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GDP Composition and Poverty: Evidence from Cross-Country Data

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ABSTRACT

This study examines whether the expenditure composition of gross domestic product (GDP) is systematically associated with poverty across countries, beyond the role of GDP levels alone. Using cross-country data from the World Bank's World Development Indicators for the period 2000–2024, the study analyzes the relationship between poverty rates and the shares of consumption, investment, government spending, and net exports in GDP. The empirical approach combines descriptive statistics, Pearson correlation analysis, and ordinary least squares regression based on long-run country averages, with log GDP per capita included as a control variable. The results indicate that countries with higher consumption shares tend to have higher poverty rates, while net export shares are negatively associated with poverty in bivariate analysis. However, after controlling income differences, the association between net exports and poverty becomes positive. Investment and government spending shares show weaker and less consistent relationships with poverty. Overall, the findings suggest that income remains the dominant factor associated with cross-country poverty differences, while GDP composition provides additional structural information related to poverty outcomes. The results should be interpreted as cross-country associations rather than causal effects.

Keywords:
Cross-Country Analysis
Expenditure Shares
GDP Expenditure
GDP per Capita
Poverty

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Introduction

Economic development is commonly evaluated using aggregate measures such as gross domestic product (GDP) per capita [1], [2]. While GDP levels provide a useful summary of economic activity, they conceal important differences in how output is allocated across countries. Economies with similar GDP levels may differ substantially in their expenditure structure, reflecting variation in consumption behavior, investment intensity, government involvement, and external orientation. These differences in GDP composition may have meaningful implications for development outcomes, including poverty.

Poverty remains a central concern in development economics because it directly reflects living standards and economic vulnerability [3]. In simple terms, poverty is "not having enough money or access to resources to enjoy a decent standard of living be that the lack of access to healthcare, education or water and sanitation facilities" [4]. High poverty rates are associated with limited access to essential services, such as health care, education, and basic infrastructure, and they can constrain long term economic potential by weakening human capital formation and productivity [3], [5], [6].

From a macroeconomic perspective, poverty can also be viewed as a consequence of unequal access to productive resources, including physical capital and human capital, which restricts economic participation and income generating opportunities [7]. Related research emphasizes that low education and limited access to information can reduce the ability of poor households to move out of poverty and can transmit disadvantages across generations. These mechanisms make poverty not only an outcome of development, but also a constraint on future growth and efficiency [6], [8].

This paper examines whether the composition of GDP is systematically related to poverty across countries. Rather than focusing on GDP levels or growth alone, the analysis investigates the correlation between poverty and the expenditure shares of consumption, investment, government spending, and net exports. Each component represents a different macroeconomic channel. Investment spending may be linked to poverty through capital accumulation and productivity growth, government spending may be related to poverty through public services and redistribution, consumption shares may reflect both household welfare and structural constraints, and net exports may capture external demand and trade orientation.

The central research question of the paper is how the shares of consumption, investment, government spending, and net exports in GDP relate to poverty across countries. To address this question, the study documents the direction and strength of these associations using descriptive comparisons, pairwise correlations, and multivariate regression analysis.

The goal is to identify which GDP component shares are most strongly associated with poverty outcomes within a unified empirical framework, without making causal claims.

Because poverty is mechanically and economically linked to overall income levels, failing to account for GDP per capita would confound structural expenditure effects with differences in development levels [9]. Therefore, the empirical analysis includes GDP per capita as a control variable to isolate whether expenditure composition contains information about poverty beyond income differences.

A. Conceptual Framework & Economic Intuition

1. GDP Expenditure Decomposition

GDP is widely used as a central indicator of economic development and macroeconomic performance. GDP is a key measure for development analysis, and for policy purposes it is especially important to understand real GDP dynamics, since real GDP is intended to reflect changes in actual economic activity rather than price movements [10]. In a similar spirit, Kaminitz argues that GDP per capita is often interpreted as a broad proxy for societal well-being because it reflects the extent of economic opportunities available to pursue valued, purchasable goals, even if it does not fully capture individual welfare directly [11]. These perspectives motivate the use of GDP as a benchmark, but they also point to a limitation of it, where GDP aggregates output without revealing how that output is allocated within the economy.

From a macroeconomic accounting perspective, GDP can be expressed as the sum of four expenditure components

$$GDP=C+I+G+(X-M) \quad (1)$$

where:

$C = Consumption\ Expenditure$
$I = Gross\ Capital\ Formation\ (Investment)$
$G = Government\ Final\ Consumption\ Expenditure$
$(X - M) = Net\ Exports$

While this identity holds mechanically, its economic significance lies not only in the size of output but in how output is used. Economies with similar GDP levels can exhibit substantially different expenditure structures, reflecting variation in consumption patterns, investment capacity, government involvement, and external orientation. For this reason, rather than focusing on absolute GDP levels, this study emphasizes expenditure shares, each component expressed as a proportion of GDP. Differences in expenditure composition may reflect deeper structural characteristics of an economy, and the economic literature highlights that growth and development outcomes can depend not only on spending levels but also on the composition and shares of expenditure [12].

By examining GDP through expenditure shares, the analysis shifts attention from how large an economy is to how output is allocated across competing uses. This provides a coherent conceptual basis for evaluating whether systematic differences in GDP structure are associated with cross-country variation in poverty outcomes [9], [13].

In addition to expenditure composition, poverty levels are strongly associated with overall income levels. Countries with higher GDP per capita typically exhibit lower poverty rates. To distinguish the structural role of expenditure shares from differences in income levels, the empirical analysis controls GDP per capita in the regression specification.

