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Beyond HDI and Per Capita Income: Constructing a Composite Economic Development Index (CEDI) for a Multidimensional Assessment

by

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Abstract

The measurement of economic development remains central to both academic inquiry and policy formulation. Traditional indicators such as Per Capita Income (PCI) and the Human Development Index (HDI) have long dominated development discourse, yet their limitations—ranging from mono-dimensionality to insensitivity to institutional and structural change—have increasingly constrained their utility. This paper introduces the Composite Economic Development Index (CEDI), a novel, multidimensional framework that captures the complex, interrelated drivers of sustainable economic progress. Unlike PCI, which reflects only income averages, and HDI, which narrowly aggregates education, income, and life expectancy, the CEDI encompasses six core dimensions: Economic Structure and Diversification; Institutional and Governance Quality; Human Capital and Health; Technological Readiness and Innovation; Environmental Sustainability; and Employment and Labour Market Inclusion. The construction of the CEDI employs Principal Component Analysis (PCA) to derive empirically grounded weights, thereby addressing methodological shortcomings in existing indices. By integrating structural transformation, productive capacity, institutional integrity, and inclusion, the CEDI provides a more comprehensive and diagnostic measure of development. The paper argues for the superiority of CEDI over HDI and PCI based on its multidimensional depth, structural and institutional sensitivity, balance and equity considerations, and enhanced policy relevance. The CEDI not only captures current outcomes but also the underlying conditions that determine a nation's long-term development trajectory. Its adaptability and diagnostic accuracy make it particularly valuable for developing countries, where traditional indicators frequently mask critical dimensions of development. The study concludes by recommending the adoption of CEDI by national governments and international agencies as a superior benchmarking and planning tool in the pursuit of inclusive, resilient, and sustainable economic development.

Key words: Economic Development, HDI, Per Capita Income, composite index, institutional quality, structural transformation, inclusive growth, policy framework, CEDI.

Jel-O10; O11; O43; C43; I32,

1. Introduction

The measurement of economic development continues to be a central theme in both academic research and policy formulation, particularly in the context of cross-country comparisons and performance benchmarking. Despite the proliferation of growth-oriented indicators over the last several decades, capturing the true essence of development—encompassing structural transformation, human capabilities, institutional integrity, and environmental sustainability—remains a complex undertaking. Traditionally, two measures have dominated the literature: Per Capita Income (PCI) and the Human Development Index (HDI). While each has offered valuable insights into the trajectory of nations, they fall short of capturing the full spectrum of what economic development entails.

Per Capita Income has long served as a proxy for economic progress, reflecting the average income earned by individuals in an economy. It is rooted in classical economic models that equate higher income with improved welfare, assuming that increases in output naturally translate to improved living standards. This assumption, however, has come under increasing scrutiny. Critics argue that PCI is not only mono-dimensional but also structurally biased, as it fails to account for the quality of income distribution, social services, employment structure, or sustainability. Moreover, because it is an average, PCI obscures disparities across regions, sectors, and populations (Stiglitz, Sen, & Fitoussi, 2009). For instance, economies with substantial income from extractive sectors like oil may exhibit high PCI figures, yet their populations may suffer from underemployment, poor governance, and institutional fragility (Sala-i-Martin & Subramanian, 2013). In response to these limitations, the Human Development Index was introduced by the United Nations Development Programme (UNDP) in 1990. HDI represents a significant advancement by incorporating life expectancy, education (measured by mean and expected years of schooling), and income. It was inspired by the capabilities approach articulated by Amartya Sen, which emphasized that development should be assessed by the real freedoms people enjoy rather than by material wealth alone (Sen, 1999). Despite this conceptual innovation, the HDI remains methodologically limited. It focuses on only three dimensions, assumes linear substitutability between them, and does not sufficiently account for structural or institutional features. For example, two countries with similar HDI values may differ markedly in institutional quality, technological readiness, or environmental performance—differences that are critically relevant for development policy and sustainability (Anand & Sen, 2000).

