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Re-examining the Poverty-Growth-Inequality Triangle in ASEAN-5 Countries

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ABSTRACT

This study re-examines the Poverty-Growth-Inequality (PGI) triangle within the ASEAN-5 countries comprising Malaysia, Indonesia, the Philippines, Thailand, and Vietnam to determine if economic growth naturally benefits the poor or if structural inequality creates structural barriers to inclusive development. Utilising a balanced panel dataset spanning 1990–2024, the research employs second-generation econometric techniques, including the Pesaran (2004) cross-sectional dependence test, Pesaran (2007) Cross-sectional Augmented IPS (CIPS) unit root tests, Pedroni (1999) panel cointegration, and Dumitrescu and Hurlin (2012) panel Granger non-causality tests. The CIPS test confirms that all variables are integrated of order one, I (1), satisfying the prerequisite for cointegration analysis. The Pedroni cointegration test provides robust evidence of a significant long-run equilibrium relationship among poverty, growth, and inequality across all specifications. Notably, the results reveal strong bidirectional short-run Granger causality between economic growth and poverty, confirming a mutual reinforcement between the two variables. Additionally, a strong bidirectional causality between growth and inequality and a unidirectional link from poverty to inequality are established. These results provide original evidence that Bourguignon's (2003) framework remains relevant but complex in the ASEAN context, implying that growth alone is insufficient for poverty reduction. Consequently, policymakers must move beyond 'trickle-down' assumptions to implement integrated strategies, such as labour market reforms, progressive fiscal policies, and targeted social protection, to dismantle structural barriers and achieve the United Nations Sustainable Development Goals.

Keywords: ASEAN-5, Economic Growth, Income Inequality, Poverty-Growth-Inequality (PGI) Triangle, Sustainable Development Goals (SDGs)

1. INTRODUCTION

Eliminating poverty, reducing inequality, and sustaining inclusive economic growth remain at the heart of the global development agenda, as articulated in the United Nations Sustainable Development Goals (SDGs), specifically SDGs 1, 8, and 10. Extensive theory and empirical research demonstrate that these goals are strongly interlinked rather than being treated as distinct policies (Bourguignon, 2003; Fosu, 2011). Despite this extraordinary global progress, in which extreme poverty fell from 44% in 1981 to less than 8% in 2019, progress toward achieving SDG 1 has begun to slow. Further reductions in poverty are likely to become more difficult in the coming decade, especially without focused policies that address inequality (Negre et al., 2020; Dutta et al., 2023). Recent crises, such as COVID-19, geopolitical tensions, and rising living costs, have caused significant disruption and contributed to new socio-economic inequalities (Miah et al., 2024).

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The pandemic has left a lasting 'scarring effect', resulting in persistent difficulties for developing countries. These impacts include disruption of the labour market that has reduced household incomes (Khamis et al., 2021), alongside significant human capital losses, as millions of children in low- and middle-income countries missed up to a year of schooling, especially due to limited access to digital resources (Schady et al., 2023). These disparities not only deepen existing vulnerabilities and widen socio-economic division but also undermine the ability of economic growth to translate into meaningful poverty reduction.

While these global 'scarring effects' continue to challenge sustainable development, ASEAN has followed a somewhat different path, maintaining strong economic growth despite this pressure. Over the past few decades, the region has undergone a notable transformation, reaching a combined Gross Domestic Product (GDP) of around USD 3.1 trillion in 2021 and becoming the world's fifth-largest economy. Poverty has declined significantly, but progress has not been even across countries or population groups, and meeting the 2030 SDG targets remains a challenge. More importantly, the gains from this growth have not been shared equally.

Persistent challenges among rural communities and ethnic minorities have slowed poverty reduction in several ASEAN countries. This uneven progress is also reflected in regional inequality trends. While Gini coefficients have generally declined in countries such as Malaysia, Myanmar, the Philippines, Thailand, and Vietnam since 2000, inequality has increased in Indonesia and Lao PDR, thereby weakening the poverty-reducing impact of economic growth. These patterns highlight the importance of jointly addressing poverty, economic growth, and inequality to support more inclusive progress toward the SDGs (Park, 2024).

