evidence reviewed above remains dispersed across different explanatory variables, geographical settings, and research contexts. Most of the cited studies emphasize particular determinants or specific country settings, making it difficult to understand how economic, institutional, educational, financial, and labour-market factors jointly relate to poverty within a common cross-country framework. Moreover, the findings regarding inflation, corruption, financial inclusion, investment, and unemployment are not entirely consistent across the studies reviewed, suggesting that their relationships with poverty may vary according to country characteristics and time horizons. Therefore, further empirical investigation is needed to examine these six determinants simultaneously and to distinguish their short-run and long-run relationships with poverty within a comparable group of developing Asian countries.

Accordingly, this study aims to examine how inflation, control of corruption, tertiary education enrolment, financial inclusion, portfolio investment, and unemployment are jointly associated with poverty in 16 developing Asian countries over the period 2011–2022. Specifically, the study addresses the following research question: How do these six socioeconomic and institutional determinants relate to poverty in the short run and the long run? Using an unbalanced panel dataset, the study applies the REM for the reported long-run estimation and the ECM for the short-run estimation. The contribution of this study is to provide integrated cross-country panel evidence by examining the six determinants within a common empirical framework and comparing their relationships with poverty across different time horizons. These findings provide additional regional evidence to inform poverty-reduction policies concerning price stability, institutional governance, educational attainment, financial accessibility, investment, and employment conditions.

LITERATURE REVIEW

Conceptual Perspective on Poverty

Poverty can be understood through several distinct conceptual and measurement approaches, particularly monetary poverty, relative poverty, and multidimensional poverty. Although these approaches are interconnected, they represent different perspectives on deprivation and should not be treated as interchangeable concepts. Monetary poverty refers to a condition in which individuals or households have insufficient income or consumption to meet a specified monetary poverty threshold. In contrast, relative poverty is defined in relation to the prevailing standard of living and income distribution within a particular society. An individual may therefore be considered

relatively poor when their economic resources are substantially below the level required to participate fully in the living standards and social activities of their community (Decerf, 2023).

Multidimensional poverty extends beyond monetary deprivation by considering multiple dimensions of well-being, including health, education, and living standards (Wau, 2022). The Multidimensional Poverty Index (MPI), developed using the Alkire–Foster methodology, identifies individuals experiencing overlapping deprivations across several indicators within these dimensions (Alkire et al., 2023). Unlike monetary poverty measures, which primarily assess whether individuals fall below a specified income or consumption threshold, MPI provides a broader assessment of the multiple disadvantages experienced by poor households. Therefore, monetary poverty, relative poverty, and multidimensional poverty represent complementary but conceptually distinct approaches to understanding poverty.

In the context of this study, poverty is operationally defined as monetary poverty, measured by the poverty headcount ratio representing the percentage of the population living below the US$3.65-a-day poverty line. Consequently, the dependent variable captures the proportion of the population experiencing monetary deprivation rather than relative poverty or multidimensional deprivation. Although relative poverty and MPI provide important conceptual perspectives on the broader nature of poverty, they are not directly estimated in this study. This distinction ensures consistency between the theoretical discussion and the empirical measurement of poverty.

Theoretical Perspective on Poverty

First, the theory of poverty according to Michael P. Todaro & Smith (2012) on income level views, as follows:

> *Poverty is the life of a household whose income is below $1.25. The study explains that households' lack of income makes them unable to afford healthy food for consumption, expensive school fees and impacts the lives of ostracized communities*.

Second, the theory of poverty according to Amartya Sen (1983) in social and environmental views, as follows:

> *Poverty is not only seen from the income of the poor, which is less than two dollars. However, poverty is a consideration of the ability of the poor to fulfill a decent standard of living that is not possible and considers their social and environmental conditions.*

Third, the theory of poverty from a modern perspective according to Alkire et al. (2023) which explains poverty with the Alkire-Foster method, as follows:

> *Poverty is a problem that not only discusses decent living standards, education levels, and health, but poverty is a multidimensional problem that is divided by several indicators, including the economic dimension (average public consumption per capita), the health dimension (nutrition and childbirth assistance), the education dimension (school participation and preschool education), and the dimension of*

quality-of-life standards (housing assets, clothing, food and access to lighting sources).

Theoretical Mechanisms and Expected Relationships between the Determinants of Poverty

The relationship between poverty and its socioeconomic determinants can be explained through several interconnected economic mechanisms. In this study, six explanatory variables are incorporated into the empirical framework: inflation, control of corruption, tertiary education enrolment, financial inclusion, portfolio investment, and unemployment. Each variable represents a different dimension of economic welfare, institutional governance, human capital, financial accessibility, investment activity, and labour market conditions. The theoretical mechanisms underlying their relationships with monetary poverty are discussed below.

Inflation (INF) is theoretically expected to increase poverty by reducing the purchasing power of households. An increase in the general price level, particularly the prices of food and other essential goods, reduces the real value of household income, especially among low-income households that allocate a relatively large proportion of their expenditure to basic necessities. When nominal income does not increase proportionately with prices, households experience a decline in real consumption and may become unable to maintain their minimum living standards. This mechanism is consistent with the argument of Drewnowski & Specter, (2004), who emphasize the relationship between food costs and poverty-related consumption patterns. Previous empirical studies also identify relationships between inflation and poverty (Acharya & Miah, 2021; M. U. Hassan et al., 2016). Therefore, inflation is expected to have a positive relationship with poverty.