Moreover, the HDI's aggregation method—the geometric mean—imposes equal weight across its three components, a decision that is often normatively unjustified and empirically inconsistent. Some scholars have pointed out that the rigidity of such an approach not only simplifies the development process but may also misguide policy by promoting improvements in areas with little marginal impact (Klugman, Rodríguez, & Choi, 2011). Furthermore, the HDI has not kept pace with the complex realities of development in the 21st century, which now require attention to governance, technological innovation, employment dynamics, and environmental resilience. These multidimensional facets are often essential in explaining why some countries transition to

sustained growth and inclusive development while others remain mired in poverty or stagnation (Acemoglu & Robinson, 2012; Rodrik, 2008). Against this backdrop, the need for a more comprehensive, multidimensional, and diagnostically robust measure of development becomes evident. This paper proposes the Composite Economic Development Index (CEDI), designed to address the conceptual and empirical limitations of existing indices by capturing a broader array of development dimensions. The CEDI is structured to provide a more detailed and integrative perspective of economic development—one that reflects the interconnectedness of structural transformation, institutional quality, technological infrastructure, environmental sustainability, human capital formation, and employment inclusiveness.

The rationale for the CEDI is grounded in contemporary development theory, which emphasizes that economic development is not merely a matter of increasing output but a process of transforming the productive structure of the economy, enhancing the capacities of individuals, and establishing institutions that support inclusive and sustained progress (Todaro & Smith, 2020). As such, the CEDI is not intended to replace the HDI or PCI outright but to supplement and expand upon them in a way that is both theoretically rigorous and empirically operational. In constructing the Composite Economic Development Index (CEDI), we adopt a multidimensional framework that captures the complex and interrelated drivers of sustainable development. This index is grounded in six core dimensions, each selected for its relevance to the structural, institutional, and socio-economic dynamics that underpin long-term development outcomes.

The first dimension, Economic Structure and Diversification, emphasizes the depth and complexity of a country's economic base. Here, we examine the share of industry and manufacturing in GDP, levels of export sophistication, and the broader measure of economic complexity. This dimension reflects the extent to which an economy is moving beyond primary commodities toward higher-value, knowledge-intensive production and trade.

Second, Institutional and Governance Quality is a critical pillar, given its strong correlation with economic performance and investor confidence. This dimension incorporates indicators from the Worldwide Governance Indicators, including regulatory quality, rule of law, and control of corruption. Robust institutions and effective governance create an enabling environment for inclusive growth, private sector development, and public service delivery.

The third dimension, Human Capital and Health, captures the breadth and depth of a country's investment in its people. Beyond traditional measures of educational attainment, this component accounts for workforce skill levels and access to essential health services, recognizing the centrality of a healthy, educated labour force in driving innovation, productivity, and social cohesion.

A fourth dimension, Technological Readiness and Innovation, reflects a country's capacity to adopt, adapt, and generate new technologies. It is measured using indicators such as internet penetration, expenditure on research and development (R&D), mobile

and broadband subscriptions, and patent filings. This dimension acknowledges the growing role of digital infrastructure and innovation in shaping modern economies.

Fifth, the Environmental Sustainability dimension addresses the ecological foundations of long-term development. This includes the proportion of renewable energy in the energy mix, carbon emissions per capita, and the effectiveness of environmental policies. As climate change and ecological degradation pose increasing risks, this component underscores the need for development pathways that are both resilient and sustainable.

Finally, the Employment and Labour Market Inclusion dimension focuses on the inclusiveness and dynamism of the labour market. Indicators such as labour force participation, unemployment rates, informal sector employment, and measures of job quality are used to assess how well the labour market integrates diverse segments of the population and provides decent work opportunities.

Together, these six dimensions offer a holistic view of economic development, moving beyond narrow income-based metrics to capture structural transformation, institutional integrity, social well-being, technological progress, environmental stewardship, and inclusive employment.

This multidimensional approach is designed not only to capture outcomes but also to reflect the underlying processes and conditions that drive development. For instance, while income may reflect the end result of economic activity, the composition of that income—whether it is derived from high-productivity sectors, diversified exports, or value-added manufacturing—provides insight into an economy's structural maturity. Similarly, institutional indicators help explain the variance in development performance among countries with comparable resource endowments, emphasizing the role of governance in shaping economic outcomes (North, 1990).

