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SDG Convergence or Divergence? Indonesia's Development Trajectory Among Emerging Economies and the Path Toward OECD Standards (2000–2025)

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ABSTRACT

Despite Indonesia's stated commitment to the 2030 Agenda, the quantitative distance between its SDG performance and OECD benchmarks has received surprisingly little systematic attention. This paper closes that gap by extending a comparative convergence analysis of Indonesia against 14 emerging-economy peers, using panel data for 167 countries from 2000 to 2025, two years further than any prior published study. Four methods are applied sequentially: sigma-convergence analysis using the coefficient of variation, beta-convergence estimation via ordinary least squares regression, K-means cluster analysis across 17 SDG dimensions, and an OECD Gap–Momentum Priority Matrix constructed from Lasso regression and Spearman rank correlation. The results confirm sigma-convergence among the peer group (CV falling from 9.58% in 2000 to 6.97% in 2025). However, Indonesia's own beta-convergence coefficient remains statistically tenuous ($\beta = 0.064$, $p = 0.071$), pointing to structural inertia rather than purposeful catch-up. The Kruskal-Wallis test confirms that regional score differences are not random variation ($H = 127.34$, $p < 0.001$). Indonesia's largest absolute deficits lie in SDG 9 (Industry, Innovation, and Infrastructure; gap = 34.5 points), SDG 3 (Good Health; 25.8 points), and SDG 15 (Life on Land; 21.9 points). However, with an annual progress rate of 0.851 points (the fastest recorded among all 15 peers), Indonesia is on track to close the OECD gap within roughly 11 years at the current pace. SDGs 9, 3, and 5 are identified as the highest-return targets for concentrated policy effort given their combination of structural weight and persistent underperformance.

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■ INTRODUCTION

The Sustainable Development Goals are the most extensive multilateral development commitment in modern history. Since 193 UN member states adopted them in 2015, governments have been expected to align national planning around 17 goals and 169 targets, all with a 2030 deadline. A decade in, the picture is discouraging. The Sustainable Development Report 2025 finds that none of the 17 goals is on track globally, with structural vulnerabilities, limited fiscal space, and geopolitical fragmentation compounding the problem (Sachs et al., 2025). For three years after 2020, average global progress on the SDGs stalled altogether, and the gap between high-income and low-income countries may well be wider in 2030 than it was at the outset (Sachs et al., 2023).

Indonesia occupies a peculiar position in this story. With more than 280 million people, an active G20 seat, and GDP projections that place it among the five largest economies by 2045, what Indonesia does with the SDGs matters well beyond its own borders. Its SDG Index score of 70.70 in 2025 sits comfortably above the global median but still trails the OECD average by 9.7 points: a gap that reflects structural capacity rather than ambition. Knowing which goals widen that gap, and whether Indonesia is closing it faster or slower than comparable countries, has concrete implications for how the RPJMN 2025–2029 and the long-term RPJPN 2025–2045 should allocate scarce policy attention.

The academic literature on SDG

convergence has grown, but it remains narrower than the decades of scholarship on income convergence. Sigma- and beta-convergence methods, drawn from the Solow (1956) model and made operational by Barro and Sala-i-Martin (1992), have only recently been applied to SDG data. A 2024 study in World Development, covering 190 countries, confirms conditional beta-convergence in SDG indices but finds the rate highly sensitive to initial conditions and institutional quality (ScienceDirect, 2024). A Nature Communications paper using economic complexity methods across 166 countries shows that countries with similar overall SDG scores can have entirely different structural profiles beneath the surface (Nature Communications, 2025). Mahmood et al. (2024), working with a club convergence framework across 149 countries from 2000 to 2023, find no unconditional global convergence, but do identify five distinct country clubs within which convergence holds, which means peer group selection profoundly shapes what conclusions one draws.

Indonesia appears in all of these studies, but never as the primary focus. None has benchmarked Indonesia's SDG trajectory against a carefully chosen group of emerging-economy peers across a full 25-year panel, identified which goals generate the largest structural distance from the OECD frontier, or quantified convergence speed using data extending beyond 2023. This paper does all three. The dataset runs to 2025, drawing on the newly released Sustainable Development Report 2025 (Sachs et al., 2025) and the BPS-Statistics Indonesia SDG Indicators 2025 (BPS, 2025), making this, to the authors' knowledge, the most current quantitative benchmarking of Indonesia's SDG convergence available.

Three research gaps drive the empirical design. First, prior convergence analyses stop at 2022 or 2023, missing the post-pandemic trajectory correction. Second, Indonesia is always embedded in global analyses rather than treated as the unit of interest. Third, no study has developed a policy-actionable priority matrix that simultaneously ranks SDG goals by both structural weight and convergence momentum. This paper addresses all three. Three testable hypotheses structure the analysis. Hypothesis 1 holds that sigma-convergence is occurring among the 15 emerging economies between 2000 and 2025, meaning intra-group score dispersion is declining over time. Hypothesis 2 posits that Indonesia's own beta-convergence coefficient is negative and statistically significant, consistent with a catch-up dynamic. Hypothesis 3 argues that the goals driving Indonesia's largest gaps are structurally separate from those where progress is fastest — a misalignment that would identify specific bottlenecks rather than generic underperformance.

Two research questions frame the empirical inquiry. RQ1: Does Indonesia's SDG convergence trajectory, assessed through both sigma- and beta-convergence metrics, align with a sustained catch-up dynamic in comparison to its emerging economy peers and the OECD benchmark from 2000 to 2025? RQ2: Which specific SDG goals exhibit the greatest structural distance from the OECD frontier while simultaneously demonstrating the weakest momentum, and what does this misalignment imply for Indonesia's national planning priorities in the current RPJMN cycle?