Control of corruption (CC) is theoretically expected to reduce poverty through improvements in institutional governance and the allocation of public resources. Effective corruption control can reduce the misuse of public funds, rent-seeking activities, and administrative inefficiencies, thereby improving the delivery of public services and the distribution of development resources. Better institutional accountability can also strengthen the effectiveness of government policies targeting vulnerable households. Conversely, weak corruption control may undermine public expenditure efficiency and restrict poor households' access to essential services and economic opportunities. Previous studies have examined the relationship between corruption and poverty, including Olawumi et al. (2023), Bijukchhen & Phaju (2023), and Baktiar et al. (2020). Accordingly, stronger control of corruption is expected to have a negative relationship with poverty.

Tertiary education enrolment (SEN) is expected to reduce poverty through human capital accumulation and improvements in labour productivity. Education enhances individuals' knowledge, skills, and competencies, potentially increasing their productivity and employment opportunities. Higher educational attainment may also improve access to better-paying occupations and strengthen individuals' capacity to adapt to changes in the labour market. From the human capital perspective, investment in education can therefore contribute to higher earning capacity and improved household welfare (Todaro & Smith, 2012). This argument is supported by empirical discussions concerning the role of education in poverty reduction (Hofmarcher, 2021). Consequently, tertiary education enrolment is expected to be negatively associated with poverty.

Financial inclusion (INK) is expected to reduce poverty by expanding households' access to formal financial services. Access to financial institutions and mobile financial service providers enables individuals to use savings, payment facilities, and other financial services that can support consumption management and economic activities. Financial inclusion may also help households manage financial shocks, accumulate financial assets, and obtain resources for productive activities. Demirgüç-Kunt & Klapper (2012) emphasize the importance of access to financial services in measuring financial inclusion. Previous research also identifies a negative relationship between financial inclusion and poverty, particularly in developing economies (Erlando et al., 2020; Hojjat et al., 2023; Saha & Qin, 2023). Therefore, financial inclusion is expected to have a negative relationship with poverty.

Portfolio investment (PI) may influence poverty through capital market development, financial resource allocation, and broader economic activity; however, its expected direction is theoretically ambiguous. Portfolio investment can contribute to financial market development by increasing the availability of investment capital and supporting financial intermediation. Under favourable conditions, these developments may support economic expansion and indirectly improve employment and household income. Nevertheless, portfolio investment does not necessarily generate direct productive capacity or employment opportunities in the same manner as investment in physical capital. Moreover, volatile capital flows and sudden withdrawals may create financial instability, potentially weakening economic conditions and adversely affecting vulnerable households. Previous studies have discussed investment and poverty relationships in different national contexts (M. S. Hassan et al., 2021; Nst et al., 2024). However, differences in investment measures and economic settings suggest that the relationship should be examined empirically rather than assigned an unconditional expected sign.

Unemployment (UNM) is expected to increase poverty through reductions in household labour income and consumption capacity. Employment provides a primary source of income for many households, particularly those that depend on wages and salaries to meet their basic needs. When individuals become unemployed, their earnings decline or disappear, reducing household purchasing power and increasing the risk of falling below the monetary poverty threshold. Prolonged unemployment may also weaken workers' skills and reduce their future employment prospects. This relationship is consistent with the arguments of Paul (1989) and the Keynesian perspective discussed by Prasetyo & Cahyani (2022). Previous empirical studies also highlight the relationship between unemployment and poverty (Ngubane et al., 2023; Quy, 2016). Thus, unemployment is expected to have a positive relationship with poverty.

This framework provides the theoretical basis for examining both short-run and long-run relationships between the six determinants and poverty. It also allows the empirical analysis to investigate whether the relationships differ across time horizons, reflecting potential differences in the adjustment of household welfare to changes in economic, institutional, financial, and labour market conditions.

RESEARCH METHOD

Sample Selection and Data Availability

This study initially considered a potential sample of 192 country-year observations, comprising 16 developing countries in Asia over the 2011–2022 period. However, the final dataset consisted of an *unbalanced* panel due to differences in data availability across countries, years, and indicators. After standardizing the analytical dataset, 144 observations were retained for descriptive analysis and long-run panel estimations.

Short-run estimates subsequently used 113 observations after applying the transformations required by the Error Correction Model (Ashley et al., 2011; Tobigo et al., 2023 and Widarjono, 2018). The reduction in the number of observations was due to missing observations in the selection of sample countries and the determination of included years, which resulted in an unbalanced dataset. To ensure transparency, the year-country data availability matrix is presented in Table 13, which identifies the observations available for each country during the study period. Data coverage and exclusion criteria are also reported to clarify the formation of the unbalanced panel and the effective estimation sample. The following research data is presented in the form of table 1 below:

Table 1. Operational Definition of Variables

	Description	Source	Measurement Scale
Variabel Dependen			
Poverty (PH)	*Poverty Headcount 3,65 per day (% Population)*	World Development Indicators	$P_{\propto}=\frac{1}{n}\sum_{i-1}^{q}\left[\frac{z-y_i}{z}\right]^{\propto}$
Variabel Independen			
Inflation (INF)	*Consumer Price Index (CPI) (% Annual)*	World Development Indicators	$LPI=\frac{\sum_{i=1}^{n} p_{it}q_{io}}{\sum_{i=1}^{n} p_{io}q_{io}}x100$
Corruption (CC)	*Control of Corruption – Governance Score (0-100)*	World Governance Index	Index (0-100)
Education (SEN)	*School Enrolment, Tertiary (% Gross)*	World Development Indicators	$S_i=\frac{X_i-\min(X_i)}{\max(X_i)-\min(X_i)}$
Financial Inclusion (INK)	*Account ownership at a financial institution or with a mobile-money-service provider (% of population ages 15+)*	World Development Indicators	$d_i=w_i\frac{A_i-m_i}{M_i-m_i}$;i=1,2,3
Investment Portfolio (PI)	*Investment Portfolio (BoP Current US$)*	World Development Indicators	$E(R)=\sum_{i=1}^{n} R_i pr_i$
Unemployment (UNM)	*Unemployment (% Population)*	World Development Indicators	$TPT=\frac{JM}{JAK}\ x\ 100\%$

Source : World Development Indicator and author compilation.

Data analysis technique

Descriptive statistics are carried out by providing a descriptive description of the data seen from the average, maximum, minimum, and standard deviation values and the Skewness and Jarque-Bera values at the normality level. In addition, the panel data regression model is a regression model that combines *time-series* and *cross-section* data. The advantage obtained by using panel data is that it produces a degree of freedom and overcomes problems when there is an *omitted-variable* problem. However, this study uses panel data that is not balanced between time series and cross-section data (Widarjono, 2018). These are some of the methods used in panel data regression as follows.

The common effect (CE) model is a model of combining all time series data and cross section data with processed panel data (Ashley et al., 2011). With the following equation:

$$PH_{it}=\beta_0+\beta_1 INF_{it}+\beta_2 CC_{it}+\beta_3 SEN_{it}+\beta_4 INK_{it}+\beta_5 PI_{it}+\beta_6 UNM_{it}+\varepsilon_{it} \quad \text{(i)}$$

The fixed effect (FE) model is a panel data estimation model using dummy variables to capture intercept differences in the fixed effect equation or this model is often called the Least Square Dummy Variable (LSDV) technique (Ashley et al., 2011). The formula equation is as follows:

$$PH_{it}=\alpha+\sum_{k=1}^{k}\beta_k X_{k_{it}}+d_{it}\,, \quad \text{Untuk } i=1,2,\cdots,N;t=1,2,\cdots,T;k=1,2,\cdots,k \quad \text{(ii)}$$

The random effect (RE) model is a model using the Generalized Least Square (GLS) process by taking into account the error value, cross section and time series (Ashley et al., 2011). The formula equation is as follows:

$$PH_{it}=\beta_0+\beta_1 INF_{it}+\beta_2 CC_{it}+\beta_3 SEN_{it}+\beta_4 INK_{it}+\beta_5 PI_{it}+\beta_6 UNM_{it}+v_{it} \quad \text{(iii)}$$

Where, v_{it} is a disturbance variable consisting of two components, namely a combination of time-series and cross-section variables and individual disturbance variables (e_{it}). As in this case the disturbance variable μ_i i.e. the sample of individuals is different but fixed across time (Widarjono, 2018). There are several best models used after using the common effect model, fixed effect model, and random effect model methods as follows.

ECM Model Analysis Technique

This study employs a quantitative approach using panel data regression to examine the relationships between inflation, control of corruption, tertiary education enrolment, financial inclusion, portfolio investment, unemployment, and poverty in 16 developing Asian countries during the period 2011–2022. The empirical analysis applies the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) to identify the appropriate panel specification. Model selection is conducted using the Lagrange Multiplier, Chow, and Hausman tests. Classical diagnostic tests are subsequently employed to assess the statistical properties of the estimated model. Given the cross-country and time-series dimensions of the dataset, additional

diagnostic considerations are undertaken to assess potential dependence across countries and the time-series properties of the variables. This study uses the Error Correction model (ECM) with panel data. ECM is a model used to see the short-term influence between the independent variable and the dependent variable (Seetaram et al., 2012; Kais & Sami, 2016 dan Widarjono, 2018).

The ECM method developed in this study is the model of Domowitz & Elbadawi, (1987). The ECM model according to Domowitz & Elbadawi is a model used when there is an imbalance in the condition of each independent variable on the dependent variable. This shows that the theoretical model by Domowitz & Elbadawi can be said to be valid if the Error Correction Term (ECT) coefficient is positive, and statistically significant.

Error Correction Term (ECT) is a condition where each independent variable on the dependent variable occurs due to an imbalance condition (shock variable) in the time series (Widarjono, 2018). The econometric ECT formula is written as follows:

$$EC_t=Y_t^*-\alpha_0-\alpha_1 Y_t \quad \text{(iv)}$$

The estimation of the Error Correction Model (ECM) in econometrics is formulated as follows:

$$\Delta PH_t=\beta_0+\beta_1\Delta INF_t+\beta_2\Delta CC_t+\beta_3\Delta SEN_t+\beta_4\Delta INK_t+\beta_5\Delta PI_t+\beta_6\Delta UNM_t+\beta_7 EC_t+\varepsilon_t \quad \text{(v)}$$

Where notation Δ is the asymptotic distribution (change or difference in relationship) of the random variable, *β* is *intersep*, EC = *Error correction* and *t* = time/period.