Methodologically, the CEDI uses Principal Component Analysis (PCA) to determine weights based on empirical variance across countries, ensuring that the index is statistically grounded and reflective of actual development differentials. This contrasts with the arbitrary equal weighting schemes found in many traditional indices. Furthermore, normalization techniques are applied to harmonize the scale of diverse indicators, reducing the risk of dimensional dominance and enhancing comparability. In addition to its theoretical and empirical innovations, the CEDI offers important practical advantages. First, it allows for disaggregation by dimension, enabling policymakers to pinpoint areas of strength and weakness. Second, it enhances cross-country and temporal comparability, making it suitable for both global rankings and national performance tracking. Third, by integrating non-income indicators with structural and institutional metrics, the index is better suited to the needs of developing countries, where income measures often fail to capture developmental realities such as informal employment, governance challenges, and environmental stress (Kanbur & Stiglitz, 2016).

2. Theoretical Framework and Justification

The Composite Economic Development Index (CEDI) represents an innovative and theoretically grounded approach to measuring economic development. It draws from

and integrates key insights from three influential traditions in economic thought: the capabilities approach advanced by Amartya Sen (1999), structuralist development theory rooted in the works of Raúl Prebisch and other Latin American economists of the 1950s, and the new institutional economics espoused by Douglass North (1990). Each of these schools of thought provides critical conceptual building blocks for understanding development not merely as growth in aggregate output, but as a dynamic, inclusive, and institutionally embedded process.

At its core, the capabilities approach offers a people-centred framework that moves beyond narrow welfare metrics to consider what individuals are actually able to do and to be—their "capabilities." Sen's critique of traditional utility- and resource-based measures of welfare laid the foundation for the Human Development Index (HDI), which expanded the evaluative space of development to include education and health. However, while the HDI introduced valuable social dimensions, it remains limited by its static structure and its failure to capture structural economic transformations or institutional capacity. The CEDI, by contrast, builds on Sen's emphasis on substantive freedoms but extends this perspective by embedding individual capabilities within a broader system of productive, institutional, and ecological arrangements.

From the structuralist perspective, the emphasis is placed on the importance of economic transformation, diversification, and upgrading in global value chains. Structuralists like Prebisch argued that the international division of labour, characterized by the persistent dependence of developing countries on primary commodity exports, led to deteriorating terms of trade and structural imbalances. Overcoming underdevelopment, therefore, required active state intervention to facilitate industrialization, build productive capacity, and transform the economic structure. The CEDI aligns closely with this tradition by incorporating indicators that measure the share of manufacturing in GDP, the level of economic complexity, and export diversification. These indicators are not only reflective of the productive base of the economy but are also essential for capturing long-run growth potential, technological diffusion, and resilience to external shocks.

New institutional economics, particularly the work of North, adds yet another critical dimension by highlighting the role of institutions—both formal (laws, regulations, policies) and informal (norms, conventions, social trust)—in shaping economic performance. North contends that institutions are the "rules of the game" that determine the incentives and constraints faced by economic agents. Development, from this perspective, is not simply about accumulating capital or enhancing technical efficiency but about fostering institutions that reduce transaction costs, support property rights, and promote contract enforcement. The CEDI operationalizes this institutional lens through the inclusion of governance indicators such as regulatory quality, control of corruption, and the rule of law, drawing from the Worldwide Governance Indicators database.