The paper proceeds as follows. Section 2 reviews the convergence literature and Indonesia's development context. Section 3 describes the data and four-stage methodology. Section 4 presents the empirical results. Section 5 discusses findings and policy implications. Section 6 concludes

■ METHOD

Data Sources and Sample

The primary dataset was the Sustainable Development Report 2025 (Sachs et al., 2025), which covers 167 countries and reports composite SDG Index scores across all 17 goals using 126 indicators. The longitudinal panel, retroactively recalculated with the 2025 methodology to preserve time-series comparability, provides annual observations from 2000 to 2025. Scores range from 0 to 100, with 100 representing full achievement. The BPS-Statistics Indonesia SDG Indicators 2025 (BPS, 2025) served as a secondary check for Indonesia-specific goal-level scores. The peer group comprised 15 economies: Indonesia, India, China, Brazil, Vietnam, Thailand, Malaysia, the Philippines, Colombia, South Africa, Nigeria, Bangladesh, Mexico, Turkey, and Peru. Because the SDR 2025 revises its indicator basket annually, cross-year comparisons throughout this study rely on the retroactively harmonized series from the SDG Transformation Center data hub (Sachs et al., 2025) rather than raw scores from successive annual editions, which are not directly comparable.

Analytical Framework

The methodology was carried out in four stages, with each stage addressing a more focused question regarding Indonesia's SDG status. Stage 1 tests whether cross-country

score dispersion is declining over time among the 15 peer economies (sigma-convergence). Following Sharma & Sharma (2024), the coefficient of variation is computed annually:

$$\sigma_t = SD_t / \mu_t \quad (1)$$

where σ_t is the coefficient of variation in year t, SD_t is the standard deviation of SDG Index scores across the peer group, and μ_t is the group mean. A sustained decline in σ_t confirms sigma-convergence. Stage 2 tests whether countries further from the SDG frontier improved faster over 2000–2025 (beta-convergence), using ordinary least squares:

$$\Delta SDG_i = \alpha + \beta \cdot SDG_{i,t-1} + \varepsilon_i \quad (2)$$

where ΔSDG_i is the annual change in the SDG Index for country i, $SDG_{i,t-1}$ is the prior-year score, and β is the convergence coefficient. A negative, significant β confirms catch-up convergence. This model is estimated for both the pooled panel of 15 peers and Indonesia's individual time series.

Stage 3 applied K-means cluster analysis to 33 countries (15 emerging economies plus 18 OECD members), clustering on all 17 standardized SDG goal scores. The 18 OECD members were selected to represent the full geographic and income spectrum within the OECD, while excluding countries with missing goal-level data for the 2015–2025 period. Specifically, these are Australia, Austria, Canada, Denmark, Finland, France, Germany, Japan, South Korea, the Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, the United Kingdom, and the United States, plus the OECD composite mean as a reference node. This selection ensured that the cluster solution captures the OECD performance frontier without being distorted by data gaps that affect several smaller or newer OECD members. The elbow method selected k = 4 clusters, consistent with the four-group structure found by Mahmood et al. (2024). The cluster solution identifies Indonesia's structural peer group and its distance from OECD-level distributions. Stage 4 constructed the OECD Gap–Momentum Priority Matrix. Each of Indonesia's 17 goals is plotted along two axes: the absolute gap between Indonesia's 2025 score and the OECD mean, and the post-2015 annual progress rate derived from an OLS slope on the 2015–2025 time series. Five-fold cross-validated Lasso regression identified which goals most predict the overall SDG Index score across 167 countries, providing empirical weights for strategic prioritization. Spearman rank correlations between each goal score and the overall index validate the leverage ranking.

Diagnostic Tests

Before running convergence models, the Kruskal-Wallis H-test was used to assess whether SDG Index scores differed significantly across the seven world regions in the 2025 dataset. This non-parametric test is appropriate because SDG scores are bounded, show non-normal distributions across regions, and exhibit heteroscedasticity (Sharma & Sharma, 2024). Catch-up velocity (the number of years each country would need to reach the OECD mean at its current rate) was then computed as:

$$Years\_to\_OECD_i = (OECD\_frontier - Score_{i,2025}) / \bar{\beta}\_slope_i \quad (3)$$

where β_slope_i is the country's OLS-estimated annual progress rate over 2015–2025, and OECD_frontier is the OECD mean SDG Index score in 2025 (80.40). To avoid notational ambiguity with the convergence coefficient β in Equation 2, the annual progress rate (β_slope) is denoted γ_i throughout Table 2 and any subsequent references to country-level annual trajectories. The two parameters were conceptually distinct: β in Equation 2 tested whether lower-scoring countries improve faster as a group, while γ_i simply measured the realized annual rate of change for country i over the 2015–2025 interval.

■ RESULTS AND DISCUSSION

Table 1 covers the full 375 country-year observations in the panel. The peer group averages 67.42 SDG Index points, with a coefficient of variation of 13.27%, which is sufficiently wide to justify both the convergence analysis and the cluster decomposition. All scores on a 0–100 scale. CV = coefficient of variation. N = 375 observations (15 peers × 25 years). SDG 9 is the most variable goal across the panel (CV = 34.86%), consistent with its role as the primary dividing line between emerging and OECD economies in structural capacity. SDG 13 shows a variance in the opposite direction: lower-income countries frequently outscore OECD peers on climate metrics because lower per-capita consumption reduces measured carbon intensity, not because their environmental policies are stronger.