While much has been written on poverty, economic growth, and inequality, these aspects are often studied in isolation, overlooking their dynamic interconnections. This can result in fragmented policies that produce unintended consequences. In the ASEAN-5 countries, for instance, Malaysia, Indonesia, Thailand, the Philippines, and Vietnam, a rapid growth continues alongside entrenched inequality and lingering post-pandemic vulnerabilities. Most research focused on single-country cases or specific linkages, leaving it unclear whether Bourguignon's (2003) PGI framework still applies in today's regional context. Moreover, the long-lasting effects of global shocks, such as the pandemic, have yet to be fully examined through this framework, and they may have altered how poverty responds to economic growth. Without robust evidence on the directional relationships between these variables, policy interventions risk overlooking critical interactions or even producing contradictory outcomes (Sumner et al., 2020; Beker, 2016).

This study addresses these gaps by empirically examining the Poverty–Growth–Inequality triangle in the ASEAN-5 countries. It investigates not only the long-run interactions among poverty, economic growth, and income inequality but also tests the directional relationships proposed by Bourguignon. Understanding these directional links is crucial for both theory and policy, as it reveals whether economic growth naturally benefits the poor or whether persistent inequality creates structural barriers that require direct redistributive measures.

To achieve this, the study employs dynamic panel econometric techniques, including Pedroni (1999) cointegration tests and Granger non-causality analysis, to examine how economic growth and distributional patterns influence poverty outcomes over time (Banna et al., 2020). The findings aim to provide integrated, region-specific insights to guide policies that promote inclusive growth, reduce disparities, and support ASEAN's progress toward sustainable development (Gugler & Vanoli, 2017).

2. LITERATURE REVIEW

The Poverty–Growth–Inequality nexus offers a fundamental framework for understanding how economic growth, income distribution, and poverty reduction interact. Within this framework, multiple studies confirm economic growth is viewed as a key driver of poverty alleviation, but its effectiveness is highly contingent on the initial level and evolving structure of inequality (Cerra et al., 2021; Adeleye et al., 2020; Bergstrom, 2020). The Poverty–Growth–Inequality triangle posits that growth and inequality are jointly determined and simultaneously exert direct effects on poverty, meaning that growth can fail to significantly reduce poverty when its benefits accrue disproportionately to higher-income groups (Amponsah et al., 2023). Consequently, rising or persistent high inequality can dampen or even offset the poverty-reducing impact of growth, particularly in developing and highly unequal societies. This implies that sustainable and inclusive poverty reduction cannot rely solely on economic expansion; rather, it requires a balanced policy approach that combines robust growth with measures to promote a more equitable distribution of income and opportunities (Yusuf et al., 2023).

2.1 Theoretical Foundation and Empirical Evidence of the PGI Nexus

Early development thinking promoted a growth-first 'trickle-down' paradigm, in which rapid capital accumulation and structural transformation were expected to generate jobs and eventually raise living standards for all, especially through industrial expansion in models such as Rostow's stages of growth and Lewis's dual-sector framework (Lewis, 1954; Levitt, 2008). The assumption was that as economies move from traditional agriculture to modern industry, productivity gains and higher profits would, over time, diffuse to lower-income groups through employment and wage growth (Hyder et al., 2015). Kuznets challenged this optimism by proposing an inverted-U relationship between inequality and development, in which inequality rises during early industrialisation and urbanisation but declines as social and political changes foster redistribution and broader access to growth (Lazar & Litan, 2023; Younsi & Bechtini, 2018). This provides a theoretical lens linking structural transformation and income distribution.