In contrast to traditional metrics such as per capita income (PCI), which captures average income but ignores distributional and structural aspects, and even the HDI, which is more comprehensive but still narrowly defined, the CEDI embraces a multidimensional understanding of development as an outcome of four interconnected pillars:

- i. *Productive Transformation (Structural Change)*: This refers to the shift of economic activity from low-productivity to high-productivity sectors, particularly from agriculture to industry and services. It encompasses industrial upgrading, technological adoption, and export sophistication. These changes are crucial for sustaining higher rates of growth, employment generation, and reducing vulnerability to external shocks.
- ii. *Institutional Effectiveness*: Strong institutions create an environment of predictability, trust, and efficient public service delivery. Institutional quality directly affects policy implementation, investor confidence, and the capacity of the state to coordinate development efforts. Institutional breakdowns, on the other hand, lead to policy reversals, rent-seeking, and market failures.
- iii. *Economic Sustainability*: This pillar captures the long-term viability of economic growth by integrating environmental indicators such as renewable energy use and carbon emissions per capita. It reflects an understanding that economic progress must not come at the expense of ecological degradation, especially in an era of climate uncertainty and resource scarcity.
- iv. *Social Inclusivity*: Development is incomplete if it does not translate into broader opportunities for all members of society. The CEDI includes measures of labour market participation, informal employment, and job quality to evaluate the inclusiveness of growth. This ensures that development is not just about expanding the pie but also about how the pie is distributed and who gets to participate in its creation.

By integrating these four dimensions, the CEDI addresses a key analytical distinction in development discourse: growth-led development versus transformation-based development. The former often entails increases in GDP driven by factor accumulation or commodity booms, with little change in underlying structures or institutions. Such growth can be volatile, exclusive, and unsustainable. In contrast, transformation-based development refers to a deeper and more durable process of economic upgrading, institutional reform, social progress, and environmental stewardship.

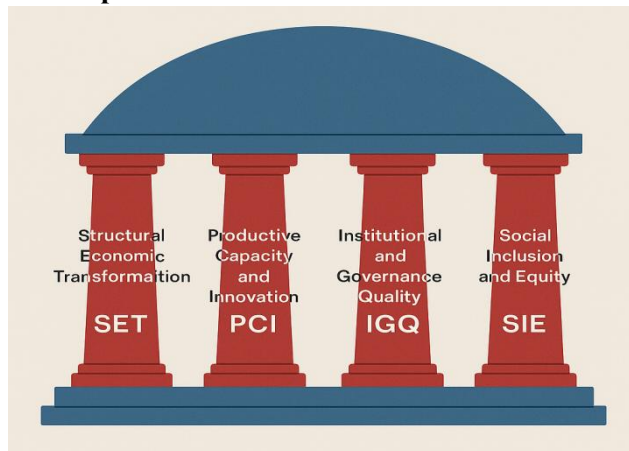
The multidimensionality of the CEDI enables it to capture the qualitative aspects of development that are often masked by traditional indicators. It recognizes that development is not unidimensional and cannot be reduced to a single economic statistic. Rather, it is a process that unfolds across multiple domains—economic, social, institutional, and ecological—and whose success depends on the coherence and mutual reinforcement of these dimensions. In sum, the CEDI offers a theoretically rigorous and empirically grounded alternative to conventional development indices. By embedding the insights of Sen, Prebisch, and North into a unified framework, it allows for a more holistic and policy-relevant assessment of development progress. This makes the CEDI particularly valuable for comparative analyses, diagnostic assessments, and evidence-based policymaking in both developing and developed country contexts.

3. Conceptual Components of the Composite Economic Development Index (CEDI): A Multidimensional Framework

Measures of economic development have long been central to economic analysis, planning, and policy formulation. Traditional indicators such as the Human Development Index (HDI) and Per Capita Income (PCI) have played an important role in shaping global and national development strategies. However, these indicators have been widely criticized for their narrow scope and failure to capture the complexity of development processes, particularly in terms of structural change, institutional performance, innovation capacity, and social equity. In response to these limitations, the Composite Economic Development Index (CEDI) has been conceptualized as a more comprehensive and multidimensional measure of economic development.

Rooted in the capabilities approach (Sen, 1999), structuralist development theory (Prebisch, 1950s), and the new institutional economics (North, 1990), the CEDI is designed to transcend the limitations of conventional development indicators by incorporating a richer set of dimensions. It integrates four critical and interrelated pillars that reflect the structural, institutional, productive, and social dimensions of development. Each pillar is represented by three quantitative and normalized indicators, resulting in a robust 12-indicator framework.