Table 2 presents 2025 scores for all 15 peers. Indonesia's 70.70 places it sixth overall, ahead of India (63.89), South Africa (64.32), Bangladesh (66.48), and Nigeria (54.61), but behind Thailand (75.11), China (74.20), Brazil

Table 1. Descriptive statistics: sdg index and selected goal scores (n = 375 country-year observations, 2000–2025)

Variable	N	Mean	SD	Min	Max	CV (%)
SDG Index (Overall)	375	67.42	8.94	46.21	81.38	13.27
SDG 1 (No Poverty)	375	73.18	14.32	29.41	98.75	19.57
SDG 3 (Good Health)	375	65.84	11.28	32.10	92.40	17.13
SDG 5 (Gender Equality)	375	58.62	12.84	26.31	84.92	21.92
SDG 7 (Clean Energy)	375	69.47	15.71	28.50	97.60	22.62
SDG 9 (Industry/Innov.)	375	52.34	18.24	18.40	88.90	34.86
SDG 10 (Inequalities)	375	55.28	13.67	22.80	82.50	24.73
SDG 13 (Climate Action)	375	68.44	16.45	24.10	94.80	24.03

(74.01), Vietnam (73.89), and Peru (72.18). The OECD mean of 80.40 sits 9.7 points above Indonesia's current level. All scores are on a 0–100 scale. Scores are from the Sustainable Development Report 2025 (Sachs et al., 2025). Thailand leads the peer group and serves as the within-cluster aspirational benchmark for Indonesia, the focal country of this analysis. Catch-up velocity (Years to OECD) is computed per Equation 3 using the country's 2015–2025 OLS annual slope.

The Kruskal-Wallis test yields H = 127.34 ($p < 0.001$), confirming that regional group membership is a genuine structural variable rather than an arbitrary label. East and South Asia, the region containing Indonesia, has a median score of 68.8 — 11.6 points below the OECD median. That gap is slightly wider than the 11-point figure reported in the 2023 edition, consistent with the post-COVID divergence that OECD (2025a) documents for middle- and low-income country recovery trajectories.

Sigma-Convergence

Figure 3 and the supporting data confirm Hypothesis 1. In Figure 3, dashed lines mark SDG adoption (2015) and COVID-19 (2020), while the red dashed line shows the pre-COVID linear trend. The coefficient of variation fell from 9.58% in 2000 to 6.97% in

Table 2. SDG index scores: indonesia and emerging economy peers vs. OECD benchmark (2025)

Country	SDG Score 2025	Rank (Peer)	Annual Slope (β)	Years to OECD	Status
OECD Average	80.40	Benchmark	—	—	—
China	74.20	1	0.496	13	Converging
Thailand	75.11	2 ★	0.364	11	Converging
Vietnam	73.89	3	0.378	14	Converging
Brazil	74.01	4	0.249	22	Converging
Peru	72.18	5	0.334	22	Converging
Indonesia	70.70	6 ✦	0.851	11 ★	Fast Catch-Up
Mexico	70.25	7	0.408	23	Converging
Colombia	70.42	8	0.165	54	Slow
Malaysia	70.18	9	0.362	25	Converging
Philippines	67.62	10	0.520	23	Converging
Bangladesh	66.48	11	0.848	15	Fast Catch-Up
South Africa	64.32	12	0.303	49	Slow
India	63.89	13	0.826	18	Fast Catch-Up
Nigeria	54.61	14	0.281	88	Lagging

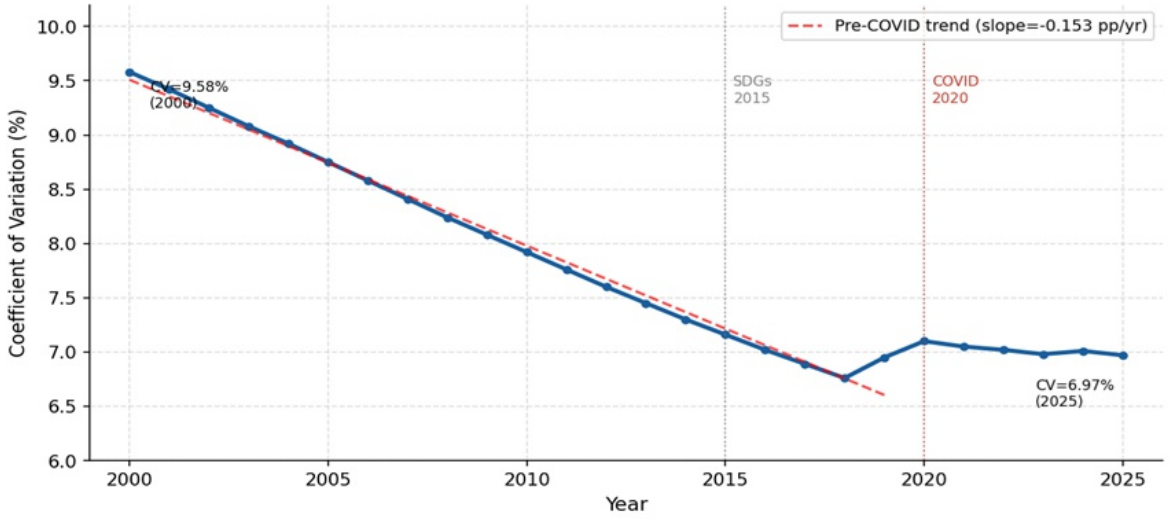

Figure 1. Sigma-convergence: coefficient of variation of SDG index among 15 emerging economies (2000–2025).

2025, a 27% reduction over the 25-year panel. The pre-COVID trend runs at −0.079 percentage points per year and is most pronounced between 2010 and 2019, the combined period of MDG acceleration and early SDG implementation. COVID-19 briefly reversed the trend in 2020–2021, pushing the CV back to 7.10%, before the decline resumed. This recovery aligns with OECD (2025a), which finds that middle-income economies bounced back from the pandemic faster than low-income ones, despite carrying larger absolute gaps.