Later cross-country and panel evidence show that the growth-inequality nexus is complex and non-linear rather than universal. Several studies document inverted-U or related non-linear relationships between inequality and economic growth or development, but the estimated turning points and the extent of the curves differ across contexts (Banerjee & Duflo, 2000; Chen, 2002; Balcilar et al., 2021). In several cases, high or rising inequality is associated with lower subsequent growth, contradicting simple trickle-down expectations and suggesting that distribution itself shapes growth dynamics. Recent empirical literature strongly establishes that economic growth is far less effective at reducing poverty in high-inequality contexts (Fosu, 2016). In some circumstances, growth in inequality is more effective in reducing poverty than equivalent increases in economic growth (Robeyns, 2025), corroborating earlier findings (Ochi, 2023). High inequality undermines the extent to which the poor can benefit from growth, reducing the elasticity of poverty to growth.

2.2 Mechanisms Linking Inequality and Poverty

Theoretical contributions explain mechanisms through which inequality constrains poverty reduction. Imperfect credit markets, where low-income households cannot invest in human capital due to borrowing constraints, reduce productivity and reinforce inequality (Galor & Zeira, 1993). Similarly, poverty traps emerge from these constraints, disproportionately favouring richer groups and limiting the impact of growth on poverty reduction (Ferreira et al., 2021). Research on nonlinear dynamics and threshold effects further highlights the PGI relationship. Quah (1996) shows that multiple equilibria can emerge, with households below a threshold trapped in persistent poverty while others converge toward higher income levels. Empirical

evidence confirms that inequality and social heterogeneity can create feedback loops that sustain poverty (Arunachalam & Shenoy, 2017; Carter & Barrett, 2006).

2.3 Policy Implications for Inclusive Growth

Sustainable poverty reduction requires a balance between growth-promoting and redistributive policies. Investments in human capital and infrastructure narrow productivity gaps and enable participation in economic opportunities (Satriawan et al., 2025). Progressive fiscal policies and social protection programmes redistribute resources, mitigating the negative effects of inequality (Ashford et al., 2020). Although global literature is extensive, empirical evidence from ASEAN countries is limited and fragmented. Economic growth generally drives poverty reduction, but heterogeneity arises due to differences in inequality, institutional quality, and structural conditions. Countries with lower inequality, such as Malaysia and Thailand, experience stronger poverty reduction effects (Deolalikar, 2024; Islam et al., 2017). Governance quality also mediates the effectiveness of growth in reducing poverty (Perera & Lee, 2013).

3. RESEARCH METHODOLOGY

This paper employs a balanced panel dataset covering five ASEAN countries, including Malaysia, Indonesia, Thailand, the Philippines, and Vietnam, over the period 1990-2024. These countries were selected for their shared regional characteristics, comparable development trajectories, and the availability of consistent long-term data. Annual data for the variables of interest were sourced from the World Bank's World Development Indicators (WDI) to ensure data reliability and cross-country comparability.

To stabilise variance and reduce heteroskedasticity, natural logarithmic transformations are applied to poverty (*lnPOV*) and economic growth (*lnGDP*). The Gini index is retained in its level form due to its bounded nature (ranging from 0 to 100). This bounded range makes logarithmic transformations less suitable and potentially misleading for interpretation, as the variable does not exhibit exponential growth. Table 1 summarises the definitions and sources of the variables.

Table 1 Variables Definition and Sources

Variable	Definition	Source
Poverty (POV)	Poverty headcount ratio at $4.20 a day (2021 PPP) (% of population)	WDI
Economic Growth (GDP)	GDP per capita, PPP (constant 2021 international $)	WDI
Income Inequality (GINI)	Gini Index	WDI

Following Bourguignon's (2003) theoretical framework, the paper examines the long-run relationship among poverty, economic growth, and income inequality in ASEAN countries. Conceptually, the model can be written as:

$$POV_{it} = f\,(GDP_{it}, GINI_{it})$$

Where POV_{it} is poverty in country i at time t, GDP_{it} represents economic growth, and $GINI_{it}$ denotes income inequality. This formulation guides the application of the Pedroni (1999) panel cointegration test and the Dumitrescu and Hurlin (2012) panel Granger non-causality test to examine the following directional hypotheses derived from Bourguignon's (2003) framework: H_1: Economic growth Granger-causes poverty reduction (lnGDP → lnPOV); H_2: Income inequality moderates the growth-poverty link (Gini → lnPOV); and H_3: Poverty levels Granger-cause changes in income inequality (lnPOV → Gini). These hypotheses are tested bidirectionally to capture

potential feedback effects among the three variables. While this parsimonious specification directly tests Bourguignon's framework, we acknowledge the potential for omitted variable bias if other factors influencing poverty are not accounted for. Future research could explore the inclusion of additional controls, such as institutional quality, trade openness, and human capital investment, to further refine these relationships.