2. Channels Linking GDP Components to Poverty

Differences in GDP expenditure composition may be related to poverty because each component reflects a distinct use of economic resources and is linked to different mechanisms affecting living standards, growth, and distribution. The discussion below summarizes the key relations in regard to poverty for each expenditure share.

Consumption Share (C/GDP)

The consumption share of GDP reflects the proportion of total output devoted to current spending rather than savings or investment. Higher consumption shares may be associated with poverty through multiple channels. Consumption expenditure is commonly used as an indicator of household welfare because it reflects the ability of households to purchase goods and services. This is particularly true where "household consumption expenditure is used as a proxy for welfare in most developing countries" [14], [15]. On the other hand, a high consumption share may also signal limited savings and investment capacity, especially in low-income economies where households prioritize immediate needs over capital accumulation. As a result, the relationship between consumption share and poverty may reflect broader structural conditions rather than direct welfare effects and may vary across countries over time.

Investment Share (I/GDP)

The investment share of GDP reflects the extent to which an economy allocates output toward capital formation and the expansion of productive capacity. In theory, higher investment can stimulate productivity improvements and long-run economic growth, which are essential mechanisms for poverty reduction. As noted by Soegoto and Wiganepdo [16] "investment is one of the important factors that can increase economic growth." However, the relationship between investment share and poverty is shaped by investment efficiency, sectoral allocation, and complementarities with institutions and human capital. In economies where investment is concentrated in low-productivity sectors, institutions limit the translation of investment into employment and incomes, leading

higher investment shares to not generate broad-based poverty reductions. Therefore, the investment–poverty relationship may be context-dependent in cross-country comparisons [13].

Government Spending Share (G/GDP)

Government spending as a share of GDP reflects the scale of public sector involvement in the economy and represents an important channel through which governments influence economic and social outcomes [17], [18]. Public expenditure can reduce poverty by financing essential services such as education, healthcare, infrastructure, and social protection programs. However, the poverty-reducing effect of government spending depends not only on the level of expenditure but also on how efficiently and effectively resources are allocated. As emphasized by the World Bank, "the impact of public spending on poverty depends not only on how much is spent, but also on how effectively it is allocated [19]. Consequently, differences in institutional quality, governance, and spending composition imply that higher government spending shares do not necessarily translate into lower poverty rates across all countries, making the relationship potentially weak or context dependent.

Net Exports Share (NX/GDP)

For net exports, share reflects the role of external demand and international trade in shaping an economy's output. Trade and export expansion may reduce poverty through channels such as employment generation, productivity growth, and improved access to global markets. In the real world, trade has helped indirectly and indirectly to reduce poverty by contributing to economic growth and employment. However, the poverty impact of net exports depends on the structure of exports, the domestic value-added content of trade, and how trade gains are distributed across households. Trade benefits are not necessarily broad-based, since "the gains from trade are not automatically shared by all" [20]. Consequently, the relationship between the net exports share and poverty may vary across countries, and over time depending on institutional quality, labor market conditions, and export composition.

Overall, the links between expenditure shares and poverty are not mechanical and may differ across countries depending on institutions, economic structure, and the distribution of gains from growth [17]. For several components, the expected association may therefore be weak or heterogeneous in cross-country data. Nevertheless, taken together, GDP expenditure shares capture meaningful structural features of an economy and provides a useful framework for examining systematic patterns in poverty outcomes.

3. Data

The analysis uses cross-country data from the World Bank's World Development Indicators (WDI) for the period 2000–2024. Poverty is measured using the poverty headcount ratio at $2.15 per day, which reports the percentage of a country's population living below the international extreme poverty line [21].

GDP expenditure composition is measured using standard WDI national accounts indicators expressed as shares of GDP:

- Final consumption expenditure (% of GDP) (Cshare)
- Gross capital formation (% of GDP) (Ishare)
- General government final consumption expenditure (% of GDP) (Gshare)
- Net exports share (% of GDP) (NXshare), constructed as exports (% of GDP) minus imports (% of GDP)

To account for cross-country differences in income levels and stages of development, the empirical specifications also include GDP per capita, expressed in natural logarithmic form log (GDPpc).

The dataset is constructed as a country-level cross-section by averaging annual observations over the period 2000–2024. This approach captures long-run expenditure structures and long-run poverty outcomes, rather than short-run fluctuations. For each country *i*:

- Poverty averaging: Poverty is averaged over all available years between 2000 and 2024.
- Aligned averaging of shares: GDP component shares (Cshare, Ishare, Gshare, NXshare) and GDP per capita are averaged over the same set of years for which poverty observations are available. This ensures temporal alignment between the dependent variable and explanatory variables.
- Minimum data rule: Countries with fewer than three poverty observations are excluded to reduce sensitivity to sparse survey coverage and measurement noise.

Since poverty data are not available every year for all countries, the use of country averages allows the study to retain a broader cross-country sample while reducing the influence of short-term fluctuations. The aligned averaging approach ensures that GDP composition variables are measured over the same years in which poverty data are observed, improving consistency between the dependent and explanatory variables. Countries are included in the regression analysis only when complete data are available for poverty, GDP expenditure shares, and GDP per capita [18], [22] . This procedure yields one observation per country, with the final sample sizes reported in the Results section alongside the relevant summary statistics.