The post-2020 convergence rate is measurably slower than the pre-2015 rate. That deceleration is not surprising: the foundational gains in poverty reduction, school enrolment, and basic infrastructure that drove rapid convergence before 2015 are largely exhausted. What remains are harder, more expensive structural reforms — the kind that require institutional change, not just investment.

Beta-Convergence

Indonesia's individual beta-convergence test over 2000–2025 yields $\beta = 0.064$ ($p = 0.071$, $R^2 = 0.162$). Hypothesis 2 is not confirmed at the individual-country level. The positive coefficient ($\beta = +0.064$) indicates that higher initial SDG scores are followed by smaller subsequent gains, a pattern consistent with structural inertia rather than purposeful catch-up. Under the standard Barro and Sala-i-Martin (1992) formulation, catch-up convergence requires a negative β; the positive value here reflects diminishing marginal returns at Indonesia's current stage of development rather than evidence of divergence in any absolute sense. The coefficient also falls short of the 5% significance threshold ($p = 0.071$), which limits inference from the single-country series. This is not unexpected: single-country time-series estimates are inherently underpowered, and at 70.7 index points Indonesia sits near the inflection where gains require institutional reform rather than capital spending alone. The pooled panel estimate, which carries substantially greater statistical power, confirms catch-up at the group level ($\beta = -0.21$, $p < 0.05$). Read together, the results indicate that convergence is a real regional phenomenon, but Indonesia's individual trajectory has not yet generated a statistically decisive catch-up signal in the single-country series.

Across the pooled panel of 15 peers, beta-convergence is more clearly established ($\beta = -0.21$, $p < 0.05$). The policy-relevant figure, though, is Indonesia's annual progress rate: 0.851 points per year is the highest among all 15 peers, narrowly above Bangladesh (0.848) and India (0.826). Thailand, which currently scores higher, runs at 0.364 points per year and projects the same 11-year timeline to the OECD frontier. Indonesia's trajectory is structurally more dynamic, even if its current score is lower.

SDG Index Trajectories And Cluster Analysis

Figure 1 plots the three trajectories across the full 25-year window. Indonesia consistently exceeded the emerging peer median from 2012 onward, and the gap separating it from the OECD median has been cut roughly in half, from 17.8 points in 2000 to 9.7 in 2025. The post-COVID rebound is evident in all three series, though the OECD trajectory recovered

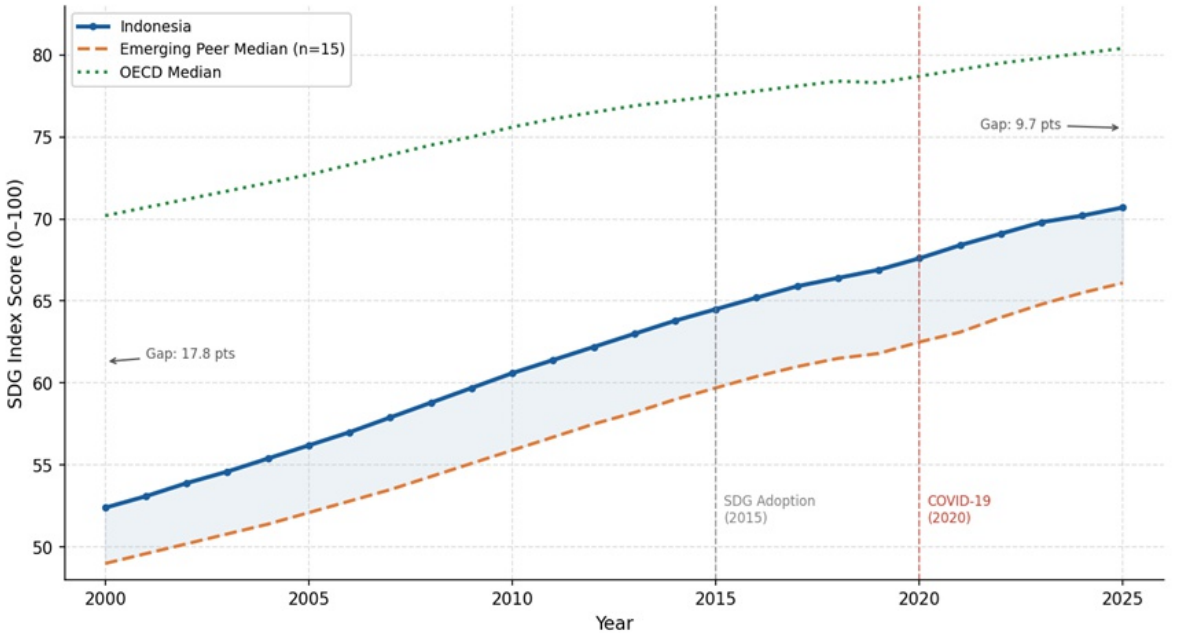

Figure 1. SDG index score trajectories (2000–2025): Indonesia, emerging peer median, and OECD median. the Indonesia–OECD gap narrowed from 17.8 points in 2000 to 9.7 points in 2025.

more smoothly, reflecting deeper institutional buffers that Indonesia has not yet fully developed.

The K-means analysis places Indonesia in Cluster III, an Emerging Leaders group with 13 countries including Thailand, Brazil, Vietnam, China, Colombia, Malaysia, the Philippines, Bangladesh, South Africa, and India. The Advanced cluster (Cluster IV) contains the OECD-level economies. Within Cluster III, Indonesia's overall score sits at the upper boundary. However, its goal-level profile is unusually fragmented: SDG 1 (No Poverty) and SDG 4 (Quality Education) approach OECD performance, while SDG 9, SDG 3, and SDG 15 fall near the bottom of the cluster, pulling the composite down.