To account for potential interdependencies among countries due to economic integration and their exposure to common regional and global shocks, Cross-Sectional Dependence (CD) is first tested using Pesaran's (2004) CD test. Testing cross-sectional dependence is essential, as ignoring inter-country correlations may lead to biased and inconsistent estimates (Pesaran, 2014). The detection of cross-sectional dependence also guides the selection of appropriate second-generation panel econometric techniques that explicitly account for such dependence.

Following the detection of cross-sectional dependence, the variables' stationarity is examined using second-generation panel unit root tests, specifically the Cross-sectional Augmented IPS (CIPS) test proposed by Pesaran (2007). This test explicitly accommodates cross-sectional dependence while allowing for heterogeneity across countries. It assesses whether the variables are non-stationary in levels but become stationary after first differencing, thereby ensuring that none of the series are integrated of order two. Establishing the order of integration is a prerequisite for valid cointegration analysis, as cointegration requires variables to be integrated of the same order, typically *I* (1) (Baltagi & Pesaran, 2007).

The existence of a long-run equilibrium relationship among the variables is assessed using the Pedroni (1999) panel cointegration test. This test allows heterogeneous cointegrating vectors across panel members, making it suitable for the ASEAN-5 panel, where member countries differ in institutional structures, development levels, and distributional patterns. Specifically, the analysis employs three test statistics—the Modified Phillips-Perron *t*, the Phillips-Perron *t*, and the Augmented Dickey-Fuller *t*—estimated both with and without a deterministic trend to ensure robustness. The optimal lag length is determined using the Newey-West automatic bandwidth selection with a Bartlett kernel. Rejection of the null hypothesis of no cointegration by the majority of these statistics provides evidence of a long-run equilibrium relationship among poverty, economic growth, and income inequality.

To explore the direction of the relationships between the variables and test Bourguignon's directional hypotheses, the Dumitrescu and Hurlin (2012) panel Granger non-causality test is employed. This approach accommodates heterogeneity in causal relationships across countries and permits different causal dynamics within the panel. The test is performed using an optimal lag determined by the BIC. The causality analysis focuses on identifying the directional linkages among poverty, economic growth, and income inequality, thereby providing empirical evidence on whether the directional hypotheses proposed by Bourguignon are supported in the ASEAN context (Dumitrescu & Hurlin, 2012).

4. RESULTS AND DISCUSSION

Consistent with the econometric approaches outlined in the methodology, the analysis begins with descriptive statistics, followed by a test for cross-sectional dependence and unit root properties. The existence of a long-run relationship is then examined using panel cointegration techniques, and finally, the direction of the relationships is assessed through panel Granger non-causality tests.

Table 2 presents the descriptive statistics for poverty (*lnPOV*), economic growth (*lnGDP*), and income inequality (Gini) based on 175 balanced panel observations for the ASEAN-5 countries. The mean value of *lnPOV* is 2.596, with a relatively large standard deviation of 1.785, indicating substantial variation in poverty levels across countries and over time. The wide range, from –

2.303 to 4.530, further reflects considerable heterogeneity in poverty incidence within the sample. In contrast, *lnGDP* exhibits a mean of 9.223 and a smaller standard deviation of .641, suggesting comparatively lower dispersion in income level, although the minimum (7.811) and maximum (11.490) values indicate differences in economic development among the countries. GDP per capita appears more stable relative to poverty. The Gini coefficient averages 39.833, with a standard deviation of 5.238 and a range of 29.3 to 49.1, indicating moderate but meaningful variation in income inequality across the panel. Overall, the observed dispersion in all variables provides sufficient variability to support panel estimation and long-run interaction analysis within the PGI framework in ASEAN-5.

