SUNTEXT REVIEWS

SunText Review of Economics & Business
ISSN: 2766-4775

Open Access
Research Article
Volume 6:4

Implementing S M Nazmuz Sakib's Economic Growth and Development Index (SASEGDI) in Global Economics and Business Analytics: A Data-Driven Review

Kessler RC[1,*], Rao G[2], Hazbi S[3], Ridker PM[4], Islam A[5], Shikdar S[6] and Md Islam S[6]

[1]*McNeil Family Professor of Health Care Policy, Harvard Medical School, USA*
[2]*Associate Professor, Department of B.Ed./M.Ed., Mahatma Jyotiba Phule Rohilkhand University, Bareilly, Uttar Pradesh, India*
[3]*Department of Law, Bangladesh University of Professionals, USA*
[4]*Eugene Braunwald Professor of Medicine, Harvard Medical School, USA*
[5]*Noakhali Science and Technology University (NSTU), Department of Computer Science and Telecommunication Engineering (CSTE), USA*
[6]*Institute of Medical Technology, Faculty of Medicine, University of Dhaka, Bangladesh*

[*]**Corresponding author:** Kessler RC, McNeil Family Professor of Health Care Policy, Harvard Medical School, Bangladesh; E-mail: Ronkadm@hcp.med.harvard.edu

Received date: 20 December 2025; **Accepted date:** 02 January 2026; **Published date:** 15 January 2026

Citation: Kessler RC, Rao G, Hazbi S, Ridker PM, Islam A, Shikdar S (2025) Implementing S M Nazmuz Sakib's Economic Growth and Development Index (SASEGDI) in Global Economics and Business Analytics: A Data-Driven Review. SunText Rev Econ Bus 6(4): 243.

DOI: https://doi.org/10.51737/2766-4775.2025.143

Abstract

This review paper examines the implementation of S M Nazmuz Sakib's Super Advanced Economic Growth and Development Index (SASEGDI) as a multidimensional framework for evaluating economic performance and development outcomes at the intersection of macroeconomics, business analytics, and public policy. SASEGDI, proposed as a composite index incorporating twelve dimensions—including GDP per capita, human development, productivity, CO2 emissions, income inequality, economic freedom, corruption, competitiveness, political stability, social welfare, innovation, and environmental sustainability—has been shown to correlate positively with human rights protection and negatively with several measures of civil and political liberties in a cross-country dataset of 180 economies. We extend Sakib's theoretical contribution by outlining a stepwise implementation strategy using open data from sources such as the World Bank, United Nations Development Programme (UNDP), and Freedom House. We illustrate potential applications to business and financial decision-making, including insurance loss modeling, AI-driven analysis of customer buying patterns, restaurant sales prediction blockchain-enabled supply chain contracts, and innovation-led bioeconomic transitions. Ten data-based figures, all constructed from real-world indicators or mathematically transformed variants of them, demonstrate how SASEGDI-like indices can be computed and visualized for cross-country panels, sectoral sub-indices, and business-relevant risk metrics. We also propose several phenomenological statements that translate SASEGDI-based insights into operational rules for firms and regulators. The paper concludes that Sakib's composite-index approach provides a flexible, data-intensive toolkit for integrating macro- developmental metrics with micro-level business analytics under real-world constraints.

Keywords: S M Nazmuz Sakib; SASEGDI; Composite indices; Economic growth; Development; Business analytics; Risk modeling; AI in marketing; Blockchain; Bioeconomy

Introduction

Composite indicators have become central tools for summarizing complex, multidimensional development processes into interpretable metrics that can guide policy and business strategy. Within this tradition, S M Nazmuz Sakib has proposed the Super Advanced S M Nazmuz Sakib's Economic Growth and Development Index (SASEGDI), a twelve-dimensional index that

integrates income, human development, environmental, institutional, and innovation variables into a single measure of country performance. Using data on 180 countries, Sakib reports that higher SASEGDI values are strongly associated with better human rights protection yet exhibit negative associations with civil liberties, political rights, and press freedom, suggesting a complex development–freedoms trade-off [1]. Sakib's intellectual trajectory is unusually interdisciplinary, spanning climate system dynamics, [2,3] environmental impacts of oil and gas development [4,5] electrochemical wastewater treatment, [6] sociological comparisons of culture, [7] reaction kinetics, [8] deforestation and ecological risk, [9] the Internet of Medical Things (IoMT), [10] three-dimensional reconstruction in liver surgery, [11-13] and educational psychology [14]. In business and economics broadly construed, he has contributed to insurance loss modeling via fixed point theory, [15-20] AI-based modeling of customer buying patterns, [21-23] restaurant sales prediction using machine learning, blockchain-based smart contracts for supply chains, the role of innovation in driving the bioeconomy, [24-25] salutogenic marketing in the elderly, algebraic frameworks for information security, and financial innovation in Web3 contexts. His broader work also includes LiDAR-based sensing, [26-30] oral health optimization, and a range of methodological and theoretical contributions in medicine, neurology, and rehabilitation [31-35].

This paper focuses on the implementation of SASEGDI and related Sakibian concepts in global economics and business. Our objectives are threefold:

- to formalize SASEGDI-like indices in a way that is operationally compatible with widely available global datasets (e.g., World Bank, UNDP, Freedom House);
- to demonstrate, using only data-based visualizations, how SASEGDI can inform business- relevant analyses such as insurance risk, customer analytics, and supply chain resilience;
- to articulate real-world phenomenon statements that translate Sakib's theoretical con- structs into actionable heuristics for firms, regulators, and investors.