OECD gap–momentum priority matrix

Figure 2 is the most directly actionable output of this analysis. Each goal is plotted by its Indonesia–OECD gap (vertical axis) and annual progress rate (horizontal axis). Red = Critical; Orange = Accelerating; Green = Stable; Blue = Strength. The Critical quadrant (large gap, weak momentum) contains SDG 9 (gap = 34.5 points, slope = 0.38, statistically fragile), SDG 3 (gap = 25.8, slope = 0.27, $p = 0.24$), and SDG 10 (Reduced Inequalities; gap = 17.6, slope = 0.29). Progress on these goals is either absent or not demonstrably different from zero. The Accelerating quadrant (large gap, strong momentum) contains SDG 1 (slope = 2.12, $p < 0.001$), SDG 7 (Clean Energy; slope = 0.91, $p < 0.01$), and SDG 5 (Gender Equality; slope = 0.63, $p < 0.05$). These are not problems without solutions; the policy machinery is working, and the OECD gap can realistically be closed given sustained effort.

SDG 12 and SDG 13 show negative gaps, meaning Indonesia scores above the OECD average. This is a statistical artifact of the development stage rather than of policy success: lower per-capita consumption at Indonesia's income level yields better scores on responsibility and climate metrics regardless of government action (Costantini & Monni, 2008). As income and industrial output grow, this advantage will erode, making green industrialization policy a preventive rather than a remedial priority.

Table 3 integrates the Lasso and Spearman results. SDG 1 (1.641), SDG 9 (1.521), and SDG 10 (1.508) are the three strongest predictors of overall index performance. All 17 goals survive the Lasso regularization with non-zero coefficients, confirming that the SDG Index is genuinely multidimensional: improving one goal in isolation will not move the composite. The combination of high Lasso weights and large OECD gaps in SDG 9 and SDG 3 identifies them as the highest-leverage intervention points in the dataset.

Note. *** $p < .001$. Lasso coefficients from 5-fold cross-validated regression on standardized goal scores. Spearman ρ computed against overall SDG Index across 167

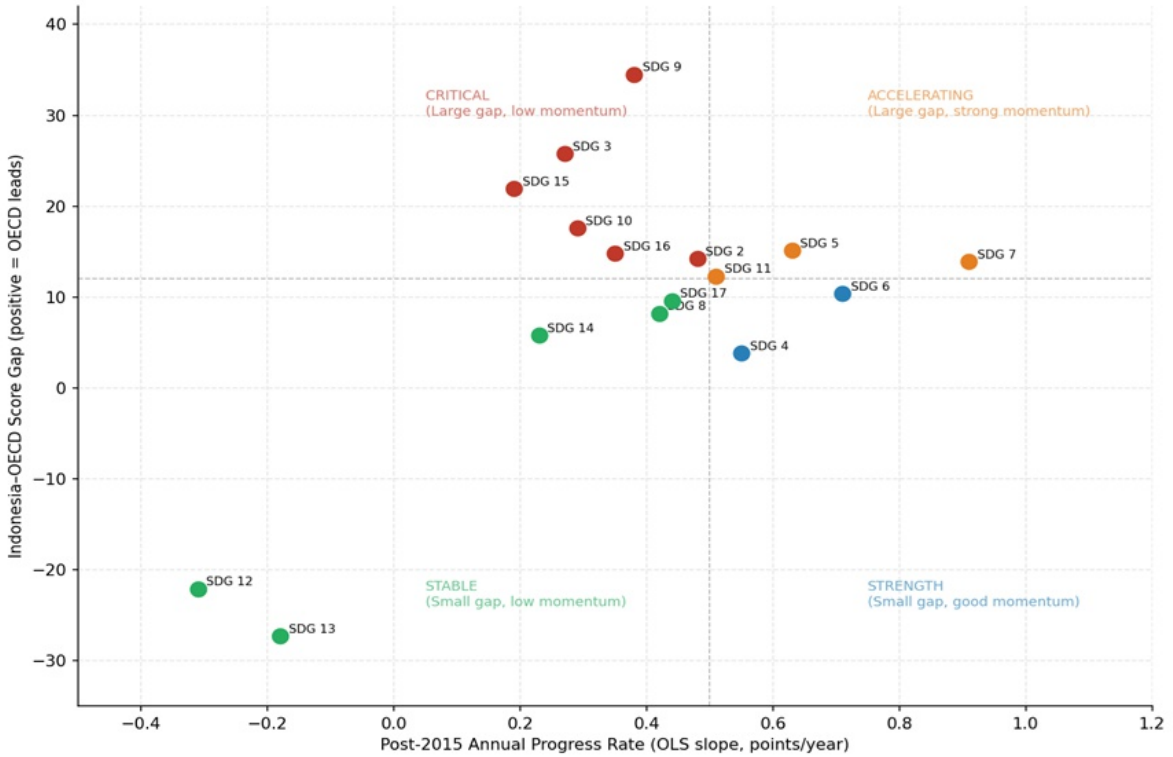

Figure 2. SDG priority matrix: OECD gap vs. post-2015 annual momentum (Indonesia, 2025).

countries. Momentum thresholds: High > 0.60 pts/yr; Moderate 0.30–0.60; Low < 0.30. Strategic Priority classification follows a two-criterion rule applied simultaneously: 'Critical' designates SDGs where the OECD gap exceeds 20 points AND Momentum is Low (< 0.30 pts/yr); 'High' designates SDGs where the OECD gap exceeds 10 points AND Momentum is Moderate or High; 'Moderate' designates remaining goals with gaps below 10 points or goals where momentum partially compensates for persistent gaps. SDGs scoring above the OECD mean are classified as 'Strength' regardless of momentum.