RESULTS

Summary and Descriptive Statistics

Descriptive statistics are employed to summarize the characteristics and distribution of the variables used in this study. Table 2 presents the mean, median, maximum, minimum, standard deviation, skewness, kurtosis, and Jarque–Bera statistics for the seven research variables. The reported descriptive statistics consist of 144 observations for each variable (Sugiyono, 2017).

Table 2. Descriptive Statistics

	PH	INF	CC	SEN	INK	PI	UNM
Mean	16.479	5.142	39.864	43.640	53.464	-3959799107.9	5.749
Median	13.15	4.147	38.717	41.381	52.915	-83813076.2	4.427
Max	63.1	19.596	77.404	125.764	98.460	66470061883	19.653
Min	0.03	-1.138	6.635	7.461	3.76	-106874000000	0.249
Std. Dev.	15.254	3.662	15.690	22.678	24.786	18095953081	4.390
Skewn.	0.969	1.115	0.359	1.257	-0.039	-1.884	1.227
Kurtosis	3.349	4.752	3.053	5.394	1.791	13.966	3.977
Jarque-Bera	23.265	48.242	3.118	72.355	8.804	806.699	41.872
Prob	0.000	0.000	0.210	0.000	0.012	0.000	0.000

Sum	2373.11	740.4285	740.4226	284.2297	698.78	-570211	071536827.857
Sum Sq. Dev.	33277.7	1917.8	35204.5	73547.4	87855.3	4.682728	2756.6
Obs	144	144	144	144	144	144	144

Source: Secondary data, data processed

The poverty headcount ratio (PH) has a mean of 16.479%, with a standard deviation of 15.254, indicating considerable variation in poverty levels across the observed country-year records. Its values range from 0.03% to 63.10%. Inflation (INF) records an average of 5.142%, with a minimum of −1.138% and a maximum of 19.596%. Meanwhile, control of corruption (CC) has a mean of 39.864, with values ranging from 6.635 to 77.404. Tertiary education enrolment (SEN) has an average of 43.640%, while financial inclusion (INK) records a mean of 53.464%, indicating differences in educational participation and access to formal financial services across the observations.

Portfolio investment (PI), expressed in billions of current US dollars, exhibits both negative and positive values, with a mean of −3.960 billion US dollars and a median of −0.084 billion US dollars. Its values range from −106.874 billion to 66.470 billion US dollars, with a standard deviation of 18.096 billion. The negative skewness (−1.884) and relatively high kurtosis (13.966) indicate a left-skewed distribution with heavy tails. These characteristics reflect substantial variation in net portfolio investment flows across the observations. Finally, unemployment (UNM) records an average of 5.749%, with values ranging from 0.249% to 19.653%.

The Jarque–Bera statistics provide additional information about the distributional characteristics of the individual variables. At the 5% significance level, the null hypothesis of normality is rejected for poverty, inflation, tertiary education enrolment, financial inclusion, portfolio investment, and unemployment. In contrast, the null hypothesis is not rejected for control of corruption, which has a probability value of 0.210. These results indicate that most variables do not follow a normal distribution. Nevertheless, the Jarque–Bera results reported in Table 2 concern the marginal distributions of the individual variables and should not be interpreted as evidence regarding the normality of the regression residuals. Overall, the descriptive statistics highlight substantial cross-country variation in poverty and its socioeconomic and institutional determinants. This analysis is in line with the approach taken by the study Baktiar et al., (2020); Olawumi et al., (2023); Perera & Lee, (2013) and Ojo et al., (2020).

Long-Term Estimation Results

After testing the descriptive statistics, the next step is to estimate the long-term panel data regression by selecting the best model, namely the Common Effect Model, Fixed Effect Model, and Random Effect Model by applying the Generalized Least Square model. The long-term regression is a model to determine the symptoms or impact between the independent variable and the dependent variable in more than one period (Ashley et al., 2011; Sugiyono, 2017 and Widarjono, 2018). The long-term regression estimation results are presented in Table 3 below.

Table 3. Long-Term Regression Test Results

Variable	*Common Effect*	*Fixed Effect*	*Random Effect*
Constant	32.449***	33.313***	29.218***
	(0.000)	(0.000)	(0.000)
Inflation	0.819***	0.275	0.356
	(0.006)	(0.219)	(0.102)
Control of Corruption	-0.021	-0.162	-0.102
	(0.804)	(0.123)	(0.254)
School Enrolment, Tertiary	-0.467***	-0.232***	-0.255***
	(0.000)	(0.001)	(0.000)
Financial Inclusion	-0.117**	-0.021	-0.036
	(0.014)	(0.643)	(0.399)
Portofolio Investment	-8.71E-11*	2.20E-11	1.63E-11
	(0.091)	(0.506)	(0.619)
Unemployment	1.211***	-0.077	0.332
	(0.000)	(0.876)	(0.363)
R-squared	0.497	0.864	0.211
Prob (F-Statistic)	0.000	0.000	0.000
Observation	144	144	144