Table 1. Variable Definitions used in analysis

Variable	Definitions
Poverty	Average poverty headcount ratio (% of population below $2.15/day)
Cshare	Final consumption expenditure (% of GDP)
Ishare	Gross Capital formation (% of GDP)
Gshare	General government final consumption expenditure (% of GDP)
NXshare	Net exports share (% of GDP) = exports (% of GDP) − imports (% of GDP)

Source: World Bank (World Development Indicators), author's compilation

B. Accounting Identity and Regression Specification

The components of GDP are linked by the national accounting identity:

$$GDP = C + I + G + (X - M) \quad (2)$$

This accounting relationship implies that GDP expenditure shares are mechanically related, since changes in one component of GDP must be reflected in at least one other component. As a result, the expenditure shares should be understood as indicators of how economic output is allocated across different uses, rather than as fully independent variables.

Although the expenditure shares are linked through the national accounting identity, they do not always sum exactly to 100 percent in practice because of measurement differences, statistical discrepancies, and differences in national accounts reporting across countries. Therefore, the expenditure shares can be included simultaneously in the regression without generating perfect multicollinearity.

However, because the expenditure shares are conceptually and statistically related, the estimated coefficients should be interpreted carefully. The coefficients represent conditional associations between each GDP component share and poverty, holding the other expenditure shares and income level constant. They should not be interpreted as independent causal effects. To reduce concerns related to heteroskedasticity in cross-country data, the regression models are estimated using robust standard errors.

Multicollinearity is also considered because some expenditure shares are highly correlated, particularly the consumption share and net exports share. To assess this issue more formally, variance inflation factors (VIFs) are used as a diagnostic check for the regression variables [23] . The VIF test helps evaluate whether strong linear relationships among the explanatory variables may affect the stability of individual coefficient estimates. Given the accounting relationship among GDP expenditure shares, the VIF results are interpreted as a diagnostic tool rather than as a basis for excluding variables from the model.

In the empirical analysis, the regression models include the shares of consumption, investment, government spending, and net exports, with log GDP per capita included as a control variable in the full specification. The estimated coefficients therefore represent cross-country associations between expenditure composition and poverty, conditional on differences in income levels.

C. Data Analysis

1. Descriptive Analysis

The first step documents basic patterns in the data. Summary statistics are computed for poverty and each GDP expenditure share, including the mean, standard deviation, minimum, and maximum values across countries. To provide additional context, countries are grouped into high-poverty and low-poverty categories based on the median poverty rate. Average expenditure shares are then compared across these groups. This comparison provides a preliminary assessment of whether countries with higher poverty levels exhibit systematically different GDP expenditure structures. The purpose of this stage is purely descriptive. It documents patterns in the data without drawing causal conclusions.

2. Correlation Analysis

The second stage examines the pairwise relationship between poverty and each GDP expenditure share using Pearson correlation coefficients. These correlations measure the direction and strength of the linear association between variables across countries. Because the analysis is based on long-run averages and does not control for other factors, the correlations represent unconditional associations.

This step helps identify which GDP components are positively or negatively related to poverty before introducing multivariate controls. However, these correlations should not be interpreted as evidence of causal relationships. In addition to reporting correlation coefficients, the analysis also evaluates the statistical significance of these relationships using p-values. This allows assessment of whether the observed correlations are statistically distinguishable from zero in the cross-country sample.

3. Cross-country Regression Framework

To assess whether expenditure composition is associated with poverty after accounting for differences in income levels, the analysis estimates the following cross-sectional regression model:

$$Poverty_i = \alpha + \beta_1\ Cshare_i + \beta_2\ Ishare_i + \beta_3\ Gshare_i + \beta_4\ NXshare_i + \beta_5\ log(GDPpc_i) + \varepsilon_i \quad (3)$$

where *i* indexes countries.

All variables are constructed as long-run country averages over the period 2000 to 2024. The model is estimated using ordinary least squares with robust standard errors.

The regression includes the expenditure shares of consumption, investment, government spending, and net exports, along with log GDP per capita as a control variable. The coefficients therefore capture cross-country associations between GDP expenditure composition and poverty while accounting for differences in income levels.

The regression is estimated in two specifications. The first specification includes only GDP expenditure shares to examine their unconditional association with poverty. The second specification adds log GDP per capita to assess whether GDP composition remains associated with poverty after accounting for differences in income levels. Comparing these specifications helps distinguish associations related to expenditure structure from those primarily driven by overall development level.

Log GDP per capita is included to control differences in development levels across countries. Since poverty is strongly associated with income, including GDP per capita allows the regression to assess whether expenditure composition contains information about poverty beyond differences in income levels.

The regression analysis identifies conditional associations rather than causal effects. The results are therefore interpreted as cross-country relationships between long-run expenditure structure and poverty outcomes.

Results

This section presents the empirical findings from the descriptive analysis, correlation analysis, and cross-country regression framework. All results are based on long-run country averages over the period 2000 to 2024.