4. Conceptual Components of CEDI



Each of these pillars captures a distinct yet interconnected domain of economic development. Together, they form a holistic tool for diagnosing, monitoring, and comparing development progress across countries and over time.

Structural Economic Transformation (SET)

Structural Economic Transformation (SET) refers to the process by which an economy shifts from low-productivity, primary sectors such as agriculture to higher-productivity sectors like manufacturing and modern services. This transformation is at the heart of long-term economic development and is essential for sustainable growth and job creation. Three key indicators are used to measure this pillar:

a) Share of Manufacturing in GDP (%): This indicator reflects the relative importance of the industrial sector in the overall economy. Manufacturing is typically associated with economies of scale, higher productivity, export potential, and the capacity for technological advancement. A rising share of manufacturing in GDP suggests a movement towards industrialization and greater structural complexity.

b) Share of Modern Services in GDP (%): Modern services include financial services, ICT, professional services, and logistics, among others. An increase in this share indicates a shift towards a knowledge-based economy and diversification beyond traditional sectors. The dynamism of modern services contributes to productivity and facilitates structural upgrading.

c) Export Diversification Index (Inverted Herfindahl-Hirschman Index)

The degree of export diversification is a critical metric of resilience and economic complexity. A highly concentrated export base exposes an economy to external shocks, such as commodity price volatility. The inverted Herfindahl-Hirschman Index (HHI) is used to capture the level of diversification: a higher value indicates a more diverse and sophisticated export basket, consistent with structural transformation (Cadot *et al.*, 2011). Together, these three indicators provide a coherent picture of the depth and direction of structural transformation within an economy, reflecting its capacity to evolve and adapt to global economic dynamics.

Productive Capacity and Innovation (PCI)

Productive Capacity and Innovation (PCI) represents a country's ability to generate value through investment, technological progress, and creative knowledge application. It focuses on the inputs that drive long-term productivity and competitiveness.

a) Gross Fixed Capital Formation (% of GDP): Gross Fixed Capital Formation (GFCF) is a proxy for investment in physical assets such as machinery, buildings, and infrastructure. It indicates the extent to which an economy is investing in its productive capacity. A higher percentage implies that resources are being allocated to build the physical foundation for future growth.

b) Research and Development (R&D) Expenditure (% of GDP): Investment in R&D is essential for innovation and technological advancement. It signals an economy's commitment to knowledge creation and application, which are key drivers of productivity growth and competitiveness. Countries that allocate significant portions of GDP to R&D tend to have more dynamic and diversified economies (OECD, 2020).

c) Patents per Million People@: The number of patents filed per capita serves as a quantitative proxy for innovation output. While patents do not capture all forms of innovation, they are a strong indicator of the degree to which new ideas are being generated and potentially commercialized. Countries with high patenting activity tend to have strong innovation ecosystems, which can support higher value-added industries and services (WIPO, 2021). The PCI pillar thus encapsulates the capacity to accumulate capital, generate new knowledge, and translate it into economic advantage—a hallmark of sustained economic development.

Institutional and Governance Quality (IGQ)

The Institutional and Governance Quality (IGQ) pillar captures the enabling environment for development. Institutions determine how resources are allocated, how public services are delivered, and how markets function. Good governance enhances efficiency, reduces uncertainty, and fosters trust.

a) Rule of Law (World Governance Indicators): The rule of law measures the extent to which agents have confidence in and abide by the rules of society. It includes the quality of contract enforcement, property rights, the police, and the courts. Strong rule of law ensures that economic actors can operate within a predictable legal framework, reducing transaction costs and fostering investment.

b) Regulatory Quality: Regulatory quality assesses the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Poor regulatory frameworks can create barriers to entry, stifle entrepreneurship, and lead to misallocation of resources.

c) Control of Corruption: Corruption undermines development by distorting resource allocation, reducing public investment efficiency, and eroding institutional credibility. Control of corruption captures perceptions of the extent to which public power is exercised for private gain. Reducing corruption enhances trust, improves service delivery, and increases the legitimacy of public institutions (Kaufmann, Kraay, & Mastruzzi, 2010).