Notes: **,*** indicates significant level of 0.05, and 0.01.
Source: Secondary data, data processed

Based on table 3, the Common Effect Model test estimation shows that inflation, education, financial inclusion, investment portfolio and unemployment affect the poverty rate. In addition, the Fixed Effect Model shows that weak education can affect the poverty rate in developing Asian countries over the long term, and the Random Effect Model also shows the results that over the long term low education rates can significantly affect the increase in poverty. There are several studies that confirm the regression test results in table 3 above which argue that there is a significant influence between inflation, corruption control, education, financial inclusion, investment and unemployment on poverty such as (Acharya & Miah, 2021; Bratasanu, 2017; Hofmarcher, 2021; Ojeyinka & Ibukun, 2024; Olawumi et al., 2023; Saha & Qin, 2023).

Selection of the Best Estimation Model

At the next stage, this research will select the best estimation model in the Langrange-Multiplier, Chow and Hausman tests. In the testing stage, it is carried out to test the dynamic panel data unbalanced observation (Widarjono, 2018). The results of this study are presented in tables 4, 5 and 6 below.

Table 4. Lagrange Multiplier Test

	Test Hypothesis		
	Cross-section	**Time**	**Both**
Breusch-Pagan	211.7278	0.202041	211.9299
	(0.0000)	(0.6531)	(0.0000)
Honda	14.55087	-0.449490	9.971182
	(0.0000)	(0.6735)	(0.0000)
King-Wu	14.55087	-0.449490	8.960878

	(0.0000)	(0.6735)	(0.0000)
Standardized Honda	18.34909	-0.250226	7.827656
	(0.0000)	(0.5988)	(0.0000)
Standardized King-Wu	18.34909	-0.250226	6.597029
	(0.0000)	(0.5988)	(0.0000)
Gourieroux, et al.	--	--	211.7278
			(0.0000)

Source: Secondary data, data processed.

From table 4 above, the probability <0.05 is obtained, so the results obtained from the LM test are Random Effect Model (REM).

Table 5. Chow Test

Effects Test	Statistic	d.f.	Prob.
Cross-section F	21.944199	(15,122)	0.000
Cross-section Chi-square	188.324299	15	0.000

Source: Secondary data, data processed.

Furthermore, in the Chow test in table 5, it is known that the probability value is 0.000 <0.05, these results indicate that the model is a Fixed Effect Model (FEM).

Table 6. Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	10.596138	6	0.102

Source: Secondary data, data processed.

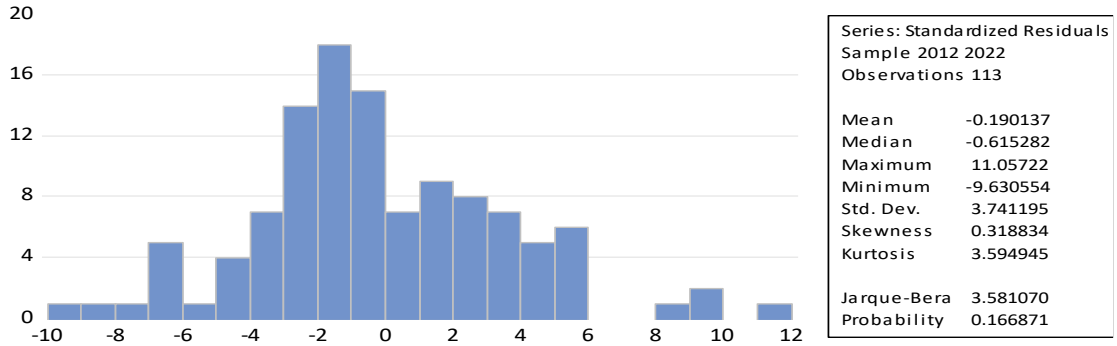
The Hausman test results presented in Table 6 show a chi-square statistic of 10.596 with six degrees of freedom and a probability value of 0.102. Since the probability value exceeds the conventional 5% significance level, the null hypothesis cannot be rejected. This indicates that there is insufficient statistical evidence to conclude that the differences between the Fixed Effects Model (FEM) and Random Effects Model (REM) estimates are systematic. Therefore, the REM is selected as the preferred specification based on the conventional model selection procedure. This selection is further supported by the Lagrange Multiplier test, which rejects the pooled model in favour of the random effects specification, while the Chow test indicates that country-specific effects should be considered rather than relying on a pooled regression model. Taken together, these results provide a statistical basis for retaining the REM as the preferred baseline specification.

From an economic perspective, the REM accounts for unobserved country-specific heterogeneity among the 16 developing Asian countries, including persistent differences in geographical conditions, structural economic characteristics, and historical development patterns. However, the consistency of the REM depends on the assumption that these unobserved country-specific effects are not systematically correlated with the explanatory variables, namely inflation, control of corruption, tertiary education enrolment, financial inclusion, portfolio investment, and

unemployment. The Hausman test does not establish this assumption conclusively; it only indicates that the null hypothesis cannot be rejected at the conventional significance level. Accordingly, additional specification diagnostics, particularly the Mundlak correlated random effects approach, are relevant to assess the robustness of this assumption. The REM is therefore interpreted as the preferred baseline specification subject to the validity of its underlying assumptions (Widarjono, 2018; Ojeyinka & Ibukun, 2024).