A. Descriptive Results

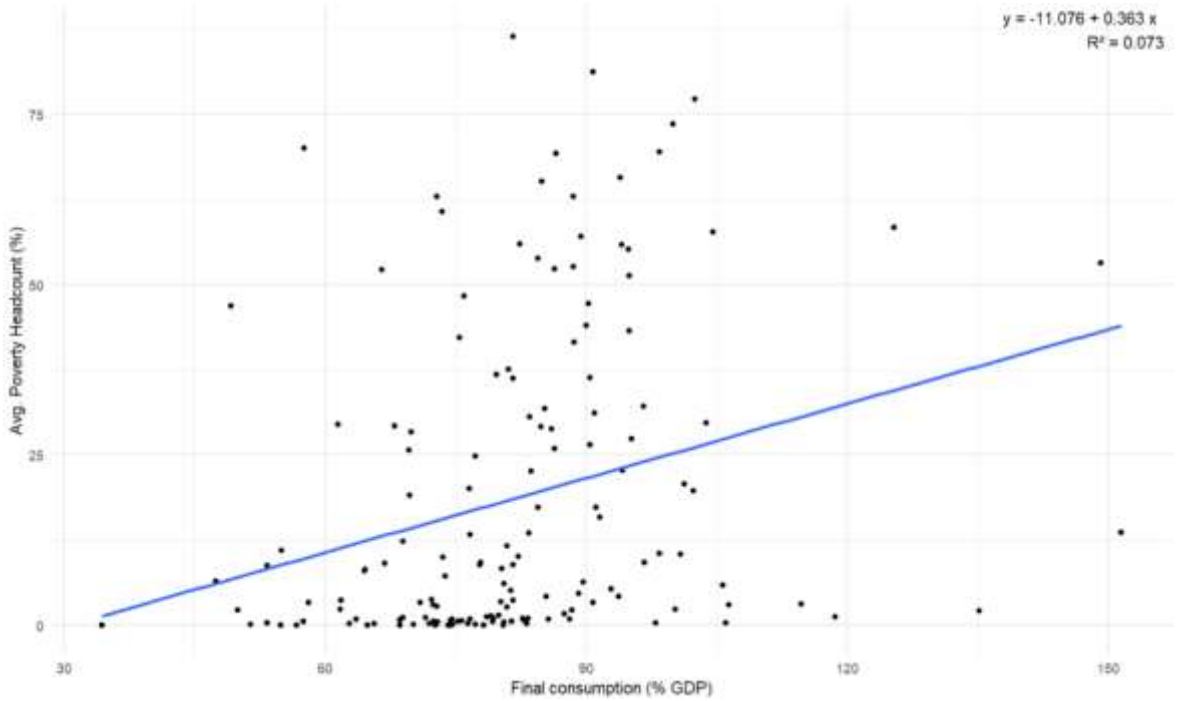
Table 2 reports the mean, standard deviation, minimum, and maximum values for all variables. Poverty rates vary substantially across countries, reflecting wide differences in development levels. Similarly, GDP expenditure shares display meaningful cross-country dispersion.

Table 2. Summary statistics for poverty and GDP expenditure shares across countries

Variable	Mean	Standard Deviation	Minimum	Maximum	N (Number of countries)
Poverty_avg	18.64	21.92	0	86.37	183
C_avg	80.81	18.18	34.34	151.51	185
I_avg	24.45	6.46	5.78	55.73	225
G_avg	17.08	8.16	2.26	78.53	227
NX_avg	-4.65	16.03	-80.53	37.47	235
log_GDPpc	9.45	1.12	6.92	11.77	247

Source: World Bank (World Development Indicators), author's calculations

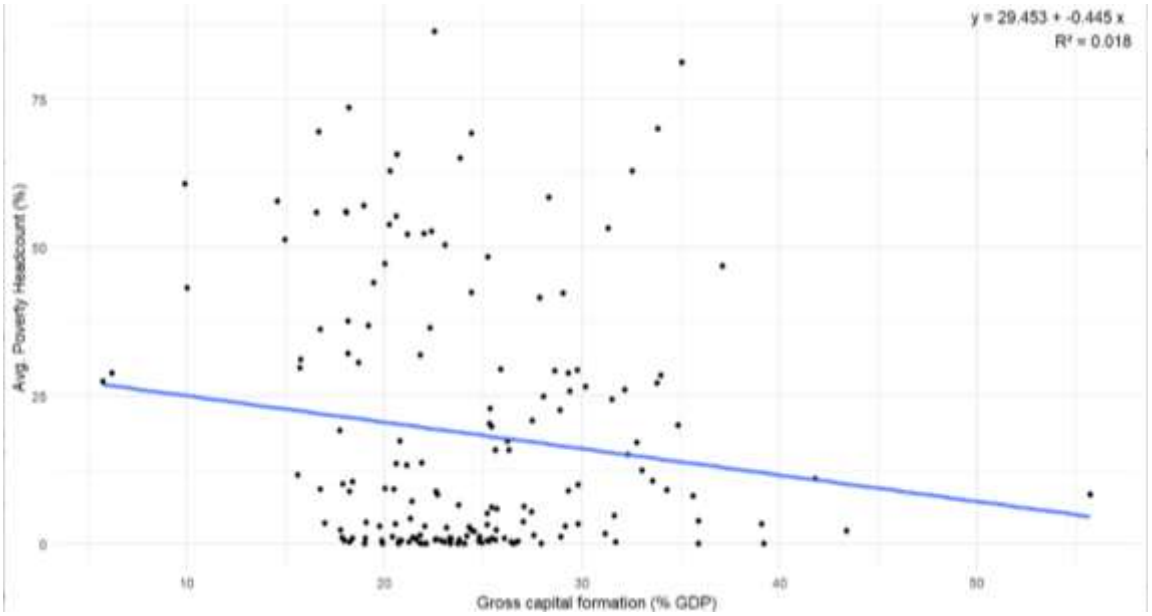
Consumption constitutes the largest average share of GDP across countries, followed by investment and government spending. Net exports exhibit the widest range of values, reflecting both positive and negative trade balances across countries. To further explore these patterns, Figures one through four below present scatterplots of poverty against each expenditure share.