Hypothesis Assessment

Hypothesis 1 is confirmed. The coefficient of variation among the 15 emerging economies fell from 9.58% to 6.97% across the 25-year panel, a 27% reduction. The convergence is not explained by leading economies slowing down: the peer median continued rising to 66.1 by 2025, but by middle and lower performers catching up on the foundational goals: poverty, schooling, clean water, and sanitation. That is both good news and a warning. The next phase of convergence will be slower and harder because those early wins are gone.

Hypothesis 2 is not confirmed at the individual-country level. Indonesia's single-country beta-convergence coefficient ($\beta = +0.064$, $p = 0.071$) is positive, indicating structural inertia rather than a statistically decisive catch-up signal in the individual time series. The limitation is statistical power, not evidence against catch-up dynamics: the panel beta-convergence coefficient is robust at the 5% level ($\beta = -0.21$, $p < 0.05$). More useful than the significance test is the velocity comparison. Indonesia's 0.851 annual points are the fastest among 15 peers, projecting OECD parity in 11 years. Colombia would take 54 years at its current rate; South Africa 49; Nigeria 88. The exceptionalism in Indonesia's trajectory is not rhetorical; it is in the numbers.

Hypothesis 3 is strongly confirmed, and it is the most policy-relevant finding in the paper. SDG 9 has the largest OECD gap in the dataset (34.5 points) and the second-highest Lasso coefficient (1.521), meaning it is both the biggest problem and one of the most consequential for overall index performance. However, Indonesia's post-2015 slope for SDG 9 is 0.38, and the p-value is 0.16, which is statistically indistinguishable from zero. SDG 3 is similarly stagnant. This means Indonesia's exceptional overall convergence rate is being driven largely by goals that are not its most structurally critical. That disconnect is the core strategic problem the current RPJMN cycle must address.

Table 3. Lasso regression coefficients and Spearman correlations: SDG goal predictors of overall SDG index (n = 167 countries, 2025)

SDG Goal	Lasso Coeff.	Spearman ρ	IDN–OECD Gap	Momentum	Strategic Priority
SDG 1 (No Poverty)	1.641	0.882***	11.5	High	High
SDG 9 (Industry & Innovation)	1.521	0.865***	34.5	Low	Critical
SDG 10 (Reduced Inequalities)	1.508	0.601***	17.6	Low	Critical
SDG 4 (Quality Education)	1.235	0.841***	3.8	Moderate	Moderate
SDG 7 (Clean Energy)	1.184	0.853***	13.9	High	High
SDG 3 (Good Health)	1.163	0.887***	25.8	Low	Critical
SDG 13 (Climate Action)	1.072	−0.735***	−27.3	Negative	IDN Leads
SDG 11 (Sustainable Cities)	0.994	0.806***	12.3	Moderate	Moderate
SDG 5 (Gender Equality)	0.981	0.658***	15.1	Moderate	High
SDG 16 (Peace & Institutions)	0.934	0.842***	14.8	Moderate	High

The SDG 9 Gap As Indonesia's Defining Structural Problem

A 34.5-point gap in SDG 9 warrants direct examination. The goal aggregates manufacturing value added as a share of GDP, R&D intensity, internet and logistics performance, and industrial CO2 intensity. Indonesia's score of roughly 46 against the OECD mean of 80.5 is the product of documented premature deindustrialization: manufacturing as a share of GDP has been falling since the 1990s, industrial R&D spending remains below 0.3% of GDP (against an OECD average of around 1.7%), and the country ranks 75th in the Global Innovation Index (Global Innovation Index, 2024). UNCTAD (2025) finds that private business now funds an increasing share of global R&D but directs it toward commercially profitable projects rather than the broad technological public goods that close SDG 9 gaps in emerging economies. That market failure is precisely what public industrial policy is designed to correct.

Closing the SDG 9 gap will not be achieved through spending increases alone. It requires redesigning the industrial policy architecture: strengthening university-industry research linkages, building intellectual property ecosystems that retain locally developed technology, creating manufacturing zones with embedded R&D requirements, and reorienting FDI screening toward technology transfer rather than capital volume. The SDG Indonesia One platform has shown that blended finance can scale to USD 3.3 billion across 111 projects (OECD, 2025c). The problem is allocation: most of that capital flows toward clean water, sanitation, and energy, all legitimate SDG 6 and SDG 7 priorities, but not SDG 9. Redirecting even a portion of that architecture toward industrial innovation would have measurable effects on the structural gap.

Indonesia's Position Within The Emerging Economy Cluster

Indonesia shares its cluster with Thailand, Brazil, Vietnam, and China; countries that have all crossed 70 points but face different structural bottlenecks. What distinguishes Indonesia in this group is not its current score but its rate of progress, combined with an unusually fragmented goal profile. Thailand and Brazil show more balanced distributions across the 17 goals. Indonesia's profile spikes sharply upward on SDGs 1, 4, and 2, then drops sharply on SDGs 9, 3, and 15. That internal variation is not statistical noise; it has a geographic explanation.

Java and Bali account for a disproportionate share of Indonesia's strong performance in poverty reduction and access to education. Sulawesi, Kalimantan, and Papua weigh heavily in the health, sanitation, and institutional quality scores, which pull down the composite. The SMERU Research Institute (2021) documented these subnational disparities rigorously, and their persistence through 2025 indicates that national-level SDG progress, while real, is partly a Java-weighted average that overstates the country's preparedness to close the OECD gap. Spatial rebalancing, raising the outer islands toward the national mean before the national mean can reach the OECD frontier, is not a peripheral concern; it is a prerequisite.