Classical Assumption Test Results

Table 7. Normality Test



Source: Secondary data, processed data

Based on the normality test results in table 7 above, it can be seen that the data from the study is normally distributed with a probability value of 0.166871> 0.05. This is also explained by Widarjono, (2018) states that a normally distributed graph shows a bell-shaped slope.

Table 8. Variance Test of Inflation Factor

Correlation	PH	INF	CC	SEN	INK	LPI	UNM	VIF
PH	1							
INF	0.011	1						**1.390**
CC	-0.166	-0.236	1					**2.085**
SEN	-0.546	0.363	0.280	1				**1.737**
INK	-0.447	-0.099	0.466	0.359	1			**1.595**
PI	-0.114	0.028	-0.064	0.019	0.009	1		**1.008**
UNM	0.045	0.131	0.512	0.441	0.067	-0.006	1	**1.822**

Source: Secondary data, data processed

In table 8 above, the multicollinearity test explains that the value of each variable is less than 10. As the value of inflation has a VIF value of 1.390, corruption control has a value of 2.085, while the VIF value of School Enrolment, Tertiary (SEN) is 1.737, the VIF value of financial inclusion is 1.595, the VIF value of the investment portfolio is 1.008 and the VIF value of Unemployment (UNM) is 1.822. In addition, the highest correlation value is found in the unemployment and corruption control variable of 0.512, while the lowest correlation is found in the education and poverty variable of -0.546. So it can be concluded that all independent variables have a value of less than 10, meaning that the data has a classic assumption of multicollinearity or no multicollinearity symptoms occur.

Table 9. Glejser Test

Heteroskedastisitas Metode Glejser			
F-statistic	0.948	Prob. F(6,109)	0.464
Obs*R-squared	5.755	Prob. Chi-Square(6)	0.451
Scaled explained SS	8.795	Prob. Chi-Square(6)	0.185

Source: Secondary data, data processed.

Table 10. Breusch-Pagan-Godfrey Test

Heteroskedastisitas Metode Breusch-Pagan-Godfrey			
F-statistic	0.261	Prob. F(6,109)	0.954
Obs*R-squared	1.643	Prob. Chi-Square(6)	0.949
Scaled explained SS	10.409	Prob. Chi-Square(6)	0.108

Source: Secondary data, data processed.

Table 11. White Test

Heteroskedastisitas Metode White			
F-statistic	0.309	Prob. F(27,19)	0.999
Obs*R-squared	10.043	Prob. Chi-Square(27)	0.998
Scaled explained SS	63.599	Prob. Chi-Square(27)	0.000

Source: Secondary data, data processed

The heteroskedasticity diagnostics are evaluated using the Glejser, Breusch–Pagan–Godfrey, and White tests. The results of the Glejser test in Table 9 indicate that all reported probability values exceed the 5% significance level, suggesting insufficient statistical evidence of heteroskedasticity under the specified test. Similarly, the Breusch–Pagan–Godfrey results in Table 10 show probability values above 0.05, indicating that the null hypothesis of homoskedasticity cannot be rejected (Breusch & Pagan, 1979; Glejser, 1969; White, 1980).

The White test results in Table 11 require a more cautious interpretation. Although the F-statistic and Obs*R^2 probability values are above 0.05, the Scaled Explained Sum of Squares statistic reports a probability value below 0.001. This divergence indicates that the diagnostic evidence is not entirely consistent. Consequently, the results do not support an unconditional conclusion that the model is free from heteroskedasticity or other forms of specification problems. Further verification using residuals from the final panel estimation and an estimator-appropriate covariance specification is necessary before drawing a definitive conclusion.

Table 12. Auto Correlation Test

Statistical status	**Prob.**
Durbin-Watson stat	1.787097
DL	1.60206
4-DL	2.39794
DU	1.78644
4-DU	2.21356
Obs	113

Source: author compilation

Table 12 reports a Durbin–Watson statistic of 1.787097. Although this value falls within the conventional no-autocorrelation region based on the reported Durbin–Watson bounds, this result should be interpreted cautiously. The conventional Durbin–Watson test is not sufficient to establish the absence of serial correlation in a dynamic panel specification containing a lagged dependent variable. Therefore, a panel-appropriate serial-correlation diagnostic must be employed in accordance with the actual estimation procedure. Specifically, the Wooldridge test is suitable for conventional static fixed-effects or random-effects panel specifications, whereas the Arellano–Bond AR(1) and AR(2) tests are required when a dynamic panel GMM estimator is employed. Accordingly, the Durbin–Watson statistic is not treated as definitive evidence that the dynamic panel model is free from serial correlation.