Source: World Bank (World Development Indicators), author's visualization using RStudio

Fig. 1. Poverty vs Final Consumption Expenditure Share

Fig. 1 shows a positive association between the consumption share and poverty. Countries with higher long-run average consumption shares tend to exhibit higher poverty rates. Although the fitted line slopes upward, the dispersion of observations suggests that consumption alone explains only a modest portion of the variation in poverty.

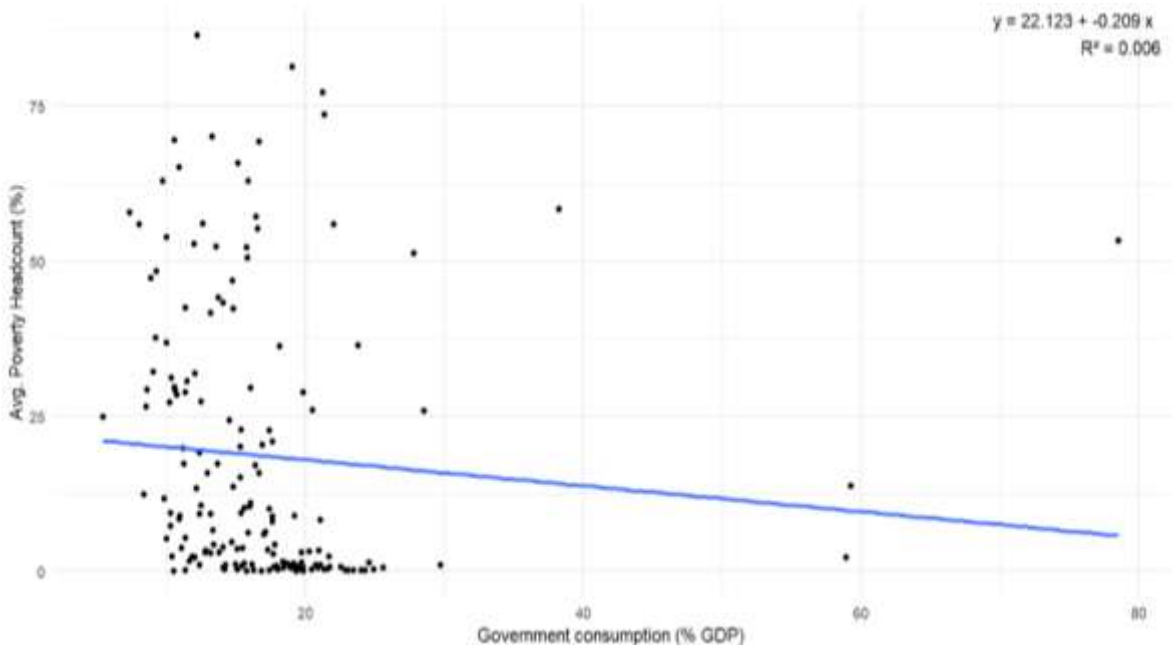


Source: World Bank (World Development Indicators), author's visualization using RStudio

Fig 2. Poverty vs Gross Capital Formation Share

Fig. 2 presents the relationship between the investment share and poverty. The fitted line indicates a weak negative association, suggesting that countries allocating a larger share of

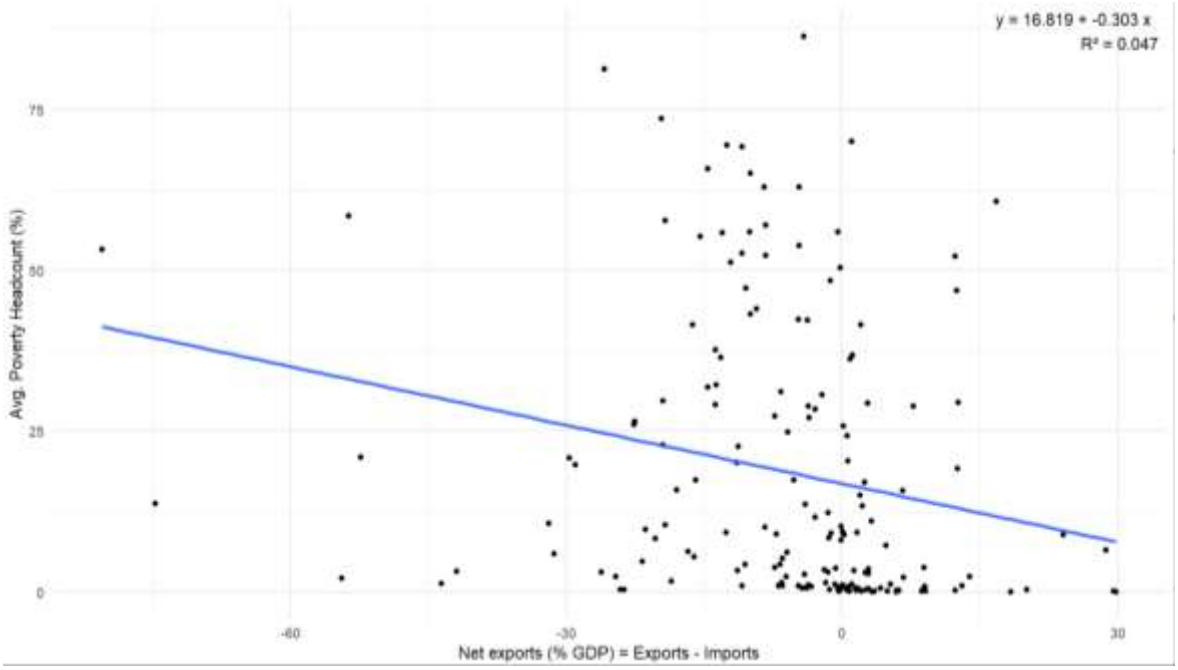
GDP to investment tend to exhibit somewhat lower poverty rates. However, the relationship is not tightly clustered, and substantial variation remains unexplained.