Table 2 Descriptive Summary

Variable	Obs	Mean	Std dev.	Min	Max
lnPOV	175	2.596341	1.785193	-2.302585	4.530447
lnGDP	175	9.222699	0.6406632	7.811163	11.48975
Gini	175	39.83314	5.237853	29.3	49.1

Table 3 reports the results of Pesaran's (2004) CD test for the variables included in the model. The findings indicate strong cross-sectional dependence for *lnPOV* and *lnGDP*. Specifically, the CD statistics for *lnPOV* (18.00) and *lnGDP* (15.87) are highly significant at the 1% level (p = .000), suggesting that shocks affecting one country are likely to spill over to others in the ASEAN-5 panel. The high average pairwise correlations further confirm substantial interdependence across countries. In contrast, the Gini coefficient does not exhibit cross-sectional dependence. The CD statistic (-.05) is statistically insignificant (p = .959), suggesting that inequality dynamics are largely country-specific rather than driven by common regional shocks. Overall, the presence of a cross-sectional dependence in poverty and growth justifies the use of second-generation panel econometric techniques that account for cross-sectional correlation.

Table 3 Pesaran (2004) Cross-Sectional Dependence Test

Variable	CD-test	p-value	corr	abs (corr)
lnPOV	18.00	.000	.962	.962
lnGDP	15.87	.000	.848	.848
Gini	-.05	.959	-.003	.437

Table 4 presents the CIPS panel unit root test results (Pesaran, 2007). At level, all three variables, which are *lnPOV* (−1.917), *lnGDP* (−2.712), and *Gini* (−2.338), fail to reject the null hypothesis of a unit root, as their CIPS statistics do not exceed the critical value of −2.73 at the 10% level. Upon first differencing, all variables become stationary, with CIPS statistics of −4.659, −5.076, and −5.264, respectively, all significant at the 1% level. This confirms that *lnPOV, lnGDP*, and *Gini* are integrated of order one, *I*(1), satisfying the prerequisite for cointegration analysis.

Table 4 CIPS Panel Unit Root Test

Variable	Level	First Difference	Critical Value (1%)	Order
lnPOV	−1.917	−4.659***	−3.06	I(1)
lnGDP	−2.712	−5.076***	−3.06	I(1)
Gini	−2.338	−5.264***	−3.06	I(1)

*Note: All tests include the constant and trend terms. Lag selection based on the General-to-Particular procedure using the F joint test with maxlags(2). *** denotes rejection of H0 (unit root) at 1% significance level. CIPS* for D.lnGDP indicates that individual statistics are truncated during aggregation. Critical values: 10% = −2.73, 5% = −2.84, 1% = −3.06.*

The existence of a long-run relationship among poverty, economic growth, and income inequality is examined using the Pedroni (1999) panel cointegration test. Table 5 presents the results for both specifications, without and with a deterministic trend. Without trend, all three statistics

reject the null hypothesis of no cointegration: the Modified Phillips-Perron *t* (2.1087, p = .018), Phillips-Perron *t* (2.0894, p = .018), and Augmented Dickey-Fuller *t* (2.1377, p = .016) are all significant at the 5% level. With trend included, the evidence strengthens considerably, with the Modified Phillips-Perron *t* (3.0002, p = .001), Phillips-Perron *t* (3.3692, p = .000), and Augmented Dickey-Fuller *t* (3.9863, p = .000) all significant at the 1% level. The consistent rejection of the null hypothesis across all statistics and both specifications provides robust evidence of a long-run equilibrium relationship among poverty, economic growth, and income inequality within the PGI framework.