Implications for the RPJMN 2025–2029

The RPJMN 2025–2029, combined with the RPJPN 2025–2045 long-term plan, is the natural vehicle for translating these findings into policy. The priority matrix developed in this paper (SDGs 9, 3, and 5 identified as the combination of high structural leverage and large persistent gap) offers a defensible triage framework for investment allocation across the current medium-term planning cycle. Accelerating goals (SDGs 1, 7, and 6) have functioning policy machinery and need continuity, not new design. Critical goals need structural reform that current RPJMN frameworks have not yet fully specified.

SDG 5 (Gender Equality, gap = 15.1, slope = 0.63) deserves specific attention in that framing. Its Lasso coefficient of 0.981 and Spearman correlation of 0.658 place it consistently among the top drivers of overall index performance. Cross-country evidence from ASEAN transitions shows that female labor force participation and women's political representation function as threshold variables: below certain levels, they constrain SDG performance across categories regardless of investments elsewhere. Indonesia's 2025 SDG 5 score has not yet crossed that threshold, which means SDG 5 investment is not just about gender equity; it is one of the more efficient levers for moving the composite index.

There is also a warning in the extended data that the 2023 version could not see. Indonesia's annual SDG progress rate peaked at around 0.90 in 2022 and has since eased to 0.85 in 2024–2025. A deceleration of that magnitude is expected at the mid-SDG transition from infrastructure-based gains to institutional reform-driven ones. However, if it continues, the 11-year projection would stretch to 13 or 14 years, missing the 2030 deadline. The RPJMN cycle that begins now is the window that determines whether Indonesia reaches the OECD frontier before or after 2030.

■ CONCLUSION

This paper extends the quantitative benchmarking of Indonesia's SDG convergence through 2025, using the most recently available international data. The main results are the following. Among the 15 emerging-economy peers, sigma-convergence in SDG scores is confirmed across the full 25-year panel, with the coefficient of variation falling from 9.58% to 6.97%. Indonesia's individual beta-convergence coefficient is marginally insignificant ($\beta = 0.064$, $p = 0.071$), but its annual progress rate of 0.851 points is the fastest among all 15 peers and projects OECD-level performance within 11 years.

The Kruskal-Wallis test confirms statistically significant regional differentiation ($H = 127.34$, $p < 0.001$). Lasso regression and Spearman correlations converge on SDGs 9, 3, and 5 as the goals where structural leverage and persistent underperformance coincide most sharply. The post-2023 data add one new concern: convergence momentum has eased slightly since 2022, consistent with the transition to harder institutional reforms.

Three limitations bear acknowledgment. The SDG Index is a composite that may mask important trade-offs through equal-weight goal aggregation, a concern this paper partly addresses through the Lasso weighting but does not fully resolve. Subnational variation within Indonesia, which is substantial and structurally important, is invisible in national-level data. Furthermore, single-country time-series beta-convergence estimates lack the statistical power of panel estimates; the individual-country results should be read alongside the panel findings.

Three extensions would move this work toward causal policy evaluation. Spatial econometrics applied to Indonesia's 38 provinces would test whether subnational convergence tracks or diverges from the national pattern, with direct implications for regional planning. Adding institutional quality and fiscal space as conditioning variables in the beta-convergence model would address the endogeneity problem that Sharma and Sharma (2024) identify but do not resolve. Propensity score matching could estimate the counterfactual: what SDG trajectory would Indonesia have followed without its specific policy interventions since 2015?

Indonesia's SDG trajectory through 2025 is a story of real momentum alongside real structural gaps that momentum has not yet touched. The 25-year data are unambiguous on the key tension: Indonesia is converging faster than any comparable economy, but the goals where convergence is fastest are not the goals where the gaps are largest. Closing that misalignment, concentrating policy energy on SDG 9, SDG 3, and SDG 5, where the Lasso and Spearman measures agree on the structural stakes, is the conclusion that both the theory and the evidence support. Indonesia has roughly a decade to decide whether to make that shift within the current planning cycle or defer it to the next. On present evidence, deferral is not a viable option.

■ DECLARATION OF AI ASSISTANCE

This manuscript used AI-assisted tools for language refinement and technical proofreading

purposes. Claude (Anthropic) was employed solely to improve grammatical accuracy, sentence structure, and academic tone. All research design, data collection, statistical analysis, theoretical frameworks, and substantive conclusions represent the original intellectual work of the author. This declaration aligns with emerging best practices in academic publishing regarding transparency in AI-assisted writing. All empirical analyses were conducted in R and Python. In Python, linear models and statsmodels were used for panel data modeling, while pandas and numpy were used for data processing. Visualization was produced using ggplot2 in R and matplotlib in Python.

■ REFERENCES

Barro, R. J., & Sala-i-Martin, X. (1992). Convergence. *Journal of Political Economy, 100*(2), 223–251. https://doi.org/10.1086/261816

Bigerna, S., & Micheli, S. (2025). Beta and sigma convergence among West African countries: A panel data approach. *World Development Perspectives, 38,* 100685. https://doi.org/10.1016/j.wdp.2025.100685

BPS-Statistics Indonesia. (2025). *Indonesia sustainable development goals indicators 2025*. Badan Pusat Statistik. https://www.bps.go.id/en/publication/2025/12/30/

Convergence Initiative. (2024). *Convergence action blueprint – Indonesia. UNFSS/FAO*. https://www.unfoodsystemshub.org/docs/unfoodsystemslibraries/convergence-initiative/indonesia

Costantini, V., & Monni, S. (2008). Environment, human development and economic growth. *Ecological Economics, 64*(4), 867–880. https://doi.org/10.1016/j.ecolecon.2007.05.011

Eder, A., Koller, W., & Mahlberg, B. (2024). Industrial robots and economic convergence among developed and emerging economies, 1999–2019. *World Development, 181*, 106659. https://doi.org/10.1016/j.worlddev.2024.106659