Short-Term Estimation Results

The final result of this study presents the results of the Error Correction Model regression to determine the short-term impact by adding the Error Correction Term (ECT) variable to see the interference between time series (Widarjono, 2018). As presented in table 13 below, as follows:

Table 13. Short-Term Regression Test Results

Variable	***Error Correction Model***
	Short Term
Constant	8.953***
	(0.000)
Poverty Headcount (-1)	-0.607***
	(0.000)
Inflation	-0.184**
	(0.017)
Control of Corruption	0.085
	(0.108)
School Enrolment, Tertiary	-0.142***
	(0.000)
Financial Inclusion	-0.031**
	(0.039)
Portofolio Investment	1.06E-11
	(0.275)
Unemployment	-0.048
	(0.852)
ECt	0.724***
	(0.000)
R-squared	0.732
Prob (F-Statistic)	0.000
Observation	113
Number of Instruments	16

Notes: **,*** indicates significant level of 0.05, and 0.01.
Source: Secondary data, data processed

Table 13 presents the reported short-run estimation results for the relationships between poverty and six socioeconomic and institutional determinants in 16 developing Asian countries. The results indicate that only three of the six explanatory variables are statistically significant at the 5% level, namely inflation, tertiary education enrolment, and financial inclusion. Specifically, inflation and tertiary education enrolment exhibit statistically significant negative coefficients, while financial

inclusion also demonstrates a negative and statistically significant association with poverty. In contrast, control of corruption, portfolio investment, and unemployment do not show statistically significant relationships with poverty in the reported short-run specification. These findings indicate that the relationships between socioeconomic determinants and poverty vary across explanatory variables and do not uniformly support the expected theoretical directions. The following discussion examines each variable in relation to its theoretical foundation and previous empirical evidence.

First, Inflation and Poverty. The short-run estimation reveals that inflation has a negative and statistically significant relationship with poverty (β = −0.184; p = 0.017), indicating an inverse association between inflation and poverty in the estimated model. This finding contrasts with the theoretical argument of Drewnowski & Specter, (2004), which suggests that rising food prices can reduce the purchasing power of low-income households and influence their consumption choices. Previous studies, including Acharya & Miah (2021); Azam et al. (2016); Danlami et al. (2020); M. U. Hassan et al. (2016) and Khan (2023), also highlight the relationship between inflation and poverty, generally emphasizing the potential adverse consequences of rising prices. However, the negative coefficient obtained in this study does not support the expected positive association between inflation and poverty. This unexpected finding may reflect differences in country-specific economic conditions and inflation dynamics across the sample. Therefore, the result should be interpreted as a statistically significant negative short-run association rather than evidence that inflation increases poverty or necessarily reduces household deprivation.

Second, the corruption control variable is not in line with the theory expressed by Rose–Ackerman (1998, 2008) which states that the lack of control over corruption in a country greatly affects poverty. This is because there are many acts of disobedience and exploitation of authority that make government regulations difficult to trust among the people. In addition, this finding cannot be confirmed by research by Baktiar et al., (2020), Olawumi et al., (2023) and Perera & Lee, (2013) which both state that there is a significant positive influence between the level of corruption and the increase in poverty. In another argument, this finding is confirmed by Ojo et al., (2020) which argues that corruption has an insignificant positive effect on poverty, this argument implies that the need for an active role of a policy in prioritizing in dealing with corruption cases. Similarly, research Ellis, (2012) which indicates that the main cause of poverty is not corruption, but rather poverty itself which is facilitated through a decline in public services in terms of the quality and quantity of education, housing, health, and so on enjoyed by the wider community.

Third, Tertiary Education Enrolment and Poverty. The tertiary education variable has a negative and statistically significant coefficient (β = −0.142; $p < 0.001$), indicating that higher tertiary education enrolment is associated with lower poverty in the short run. This finding is consistent with the human capital perspective of Todaro & Smith, (2012), which emphasizes the importance of educational participation in expanding individuals' opportunities for socioeconomic advancement. Tertiary education enrolment reflects the extent of participation in higher education and may provide opportunities for individuals to acquire knowledge and skills that can improve their future employment prospects and earning potential. Furthermore, Ladd (2012) emphasizes that educational outcomes are influenced by the quality of public education and the surrounding socioeconomic context. However, the present study measures educational participation rather than educational quality, learning outcomes, or individual productivity. The negative relationship found

in this study is broadly consistent with previous research by Hofmarcher (2021) and Rasyid et al. (2020), which highlights the role of educational development in poverty reduction. Therefore, the findings suggest that greater participation in tertiary education is associated with lower poverty, although the extent to which this relationship translates into improved skills, productivity, and employment opportunities cannot be directly established from the enrolment indicator alone.

Fourth, Financial Inclusion and Poverty. Financial inclusion is theoretically expected to reduce poverty by expanding access to formal financial services, including savings, credit, and payment facilities (Demirgüç-Kunt & Klapper, 2012). In this study, financial inclusion is measured by account ownership at a financial institution or with a mobile-money-service provider, which captures financial access and account ownership rather than the actual frequency or intensity of financial service usage. The short-run estimation reveals a negative and statistically significant relationship between financial inclusion and poverty (β = −0.031; p = 0.039), suggesting that greater account ownership is associated with lower poverty in the short run. This finding is consistent with previous studies by Inoue, (2019), Li, (2018), Erlando et al., (2020) and Thu Pham & Hoai Nguyen, (2024), which highlight the potential contribution of financial inclusion to poverty reduction. However, the long-run Random Effects Model reports an insignificant relationship (p = 0.399), indicating that the negative short-run association is not statistically established in the long run. These findings suggest that expanding access to financial accounts may support poverty alleviation, although account ownership alone does not necessarily guarantee the effective use of financial services or directly demonstrate improvements in household welfare. Therefore, policies aimed at reducing poverty should focus not only on expanding account ownership but also on improving the accessibility and effective utilization of financial services, particularly among low-income households and underserved communities (Neaime & Gaysset, 2018 and Nsiah et al., 2021).