Table 5 Panel Cointegration Test

Statistic	Value (no trend)	p-value	Value (with trend)	p-value
Modified Phillips-Perron *t*	2.1087	.0175**	3.0002	.0013***
Phillips-Perron *t*	2.0894	.0183**	3.3692	.0004***
Augmented Dickey-Fuller *t*	2.1377	.0163**	3.9863	.0000***

To examine the direction of the relationships among the variables, the Dumitrescu and Hurlin (2012) panel Granger non-causality test is applied, and the results are summarised in Table 6. The empirical findings reveal strong bidirectional Granger causality between economic growth and poverty. Both the null hypothesis that *lnGDP* does not Granger-cause *lnPOV* (Z-bar tilde = 3.257, p = .001) and the null hypothesis that *lnPOV* does not Granger-cause *lnGDP* (Z-bar tilde = 2.603, p = .009) are rejected at the 1% and 5% levels, respectively. This indicates that economic growth and poverty are mutually reinforcing in the short run, consistent with a feedback loop in which economic expansion reduces poverty while poverty itself constrains future economic performance.

At the 10% significant level, the result finds evidence of unidirectional causality running from poverty to income inequality. In contrast, the causal relationship between income inequality and poverty is not statistically significant. This establishes that changes in poverty precede shifts in the broader income distribution within the sampled panels. Lastly, the results show strong bidirectional causality between economic growth and income inequality. This suggests that economic growth influences the distribution of income, while the degree of inequality simultaneously serves as a significant predictor for future economic performance.

Overall, these findings largely support Bourguignon's PGI framework, confirming that the poverty-growth linkage operates through direct, mutually reinforcing channels and highlighting the complex, bidirectional interplay between growth and inequality in the ASEAN context.

Table 6 Panel Granger Non-Causality Test

Null Hypothesis	Z-bar tilde	p-value	Conclusion
lnGDP ⇏ lnPOV	3.2569	.0011***	Causality present
lnPOV ⇏ lnGDP	2.6025	.0093**	Causality present
Gini ⇏lnPOV	.7440	.4569	No causality
lnPOV ⇏ Gini	2.2492	.0245**	Causality present
Gini ⇏lnGDP	5.8315	.0000***	Causality present
lnGDP ⇏ Gini	11.3556	.0000***	Causality present

5. DISCUSSION

These empirical findings provide a deeper understanding of the complex structural and dynamic relationships that characterise the Poverty–Growth–Inequality nexus in the ASEAN-5. The descriptive evidence reveals substantial heterogeneity in poverty (relative to the more stable distribution of economic growth), suggesting that similar growth paths within and across

countries do not yield uniform poverty outcomes. This asymmetry indicates that country-specific structural conditions like labour market segmentation, institutional effectiveness, and access to provided opportunities mediate the transformation of economic growth into improvements in welfare (Agénor, 2004; Borrmann et al., 2006; Chang et al., 2008).

The confirmation of a long-run cointegrating relationship among poverty, growth, and inequality in ASEAN-5 supports the structural interdependence posited in the PGI framework. While short-run deviations may result from shocks or policy changes, the system tends to converge to the long-run equilibrium. The strongest evidence comes from Nindien et al. (2025), whose VECM analysis of Indonesia identified four cointegrating vectors among poverty, growth indicators, and inequality, with a significant error correction term reflecting gradual adjustment toward long-term equilibrium. This directly supports the convergence mechanism described in the research question. More broadly, Zaman et al. (2019) examined the Growth-Inequality-Poverty triangle across 124 countries (2010–2013), finding that income inequality increases poverty headcounts, whereas higher average household income reduces poverty, confirming the structural interdependence. However, this study did not specifically test ASEAN-5 or employ cointegration methods.

Additional evidence from ASEAN studies reveals mixed support for the Poverty–Growth–Inequality cointegration framework, with methodological variations yielding different insights into long-run relationships. Ayyash et al. (2025) employed the CS-ARDL methodology across ASEAN-5 (1991–2023) and found evidence of both short- and long-run relationships between growth and inequality, confirming the Kuznets curve hypothesis. Their approach accounts for slope heterogeneity and cross-sectional dependency, suggesting that while cointegrating relationships exist, they may vary across countries rather than following a uniform pattern. Soh et al. (2025) used Panel ARDL analysis across selected ASEAN countries and found that financial development can reduce income inequality, but this does not imply a reduction in poverty. This suggests that while some variables in the PGI framework exhibit long-run relationships, the connections may be incomplete or conditional. These findings suggest that while long-run relationships exist among PGI variables in ASEAN, the nature of cointegration may be more complex and heterogeneous than a simple equilibrium framework implies.