The inclusion of institutional quality in CEDI underscores the view that economic outcomes are deeply embedded in institutional structures, norms, and governance mechanisms.

Social Inclusion and Equity (SIE)

Social Inclusion and Equity (SIE) represent the extent to which economic development translates into broad-based improvements in living standards and equal opportunities. It reflects both distributive outcomes and the inclusiveness of economic participation.

a) Gini Coefficient (Inverted): The Gini coefficient is the most widely used measure of income inequality. In CEDI, the inverted value is used, so that higher values indicate greater equity. High levels of inequality can hinder economic development by undermining social cohesion, depressing aggregate demand, and limiting access to opportunities for large segments of the population (OECD, 2015).

b) Labour Force Participation Rate (Total, %): Labour force participation reflects the extent to which the working-age population is actively engaged in the labour market. A higher participation rate suggests a more inclusive economy, where individuals—regardless of gender, background, or location—have opportunities to contribute productively. It is also an indicator of human capital utilization.

c) Access to Electricity (% of Population): Electricity access is a basic infrastructure requirement that enables households, firms, and institutions to function effectively. Lack of electricity access reflects deeper issues of exclusion and underdevelopment. It also constrains productivity, educational attainment, and health outcomes (IEA, 2021).

This pillar emphasizes that development must go beyond economic growth to encompass equity, opportunity, and access to basic services. Without inclusion, the fruits of growth may be concentrated and unstable.

Integrative Framework and Measurement

Each of the four pillars in CEDI consists of three normalized indicators, making a total of 12 components. These indicators are selected based on their theoretical relevance, empirical reliability, and cross-country availability. Normalization ensures comparability by transforming all variables into a common scale, typically ranging from 0 to 1. The aggregate CEDI score can then be computed using weighted or unweighted averages, depending on the normative assumptions about the importance of each pillar. The multidimensional nature of the CEDI allows for disaggregated analysis, enabling policymakers to identify specific areas of strength and weakness. For instance, a country may score highly on Productive Capacity and Innovation but poorly on Institutional Quality, signalling a need for governance reforms. Alternatively, a nation may achieve strong Structural Transformation but lag in Social Inclusion, raising concerns about the equitable distribution of development benefits. This structure allows for flexible yet rigorous analysis and supports the formulation of policies that are context-specific and evidence-based.

The Composite Economic Development Index (CEDI) offers a robust and multidimensional framework for assessing economic development. By integrating four foundational pillars—Structural Economic Transformation, Productive Capacity and Innovation, Institutional and Governance Quality, and Social Inclusion and Equity—the CEDI reflects a deeper, more nuanced understanding of development as a process of transformation, inclusion, and institutional evolution. Unlike narrower indicators such as PCI or HDI, the CEDI acknowledges that sustainable development depends not just on income or human capital, but also on the structural configuration of the economy, the innovation ecosystem, the quality of governance, and the inclusiveness of growth. It therefore aligns closely with contemporary development paradigms that emphasize complexity, resilience, and equity. As such, the CEDI can serve as a valuable tool for economists, policymakers, and development practitioners seeking to design and evaluate strategies for broad-based, long-term development. It reflects an evolution in thinking from simplistic, single-variable metrics toward integrated, multidimensional assessments—an approach better suited to the challenges of the 21st century.

5. Materials and Methods

Step 1: Normalization of Indicators

To ensure comparability, each indicator X_i is normalized using the min-max scaling:

$$X_i^* = \frac{X_i - X_{\min}}{X_{\max} - X_{\min}}$$

If the indicator has a negative implication for development (e.g., Gini coefficient), the inverse is taken:

$$X_i^* = 1 - \frac{X_i - X_{\min}}{X_{\max} - X_{\min}}$$

Step 2: Aggregation within Pillars

For each pillar P_j , compute the simple average of the three normalized indicators:

$$P_j = \frac{1}{3} \sum_{i=1}^3 X_i^*$$

Step 3: Composite Index Formation

The final CEDI score is the geometric mean of the four pillar scores:

$$CEDI = \{P_1 \cdot P_2 \cdot P_3 \cdot P_4\}^{1/4}$$

The geometric mean is chosen to penalize imbalance—low performance in any one pillar reduces the overall index more than with arithmetic averaging.