Fifth, Portfolio Investment and Poverty. The estimation results indicate that portfolio investment has a positive but statistically insignificant relationship with poverty in both the long run (β = 1.63 × 10^{-11}; p = 0.619) and the short run (β = 1.06 × 10^{-11}; p = 0.275). These findings suggest that the reported estimations do not provide sufficient statistical evidence of an association between portfolio investment and poverty in developing Asian countries. Although investment can theoretically contribute to economic development through capital allocation and financial market development, portfolio investment does not necessarily translate directly into productive capacity, employment creation, or improvements in household welfare. This distinction is important because portfolio investment, as measured by net balance-of-payments flows, differs from domestic productive investment, household savings, and microfinance activities. Previous studies, including Nizar et al., (2013), M. S. Hassan et al., (2021) and Nst et al., (2024), discuss investment and poverty relationships in different economic and institutional contexts. However, their findings cannot be directly generalized to the portfolio investment measure employed in this study. Therefore, the positive coefficients obtained in both estimations should not be interpreted as evidence that portfolio investment increases poverty. Instead, the statistically insignificant results indicate that its relationship with poverty remains inconclusive within the empirical specifications examined.

Sixth, Unemployment and Poverty. The estimation results indicate that unemployment has a positive but statistically insignificant relationship with poverty in the long run (β = 0.332; p = 0.363), while its short-run coefficient is negative and statistically insignificant (β = −0.048; p = 0.852). These

findings do not provide sufficient statistical evidence to establish a significant relationship between unemployment and poverty in either time horizon. Theoretically, unemployment is generally expected to increase poverty because the loss of employment can reduce household income and weaken the ability to meet basic consumption needs, as discussed by Paul (1989) and Prasetyo & Cahyani (2022). Previous studies, including Quy (2016), Bijukchhen & Phaju, (2023) and Ngubane et al., (2023), also identify a positive relationship between unemployment and poverty. However, the findings of the present study do not consistently support these previous results. The lack of statistical significance may reflect differences in labour market conditions across countries, including informal employment, underemployment, household income diversification, and social protection mechanisms that may influence the relationship between unemployment and poverty. Nevertheless, these factors are potential explanations rather than mechanisms directly tested in this study. Therefore, the results should be interpreted as insufficient evidence of a statistically significant relationship, rather than proof that unemployment has no relevance to poverty alleviation.

CONCLUSION

This study examines the determinants of poverty in 16 developing Asian countries during 2011–2022. The results show that tertiary education enrolment has a negative and statistically significant relationship with poverty in both the long and short run. In the short run, inflation and financial inclusion also exhibit negative and significant relationships with poverty, although inflation's negative association differs from theoretical expectations. Meanwhile, control of corruption, portfolio investment, and unemployment are statistically insignificant in both estimation specifications. These findings highlight the importance of educational participation and financial inclusion in poverty alleviation, while emphasizing the need for further research to better understand the relationship between economic and institutional factors and poverty in developing Asian countries.

This indicates that actions to control corruption that have not been properly realized are an impact that hinders poverty alleviation, slows down development, lacks trust, and can increase foreign debt and much more. In addition, findings from tertiary education on poverty prove that the higher the level of education in a country can help reduce poverty in the country, this is also evidenced by the increase in the workforce, is able to increase domestic productivity through individual skills and understanding, provides greater opportunities in the world of work and much more. From the perspective of the findings of financial inclusion on poverty, it contributes and explains that financial inclusion as measured through the use of mobile account services can have a positive impact on the country in reducing poverty. By expanding the network of financial access services in each region, increasing accessibility and efficiency in payment and loan systems, as well as developing financial services that are easily accessible and affordable and so on. In addition, the investment portfolio on poverty explains that the investment portfolio could have a significant positive effect on poverty, namely due to several factors, including the lack of quality of microfinance banks both financially and socially, the importance of special attention from microfinance banks to the social environment by prioritizing the role of credit and loans, inadequate investment networks, and other

activities that have not been able to contribute more to improving the welfare of the poor. And the final conclusion, regarding unemployment and poverty indicates that the number of unemployed has a very significant positive effect on increasing poverty in developing countries in Asia. It is important to note that attention is needed to the high unemployment rate by opening up adequate employment opportunities, and the authorities provide certificates for non-workers to contribute to pre-employment training, which can help the country reduce poverty.

Appendix

Table A1. List of names - names of 16 developing countries in Asia

No	Countries	Information	No	Countries	Information
1	Myanmar	Developing	9	Georgia	Developing
2	Turkey	Developing	10	Malaysia	Developing
3	Sri Lanka	Developing	11	Kyrgyz	Developing
4	Viet Nam	Developing	12	Thailand	Developing
5	Philippines	Developing	13	Pakistan	Developing
6	Indonesia	Developing	14	Mongolia	Developing
7	Kazakhstan	Developing	15	India	Developing
8	China	Developing	16	Armenia	Developing

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