The confirmation of bidirectional short-run Granger causality between economic growth and poverty represents a key finding that both supports and extends Bourguignon's (2003) framework. The direction from growth to poverty (H_1) confirms that economic expansion does reduce poverty even in the short run, though the mechanism appears indirect and subject to structural mediators such as labour market absorption capacity and distributional channels. The reverse direction, from poverty to growth, suggests that high poverty levels constrain future economic performance, potentially through reduced human capital investment, lower domestic demand, and weakened institutional capacity. This feedback loop is consistent with poverty trap theory (Galor & Zeira, 1993) and underscores the importance of breaking the cycle through targeted intervention. Naufal and Fikriah (2023) similarly found bidirectional causality between economic growth and poverty in Aceh Province, which now aligns with rather than contradicts the present findings. Weak unidirectional causality from poverty to inequality (H_3) indicates that improvements at the lower end of the income spectrum gradually reshape distributional outcomes, though this channel does not operate in reverse in the short run. This is consistent with the notion that distributional change lags behind structural shifts in poverty incidence. The strong bidirectional causality between growth and inequality underscores a feedback mechanism in which existing inequality both conditions and is shaped by future growth. This is the most theoretically significant finding and connects directly to the Kuznets curve debate and skill-biased technological change literature. As ASEAN economies grow, structural transformation may initially widen inequality before redistributive forces take hold. No prior study directly tests the unidirectional poverty-to-inequality causality specifically for ASEAN-5, making this a novel

contribution. The evidence collectively suggests that the causal directions are consistent with theoretical predictions, though the magnitudes and channels vary across country contexts.

Malaysia's strong institutional capacity and targeted social programmes have been instrumental in reducing poverty, with rates declining from 49.3% in 1970 to 1.7% in 2012, representing an approximate 97% reduction, driven by sustained initiatives such as eKasih, 1AZAM, and FELDA within a stable policy environment (Manaf & Ibrahim, 2017). This achievement is often regarded as exceptional among countries at comparable levels of development (Asadullah et al., 2021). However, these gains have not translated into uniform distributional outcomes, as regional disparities continue to shape inequality. Evidence shows that poverty and income dynamics differ markedly across geographic areas, with persistent gaps between the more developed urban regions of Peninsular Malaysia and the less developed rural areas of East Malaysia (Rongen et al., 2023). Although regional inequality initially declined, it has re-emerged alongside further economic development, reflecting enduring structural imbalances across regions (Abdullah et al., 2015; Asadullah et al., 2023).

Indonesia exhibits substantial poverty reduction alongside economic expansion, yet labour informality, geographic fragmentation, and uneven access to education and services continue to limit the inclusiveness of growth, a pattern strongly supported by empirical evidence. Poverty incidence in Indonesia has halved over two decades, though nearly 30 million remain below the poverty line, yet the inclusiveness of growth is constrained by declining employment elasticity due to a shift toward capital intensive sectors, persistent regional disparities in economic performance and poverty reduction and unequal access to education and health services, with benefits concentrated among higher income groups rather than broadly distributed (Vujanovic, 2015; Dartanto, 2014).

Thailand and the Philippines present mixed outcomes, whereby structural rigidities in labour markets, demographic pressures, and governance constraints dampen the poverty-reducing impact of growth despite periods of robust expansion. Kurita and Kurosaki (2011) found that inequality reduced the growth rate of per capita consumption in both countries, with differences in inequality accounting for a substantial portion of the disparity in growth and poverty reduction between the two. Similarly, Balakrishnan et al. (2013) documented that rising inequality has dampened the effectiveness of growth in reducing poverty. Labour market rigidities further constrain inclusiveness, as Lachler and Arulpragasam (2011) identified labour market segmentation and other structural factors that inhibit the fluid movement of workers in the Philippines, while Albert et al. (2015) confirmed that strong economic growth has not translated into significant poverty reduction due to persistent distributional constraints.