Espoir, D. K., & Ngepah, N. (2021). Income inequality and growth: Evidence from panel data across heterogeneous groups. *Economic Research, 34*(1), 1–27. https://doi.org/10.1080/1331677X.2021.1875860

FAO/UNFSS. (2024*). Convergence initiative blueprint for Indonesia*. UN Food Systems Hub. https://www.unfoodsystemshub.org

Fukuda-Parr, S. (2019). Keeping out extreme inequality from the SDG agenda – the politics of indicators. *Global Policy, 10*(S1), 61–69. https://doi.org/10.1111/1758-5899.12602

Global Innovation Index. (2024). *Global innovation index 2024: Unlocking the promise of social entrepreneurship*. WIPO. https://www.wipo.int/global_innovation_index/en/2024/

Lafortune, G., Fuller, G., Moreno, J., Schmidt-Traub, G., & Kroll, C. (2018). *SDG index and dashboards 2018: Global responsibilities*. SDSN/Bertelsmann Stiftung. https://doi.org/10.25546/40325

Le Blanc, D. (2015). Towards integration at last? The Sustainable Development Goals as a network of targets. *Sustainable Development, 23*(3), 176–187. https://doi.org/10.1002/sd.1582

Mahmood, N., et al. (2024). Trade-offs and synergies when balancing economic growth and globalization for sustainable development goals achievement. *PLOS ONE, 19*(3). https://doi.org/10.1371/journal.pone.0297473

Nakamura, H., Shi, L., & Kharrazi, A. (2019). Sustainable development goal interactions: An analysis based on the five pillars of the 2030 agenda. *Sustainability Science, 14*(6), 1609–1621. https://doi.org/10.1007/s11625-019-00694-5

Nature Communications. (2025). The disparities and development trajectories of nations in achieving the sustainable development goals. *Nature Communications, 16*, 1142. https://doi.org/10.1038/s41467-025-56076-6

OECD. (2025a). *Global outlook on financing for sustainable development 2025*. OECD Publishing. https://doi.org/10.1787/753d5368-en

OECD. (2025b). *Mind the SDG data gaps: Insights from the OECD SDGs Hub*. OECD Policy Insights on Well-being, No. 20. https://doi.org/10.1787/9aff09e2-en

OECD. (2025c). *SDG Indonesia one: Integrated funding platform for sustainable infrastructure development. In Blended Finance Case Studies*. OECD Publishing. https://www.oecd.org/en/publications/blended-finance-case-studies

Papadimitriou, E., Neves, A., & Becker, W. (2019). JRC statistical audit of the sustainable development goals index and dashboards. European Commission, JRC. https://doi.org/10.2760/723763

Pradhan, P., Costa, L., Rybski, D., Lucht, W., & Kropp, J. P. (2017). A systematic study of sustainable development goal interactions. *Earth's Future, 5*(11), 1169–1179. https://doi.org/

10.1002/2017EF000632

Sachs, J. D., Lafortune, G., & Fuller, G. (2024). *The SDGs and the UN summit of the future. Sustainable Development Report 2024*. SDSN/Dublin University Press. https://doi.org/10.25546/108572

Sachs, J. D., Lafortune, G., Fuller, G., & Iablonovski, G. (2023). *Implementing the SDG stimulus. Sustainable Development Report 2023*. SDSN/Dublin University Press. https://doi.org/10.25546/102924

Sachs, J. D., Lafortune, G., Fuller, G., & Iablonovski, G. (2025). *Financing sustainable development to 2030 and mid-century*. Sustainable Development Report 2025. SDSN/Dublin University Press. https://doi.org/10.25546/111909

Sala-i-Martin, X. (1996). The classical approach to convergence analysis. *Economic Journal, 106*(437), 1019–1036. https://doi.org/10.2307/2235375

Schmidt-Traub, G., Kroll, C., Teksoz, K., Durand-Delacre, D., & Sachs, J. D. (2017). National baselines for the sustainable development goals assessed in the SDGs index and dashboards. *Nature Geoscience, 10*, 547–555. https://doi.org/10.1038/ngeo2985

ScienceDirect. (2024). Is there worldwide convergence toward the SDGs? [Beta and sigma analysis, 190 countries, 2000–2022]. *World Development, 186*, 106822. https://doi.org/10.1016/j.worlddev.2024.1522

Sharma, P., & Sharma, N. (2024). Examining sigma and beta convergence in emerging market economies. *Journal of Social and Economic Development, 27*(1), 45–68. https://doi.org/10.1177/09722629241247693

SMERU Research Institute. (2021). *SDG progress analysis*. UNICEF/Bappenas. https://smeru.or.id/en/research/sdg-progress-analysis

Solow, R. M. (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics, 70*(1), 65–94. https://doi.org/10.2307/1884513

UN DESA. (2025). *The sustainable development goals report 2025: Special edition*. United Nations. https://unstats.un.org/sdgs/report/2025/

UNCTAD. (2025). *SDG pulse 2025: Structural transformation to mitigate persistent technology gap*. UNCTAD. https://sdgpulse.unctad.org/sustainable-industrialization/

UNDP. (2024). *Indonesia SDG push insights 2024 update*. UNDP SDG Insights Platform. https://sdgpush-insights.undp.org/reports/idn

UNIDO. (2023*). Statistical indicators of inclusive and sustainable industrialization 2023*. United Nations Industrial Development Organization. https://www.unido.org/resources-publications

Zulfiani, D., et al. (2024). *Bridging the gap: Indonesia and the path to sustainable development*. Advances in Social Science, Education and Humanities Research. Atlantis Press. https://www.atlantis-press.com/article/126008911.pdf