Source: World Bank (World Development Indicators), author's visualization using RStudio

Fig 3. Poverty vs Government Final Consumption Expenditure Share

Fig. 3 presents the relationship between poverty against the government spending share. The relationship appears relatively weak and dispersed. While some countries with higher government spending shares exhibit lower poverty, the overall pattern does not indicate a strong systematic association across the full sample.



Source: World Bank (World Development Indicators), author's visualization using RStudio

Fig 4. Poverty vs Net Exports Share

Fig. 4 shows a negative association between the net exports share and poverty. Countries with higher net export shares tend to exhibit lower poverty rates. Although the relationship is moderate in magnitude, the downward slope suggests that greater external orientation may be associated with lower poverty in long-run cross-country comparisons.

Overall, the descriptive evidence suggests that GDP composition differs across countries with varying poverty levels, with the clearest visual pattern emerging for consumption and net exports shares.

B. Correlation Results

We next examine pairwise linear relationships between poverty and GDP expenditure shares using Pearson correlation coefficients.

Table 3. Pearson Correlation Matrix (Cross-country averages, 2000-2024)

Variable	poverty_avg	C_avg	I_avg	G_avg	NX_avg	log_GDPpc
poverty_avg	1	0.27	-0.134	-0.078	-0.217	-0.813
C_avg	0.27	1	-0.268	0.421	-0.92	-0.556
I_avg	-0.134	-0.268	1	0.018	-0.072	0.02
G_avg	-0.078	0.421	0.018	1	-0.44	0.132
NX_avg	-0.217	-0.92	-0.072	-0.44	1	0.559
log_GDPpc	-0.813	-0.556	0.02	0.132	0.559	1

Source: World Bank (World Development Indicators), author's visualization using RStudio

Table 3 reports unconditional correlations. Poverty is positively correlated with the consumption share and negatively correlated with the net exports share. Investment and government spending shares display weaker and less consistent correlations with poverty.

These correlations provide preliminary evidence of associations between GDP structure and poverty. However, because they do not control income levels, they may partly reflect differences in GDP per capita across countries. The regression analysis below addresses this issue.

Table 4. Statistical Significance of Correlations with Poverty

Variables	p-value	Significance
C_avg	0.0006***	p < 0.01
I_avg	0.0825*	p < 0.10
G_avg	0.3141	not significant
NX_avg	0.0042***	p < 0.01
Log(GDPpc)	0.0001***	p < 0.01

Source: World Bank (World Development Indicators), author's calculations using RStudio
Note: *** p < 0.01, ** p < 0.05, * p < 0.10

Table 4 reports the statistical significance of the pairwise correlations between poverty and each explanatory variable. The results indicate that the consumption share, net exports share, and log GDP per capita are significantly associated with poverty at the 1 percent level. The investment share is weakly significant at the 10 percent level, while the government spending share does not display a statistically significant relationship with poverty.

These results reinforce the patterns observed in the correlation matrix. In particular, the strong significance of log GDP per capita highlights the central role of income in explaining cross-country differences in poverty levels. The significant association between net exports share and poverty also suggests that external economic orientation may be systematically related to poverty outcomes across countries, while the remaining expenditure components show weaker statistical relationships.

C. Regression Results

To assess whether GDP composition is associated with poverty after accounting for income differences, we estimate cross-country ordinary least squares regressions.

Table 5. OLS Regression Results

Variable	Shares Only	+ log GDPpc
Constant	117.430*	150.482***
	(70.562)	(56.239)
C_avg	-0.820	0.636
	(0.740)	(0.573)
I_avg	- 1.216*	0.517
	(0.679)	(0.578)
G_avg	-0.690**	0.579**
	(0.267)	(0.226)
NX_avg	-1.386*	1.234**
	(0.728)	(0.584)
Log(GDPpc)	-	-21.264***
	-	(1.272)
N (Number of Countries)	153	151
R^2	0.148	0.75

Source: World Bank (World Development Indicators), author's calculations using RStudio
Note: Robust standard errors are reported in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10.

Table 6. Model Diagnostic Tests

Diagnostic	Result	Interpretation
Maximum VIF	58.500	High multicollinearity detected
VIF: C_avg	58.474	High multicollinearity
VIF: I_avg	9.192	Moderate to high multicollinearity
VIF: G_avg	1.779	Low multicollinearity
VIF: NX_avg	56.234	High multicollinearity
VIF: log_GDPpc	1.911	Low multicollinearity
Breusch-Pagan test p-value	< 0.001	Heteroskedasticity detected
White test p-value	0.0001	Heteroskedasticity detected
Shapiro-Wilk residual normality p-value	0.741	Residual normality not rejected
Maximum Cook's distance	0.602	Influential observations present
Cook's distance threshold, 4/N	0.0265	Influence threshold
Observations above Cook's threshold	14	Potentially influential observations

Source: World Bank (World Development Indicators), author's calculations using RStudio.