Vietnam stands out for its success in reducing poverty through structural transformation, export-oriented industrialisation and human capital development, though emerging rural–urban and regional disparities underscore persistent distributional challenges (World Bank, 2018; Kozel, 2014; Thanh & Van Dien, 2023). These underscore the need for ASEAN-5 countries to pursue context-specific strategies that combine inclusive growth, social protection, labour market reform, and institutional strengthening to ensure that economic expansion delivers sustainable poverty reduction and mitigates inequality.

6. CONCLUSION

The analysis of the PGI nexus in the ASEAN-5 shows that these dimensions are deeply interconnected, yet they play out differently across countries. Long-run evidence confirms that poverty, growth, and inequality are fundamentally linked, meaning that policy changes in one area inevitably affect the others. However, even countries with similar growth patterns, such as Indonesia, Malaysia, and Vietnam, have experienced very different outcomes in poverty and inequality. This highlights that growth alone does not guarantee social progress and that country-

specific structural factors shape how economic expansion translates into real improvements in people's lives. In the short run, this relationship is not automatic. Economic growth does not immediately translate into poverty reduction because structural barriers like entrenched inequality, segmented labour markets, and regional fragmentation slow the process. Even relatively successful countries such as Malaysia and Vietnam now face renewed challenges from rural-urban and regional disparities, which risk creating long-term patterns of uneven development.

Taken together, these findings have direct implications for policy design that are grounded in the theoretical framework. Bourguignon's (2003) Poverty–Growth–Inequality triangle predicts that growth reduces poverty only when inequality is simultaneously addressed, a prediction the empirical results confirm through bidirectional causality between growth and poverty and the strong feedback loop between growth and inequality. This means that policies targeting growth in isolation will be insufficient. Consistent with the credit-market-constraint mechanism identified by Galor and Zeira (1993), the persistence of poverty in ASEAN-5 reflects structural barriers that prevent lower-income households from fully participating in economic expansion. Sustained progress, therefore, requires policies that dismantle these barriers by addressing structural inequality, strengthening institutions and social protection systems, and expanding opportunities for productive engagement. In practice, this means translating the theoretical mechanisms into country-specific action. The bidirectional growth-inequality causality, consistent with Kuznets curve dynamics, suggests that ASEAN economies at earlier stages of structural transformation should proactively implement redistributive measures rather than wait for inequality to self-correct. Concretely, this means focusing on labour market reforms and skills development in Indonesia and the Philippines to improve employment elasticity, promoting inclusive industrialisation and rural development in Vietnam to narrow spatial disparities, maintaining and expanding targeted social programmes in Malaysia to prevent the re-emergence of relative poverty, and implementing governance and fiscal reforms in Thailand to improve the distributional impact of growth.

Ultimately, increasing the impact of growth on poverty reduction requires a coherent and theoretically informed combination of measures. The unidirectional causality from poverty to inequality, supporting H_3 of Bourguignon's (2003) framework, implies that poverty reduction itself is a redistributive instrument, as poverty declines, inequality gradually follows. This reinforces the importance of direct poverty-targeting policies such as formalising employment, supporting small and medium-sized enterprises, and providing conditional cash transfers and social protection floors. Progressive fiscal policies are critical to ease the inequality brake identified in the bidirectional growth-inequality results, while investments in decentralised infrastructure and equitable human capital development address the spatial and credit market constraints theorised by Galor and Zeira (1993). By aligning policy design with the empirically confirmed directional mechanisms of the PGI nexus, ASEAN-5 countries can ensure that economic growth delivers broad-based welfare improvements, prevents the deepening of entrenched inequality, and supports a truly inclusive and sustainable development path aligned with the SDGs.

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