Argument for Superiority over HDI and PCI

The Composite Economic Development Index (CEDI) presents a more robust and policy-relevant alternative to conventional development metrics such as the Human Development Index (HDI) and Per Capita Income (PCI). While HDI and PCI have contributed meaningfully to comparative development discourse, they remain limited in scope and analytical utility in today's complex economic landscape. This section outlines the key dimensions through which the CEDI demonstrates its superiority.

Multidimensional Depth

A fundamental advantage of the CEDI lies in its multidimensional construction. Whereas HDI narrowly focuses on life expectancy, education, and income, and PCI is strictly an average income measure, the CEDI expands the evaluative space to include *structural economic transformation, productive capacity and innovation, institutional and governance quality, and social inclusion and equity*. This broader framework is better aligned with contemporary development thinking, especially that which emphasizes the quality of economic structures, technological dynamism, and inclusive institutions as vital elements of sustained development (Sen, 1999; Rodrik, 2007; North, 1990). As such, the CEDI not only measures development outcomes but also the foundational processes that drive them.

Structural and Institutional Sensitivity

Unlike HDI and PCI, which are outcome-centric and often lagging indicators, the CEDI embeds *forward-looking and enabling dimensions*. For example, it incorporates productive capacity—such as gross fixed capital formation—and institutional quality metrics that are crucial for long-term economic resilience and innovation. This sensitivity to *structural and institutional conditions* allows for a dynamic assessment of a country's development potential, not merely its current performance. It acknowledges that countries with similar HDI scores may have vastly different capacities to sustain development over time due to institutional weaknesses or lack of productive transformation (Acemoglu & Robinson, 2012).

Balance and Equity

While PCI is a purely aggregate measure that often obscures disparities in income distribution, HDI too has been criticized for averaging out inequality and failing to reflect intranational disparities in well-being (Klugman et al., 2011). In contrast, the CEDI addresses the "*growth without development*" paradox by incorporating indicators that speak to *social inclusion and equity*, such as gender employment ratios or access to basic services across regions. This makes the index more sensitive to the qualitative aspects of development, particularly those related to distributive justice, participation, and empowerment.

Policy Relevance

Perhaps most compellingly, the CEDI is designed with *actionability* in mind. By disaggregating development into distinct but interlinked pillars, it enables policymakers to identify specific gaps—be they in structural transformation, innovation systems, governance institutions, or inclusion mechanisms. This diagnostic power stands in sharp contrast to HDI and PCI, which offer limited guidance on the *how* of development. With CEDI, countries can tailor their strategies more precisely, thereby aligning development planning with empirical evidence and institutional priorities.

In sum, the CEDI emerges as a more comprehensive, forward-looking, and policy-relevant measure of economic development. It transcends the limitations of HDI and PCI by integrating structural, institutional, and equity-based considerations into a unified framework, making it an indispensable tool for contemporary development analysis and policy formulation.

6. Conclusion and Recommendations

The Composite Economic Development Index (CEDI) represents a significant advancement in the measurement of economic development, transcending the limitations of traditional indices such as the Human Development Index (HDI) and Per Capita Income (PCI). By integrating four critical dimensions—structural economic transformation, institutional and governance quality, productive capacity and innovation, and social inclusion and equity—the CEDI provides a multidimensional, forward-looking, and dynamic framework for evaluating development progress. Unlike narrow outcome-based metrics, the CEDI captures both the foundational capabilities and enabling conditions that drive sustainable growth and inclusive prosperity. This comprehensive approach makes the CEDI particularly valuable for economists, development practitioners, and policymakers seeking to assess not just where countries stand, but how well they are positioned for future advancement. Governments, multilateral institutions, and international development agencies are thus strongly encouraged to adopt or adapt the CEDI framework. It offers a more accurate and actionable basis for policy formulation, benchmarking performance, designing targeted interventions, and conducting meaningful international comparisons in an increasingly complex global economy.