Table 6 reports additional diagnostic tests for the full regression model. The variance inflation factor results indicate substantial multicollinearity, especially for the consumption

share and net exports share [23]. This finding is consistent with the national accounting identity and the strong correlation between these expenditure components. Therefore, the individual coefficients of GDP expenditure shares should be interpreted cautiously, particularly for consumption and net exports. The Breusch-Pagan and White tests indicate the presence of heteroskedasticity in the cross-country regression model [24]. For this reason, robust standard errors are used in the regression estimates. The Shapiro-Wilk test does not reject residual normality, suggesting that the residual distribution does not significantly deviate from normality [25]. Cook's distance identifies 14 potentially influential observations, with the largest Cook's distance observed for Timor-Leste. These diagnostic results suggest that the model should be interpreted as an associative cross-country framework rather than as a causal specification.

Column (1) presents results including expenditure shares without controlling for income. The estimates broadly align with the descriptive and correlation patterns, particularly the negative association between the net exports share and poverty. Column (2) introduces log GDP per capita to control for differences in development levels across countries. As expected, log GDP per capita is strongly negatively associated with poverty, confirming the central role of income in explaining cross-country poverty variation. After controlling income, the coefficient on the net exports share becomes positive. This suggests that the negative unconditional relationship between net exports and poverty largely reflects the correlation between trade orientation and income levels. Once differences in income are accounted for, the remaining association between net exports share and poverty is positive.

In contrast, the investment share becomes weaker and is no longer statistically significant once income is included. The government spending share remains statistically significant, but its interpretation should be treated cautiously because the sign changes after controlling for income, suggesting that the relationship may reflect broader structural differences rather than a direct poverty-reducing effect.

Taken together, the regression results suggest that while income is the dominant determinant of poverty across countries, GDP composition is also associated with poverty outcomes after accounting for differences in income levels. The analysis identifies conditional associations rather than causal effects.

Discussion

Income level remains the strongest factor associated with cross-country differences in poverty. The negative coefficient of log GDP per capita indicates that countries with higher income levels tend to have lower poverty rates. This finding is consistent with the broader literature on economic growth and poverty reduction, which suggests that economic growth generally contributes to poverty reduction, although high levels of income inequality may

weaken this effect and intensify poverty [26]. Higher income levels may reduce poverty through several channels, including greater employment opportunities, stronger fiscal capacity, and improved access to essential services [5]. In this study, the strong statistical significance of log GDP per capita confirms that income differences explain a large share of poverty variation across countries.

Beyond income, the findings suggest that GDP composition provides additional structural information about poverty outcomes. In the descriptive and correlation analysis, the net exports share is negatively associated with poverty, indicating that countries with higher net export shares tend to have lower poverty rates in the unconditional comparison. However, once log GDP per capita is included in the regression, the coefficient on net exports becomes positive. This change in sign suggests that the negative bivariate relationship between net exports and poverty is partly explained by income differences across countries. In other words, countries with stronger net export positions may also tend to have higher income levels, and it is this income effect that explains much of the observed negative relationship with poverty. After controlling for income, the positive association between net exports and poverty should be interpreted cautiously, as it may reflect differences in economic structure, trade balance composition, or other country-specific characteristics rather than a direct poverty-reducing effect [22].

The investment share shows a weaker and less consistent relationship with poverty. Although investment is theoretically important for growth because capital accumulation contributes to higher output and long-run income [27]. the regression results suggest that investment share does not have a strong independent association with poverty after income differences are considered. This may indicate that the poverty-reducing role of investment operates mainly through its contribution to income growth. It may also reflect differences in investment quality, sectoral allocation, and the extent to which investment generates employment and broad-based income gains. Therefore, a higher investment share alone does not necessarily imply lower poverty unless it is translated into productive capacity, job creation, and inclusive growth.

The government spending share also shows a mixed relationship with poverty. While public spending can reduce poverty through education, healthcare, infrastructure, and social protection, its effectiveness depends heavily on how resources are allocated and implemented. This is consistent with the view that the poverty impact of public spending depends more on the composition, targeting, and efficiency of expenditure than on aggregate spending levels alone [28]. In the correlation analysis, government spending is not significantly associated with poverty, suggesting that a larger government share of GDP does not automatically translate

into lower poverty across countries. This may reflect differences in governance quality, fiscal priorities, and the effectiveness of public programs.

Overall, the findings indicate that economic development and income growth remain central to poverty reduction, but GDP composition also provides useful information about the structural characteristics of economies. The results support the idea that development outcomes depend not only on how much an economy produces, but also on how output is allocated across consumption, investment, government spending, and external trade [1], [29]. However, the observed relationships should be interpreted as long-run cross-country associations rather than causal effects.

The diagnostic tests further support this cautious interpretation, as the presence of multicollinearity and heteroskedasticity indicates that individual expenditure-share coefficients should be interpreted carefully, even though robust standard errors and additional robustness checks are used [30].

Importantly, differences in GDP composition may reflect deeper institutional, historical, and structural factors that simultaneously influence both economic structure and poverty outcomes. Therefore, the results should not be read as direct policy prescriptions, such as increasing or decreasing a particular GDP component share in isolation. The diagnostic and robustness checks reinforce this interpretation by showing that the main findings remain broadly consistent, while also confirming the need for cautious interpretation of individual GDP component coefficients. Future research could extend this study using panel data, additional control variables, or identification strategies that allow stronger conclusions about the causal mechanisms linking GDP composition and poverty.

Robustness and Limitations

A. Robustness

Several checks were conducted to assess the stability of the results. First, alternative model specifications were estimated by varying the set of explanatory variables in the regression. This allows verification that the main conclusions are not driven by a particular model specification. The qualitative findings remain similar, particularly regarding the role of income and the association between net exports share and poverty.

Second, the analysis was repeated excluding potential outliers with extremely high poverty rates or unusually large trade imbalances. The main patterns, including the strong role of income and the relative robustness of the net exports share, remain broadly consistent.

Third, the regression was re-estimated after excluding potentially influential observations identified using Cook's distance. Following the common threshold of 4/N, 14 observations were classified as potentially influential and excluded from the robustness regression. The results remain broadly consistent with the main specification.

Table 7. Regression Excluding Influential Observations

Variable	Excluding Influential Observations
Constant	137.361***
	(34.753)
C_avg	0.768*
	(0.364)
I_avg	0.486
	(0.384)
G_avg	0.748***
	(0.197)
NX_avg	1.435***
	(0.380)
Log(GDPpc)	-21.083***
	(1.125)
N (Number of Countries)	137
R^2	0.810

Source: World Bank (World Development Indicators), author's calculations using Rstudio
Note: Robust standard errors are reported in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10.

Log GDP per capita remains negative and highly statistically significant, confirming the dominant role of income in explaining cross-country poverty differences. The net exports share remains positive and statistically significant after controlling for income, while the investment share remains statistically insignificant. These results suggest that the main findings are not driven solely by influential observations.

Fourth, the regression was estimated without log GDP per capita to compare unconditional and conditional results. As expected, income explains a large share of poverty variation, but the negative association between net exports and poverty is observable in both specifications.

Overall, these checks suggest that the core findings, particularly the dominant role of income and the conditional association between net exports share and poverty, are not driven by a single specification choice or a small number of influential observations.

B. Limitations

Despite these robust checks, several limitations should be acknowledged. First, the analysis relies on long-run country averages. While this approach captures structural relationships, it removes time variation and does not allow examination of short-run dynamics or within-country changes. Second, the study is cross-sectional and identifies associations rather than causal effects. Expenditure shares may be influenced by deeper institutional, political, or structural factors that also affect poverty. As a result, reversing causality or omitted variable bias cannot be ruled out. Third, the GDP expenditure identity implies mechanical relationships among the shares. As a result, changes in one component of GDP must be reflected in changes in at least one of the others. This means that the interpretation of coefficients should be understood in terms of relative differences in expenditure composition rather than independent effects of each component. Fourth, poverty is measured using survey-based data

that may vary in frequency and quality across countries. Averaging reduces volatility but may not fully eliminate measurement error. Finally, expenditure shares are broad aggregates. Government spending share does not distinguish between social protection, infrastructure, or administrative spending. Similarly, net exports share does not differentiate between commodity exports and manufacturing exports. These distinctions may matter for poverty outcomes but are not captured in the current framework. Taken together, these limitations suggest that the findings should be interpreted as structural cross-country patterns rather than policy prescriptions.

Conclusion

This study examined whether the expenditure composition of GDP is systematically associated with poverty across countries. Using long-run cross-country averages from 2000 to 2024, the analysis evaluated how the shares of consumption, investment, government spending, and net exports relate to poverty outcomes, while accounting for differences in income levels through log GDP per capita. The results show that income remains the strongest factor associated with cross-country poverty differences. The negative and highly significant relationship between GDP per capita and poverty confirms that countries with higher income levels tend to experience lower poverty rates. This finding reinforces the central role of economic development in poverty reduction, as higher income levels are generally linked to broader employment opportunities, stronger fiscal capacity, and improved access to essential services. Beyond income, the findings suggest that GDP composition provides additional structural information about poverty outcomes. In the descriptive and correlation analysis, the consumption share is positively associated with poverty, while the net exports share is negatively associated with poverty. However, after controlling for income differences, the association between net exports and poverty becomes positive. This change indicates that the negative unconditional relationship between net exports and poverty is largely influenced by differences in income levels across countries. Therefore, GDP composition should be interpreted as reflecting broader structural characteristics of economies rather than as a direct causal determinant of poverty. The investment and government spending shares show weaker and less consistent relationships with poverty. While investment is important for capital accumulation and long-run growth, its poverty-reducing effect may depend on the quality, sectoral allocation, and inclusiveness of investment. Similarly, government spending may reduce poverty when it is effectively targeted toward education, healthcare, infrastructure, and social protection, but aggregate spending levels alone do not necessarily guarantee lower poverty. These results highlight the importance of not only the size of economic activity, but also the way output is allocated and translated into broad-based welfare improvements.

Overall, the study contributes to the discussion on poverty and development by shifting attention from GDP levels alone to the structure of GDP expenditure [1]. The findings indicate that income growth remains central to poverty reduction, but expenditure composition also reflects meaningful differences in economic structure across countries. However, because the analysis is based on long-run cross-country associations, the results should not be interpreted as causal effects or direct policy prescriptions [31]. The diagnostic and robustness checks reinforce this interpretation by showing that the main findings remain broadly consistent, while also confirming the need for cautious interpretation of individual GDP component coefficients. Future research could extend this study by using panel data, additional institutional and distributional control variables, or identification strategies that allow stronger causal interpretation. Such extensions would provide a deeper understanding of how changes in GDP composition interact with income growth, economic structure, and policy effectiveness in shaping poverty outcomes.

Conflict of Interest

The authors declare no conflict of interest.

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