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APPENDIX 1

Comparative Data of Known Development Indices with CEDI

Country	GNI	HDI	GII	CEDI Score
Norway	94390	0.961	52.7	1.00
Brazil	9600	0.754	34.1	~0.57
India	2389	0.633	36.6	~0.41
Nigeria	1880	0.548	18.4	~0.08

Interpretation of the CEDI Score Example

The **Composite Economic Development Index (CEDI)** provides a multidimensional lens on development, capturing income (GNI per capita), human well-being (HDI), and innovation (GII). By normalizing and averaging these components, we get a single score between 0 and 1, allowing for cross-country comparisons that go beyond income or HDI alone.

Norway – CEDI Score: 1.00

GNI per capita: \$94,390 — among the highest globally, reflecting immense economic productivity and wealth per citizen.

HDI: 0.961 — very high human development, indicating excellent life expectancy, education, and income.

GII: 52.7 — top-tier innovation, reflecting a strong ecosystem for research, technology, and institutional support.

Interpretation: Norway serves as a benchmark country, achieving maximum normalized values on all three indicators. Its perfect CEDI score of **1.00** confirms not only prosperity, but balanced progress across economic, social, and innovation dimensions.

Brazil – CEDI Score: ~0.57

GNI per capita: \$9,600 — solidly middle-income.

HDI: 0.754 — high human development, showing progress in health and education.

GII: 34.1 — moderate innovation capacity, suggesting some room for improvement in R&D, digital infrastructure, and institutional efficiency.

Interpretation: Brazil demonstrates **balanced progress**, with relatively strong HDI and innovation for its income level. Its mid-range CEDI of ~0.57 highlights the country's steady development path but also points to the need for greater productivity and innovation upgrades to match countries like Norway.

India – CEDI Score: ~0.41

GNI per capita: \$2,389 — low-middle-income, reflecting persistent poverty and inequality challenges.

HDI: 0.633 — medium human development; gains in literacy and life expectancy are notable, but still below global averages.

GII: 36.6 — relatively high innovation for its income level, especially in ICT services, startups, and patent output.

Interpretation: India's CEDI score reflects a **disparity between innovation strength and socioeconomic outcomes**. Innovation momentum is impressive for a lower-income country, but the modest HDI and GNI hold back the overall CEDI. This suggests that India's innovation capacity is not yet fully translating into inclusive economic and human development.

Nigeria – CEDI Score: ~0.08

GNI per capita: \$1,880 — low-income, volatile due to oil dependency and macroeconomic instability.

HDI: 0.548 — low human development; persistent gaps in health care, education, and income distribution.

GII: 18.4 — weak innovation ecosystem, limited R&D investment, inadequate infrastructure, and institutional constraints.

Interpretation: Nigeria's **CEDI score of ~0.08 is alarmingly low**, underscoring systemic weaknesses. The country faces a **triple challenge**:

- ✓ Weak productive capacity (low GNI)
- ✓ Underdeveloped human capital (low HDI)
- ✓ Poor innovation infrastructure (low GII)

This score reflects a **fragile development structure** that cannot be captured fully by HDI or PCI alone. Without significant investments in education, governance, digital infrastructure, and industrial policy, Nigeria risks remaining stuck in a low-development trap.

Policy Implications from the CEDI Rankings

Country Key Priority Area

Norway Sustain innovation leadership and ensure global knowledge spillovers

Brazil Boost R&D and digital infrastructure for higher value-added growth

India Convert innovation edge into broader human development outcomes

Nigeria Comprehensive structural reform in education, productivity, and governance

Conclusion

The CEDI reveals **development asymmetries** that HDI or income alone might obscure. For instance:

- ✓ **India outperforms Brazil on innovation** despite lower income.
- ✓ **Nigeria's HDI gains are insufficient** without corresponding progress in innovation and income.
- ✓ **Norway's model of balance** across all dimensions explains its top-tier status.

CEDI's strength lies in its capacity to unify and compare the structural underpinnings of development—offering richer insights for policymakers and development economists.