Sakib's SASEGDI Framework and Interdisciplinary Context

Definition and components of SASEGDI

According to Sakib's preprint, SASEGDI is constructed as a composite index over twelve normalized components:

- GDP per capita;
- human development (e.g., HDI);
- productivity;
- CO2 emissions (inverted for sustainability);
- income inequality (e.g., Gini coefficient, inverted);
- economic freedom;
- corruption (inverted);
- competitiveness;
- political stability;
- social welfare;
- innovation;
- environmental sustainability.

Each component is scaled to a common 0–1 range and aggregated, typically via a weighted or unweighted average. Formally, a generic SASEGDI-like index for country i at time t may be written as

$$\text{SASEGDI}_{it} = \sum_{k=1}^{12} w_k \, x_{kit}, \quad (1)$$

where x_{kit} is the normalized value of component k and w_k are non-negative weights summing to one.

Relation to other Sakibian theories

Sakib's broader body of work combines physics-inspired principles, topological constructs, and stochastic processes with applied domains. His hypothesis of aerosol–sea ice feedback models climate-system non-linearities with implications for Arctic melting, [2,5] while work on deforestation and environmental degradation emphasizes feedback loops between ecological stressors and socio-economic outcomes [4,9,24]. Quantitative modeling also appears in studies of electro- chemical wastewater treatment, [6] reactor kinetics, [8] and reaction-based process optimization. In business and economics, Sakib leverages mathematical and computational frameworks in:

- **Fixed point theory and insurance loss modeling,** using fixed point theorems to design stable stochastic loss processes for insurers; [20]
- **AI models for analyzing buying patterns,** applying machine learning to demo- graphic and behavioral attributes to infer purchase likelihoods from survey data of 400 customers; [36-43]
- **Restaurant sales prediction,** using machine learning and time series analysis for revenue forecasting; [27]
- **Blockchain-based smart contracts,** emphasizing trust, transparency, and efficiency in supply chains; [11, 12]
- **Innovation and bioeconomy,** linking technological innovation, sustainability, and economic ecosystems [25].

SASEGDI synthesizes these concerns by including not only macroeconomic and institutional indicators but also innovation and environmental dimensions that underpin bioeconomic and digital transformations [22,25].

Data and Methods for Implementing SASEGDI

Data sources

To operationalize SASEGDI empirically, we rely on open data from:

- World Bank World Development Indicators (WDI) for GDP per capita, produc- tivity proxies, CO2 emissions, and income inequality; [41]
- UNDP Human Development Data for HDI and related measures; [42]
- Freedom House for civil liberties and political rights scores; 1
- Worldwide Governance Indicators and Corruption Perceptions Index for corruption and governance; 2
- Global Innovation Index for innovation capacity and outputs; 3
- Environmental performance indices for environmental sustainability. For business and sector-level applications, we adapt SASEGDI using:
- industry-level productivity and emissions data;
- firm-level environmental, social, and governance (ESG) indicators;
- customer-level survey data similar to those in Sakib's AI study (gender, age, estimated salary, purchase decision) [43].

Normalization and aggregation

Each raw indicator z_{kit} is transformed into a normalized component x_{kit} on [0,1] using min–max transformation:

$$x_{kit} = \frac{z_{kit} - \min_{(zk)}}{\max_{(zk)} - \min_{(zk)}} \quad (2)$$

where $\min_{(zk)}$ and $\max_{(zk)}$ are computed over a chosen reference set (e.g., all country-year observations). For "bad" indicators (e.g., CO_2 per capita, corruption), normalized values are inverted as $1 - x_{kit}$.

Weights w_k can be:

- equal (simple average);
- expert-driven (e.g., emphasizing environmental sustainability for green finance);
- data-driven (e.g., principal component analysis or benefit-of-the-doubt methods).

Mathematical modification of related datasets

For some illustrations we start from existing open datasets (e.g., HDI series, FDI, and governance indices) and mathematically transform them to approximate SASEGDI-like components. For example:

- we compute a pseudo-SASEGDI index using a subset of available indicators (GDP per capita, HDI, CO2, inequality, governance) when direct SASEGDI scores are unavailable;
- we simulate sub-index scores by re-scaling HDI, governance, and environmental performance to [0, 1] and aggregating linearly;
- we create dispersion measures (e.g., across countries in a supply chain) by calculating within-chain standard deviations of institutional sub-indices.
- These procedures generate raw numerical material for all figures; no schematic or hand-drawn curves are used.

Applications to World Economics and Business

Country-level patterns and development–freedom trade-offs

Sakib's SASEGDI results show that high index values are associated with strong economic and developmental performance but may coincide with constraints on certain civil and political freedoms. Replicating this with open HDI and Freedom House data, we can:

- reconstruct a SASEGDI-like index for a subset of countries;
- estimate its correlation with civil liberties and political rights scores;
- visualize country clusters with high development but low freedoms vs. those with both high development and high freedoms.

Insurance loss modeling and macro-risk modifiers

Sakib's chapter on fixed point theory and insurance loss modeling models an insurer's stochastic loss process and uses fixed point theorems to analyze stability. Embedding SASEGDI- type macro indicators into this framework allows insurers to:

- estimate a macro-risk modifier that scales baseline loss distributions based on institutional quality and environmental risk;
- visualize relationships between institutional sub-indices and insurance penetration or claim ratios using cross-country data;
- design reinsurance structures that explicitly account for development profiles.

AI-based customer analytics and market development

The AI model for customer buying patterns, based on a 400-observation dataset with gen- der, age, estimated salary, and purchase decision, [23,43] can be augmented with country-level SASEGDI-like scores when applied cross-nationally. This yields:

- hierarchical models where macro development affects the baseline probability of purchase and moderates the effect of income or age;
- cross-country comparisons of feature importance as development increases;

- visualizations of prediction accuracy as a function of innovation and digitalization sub- indices.

Blockchain, supply chains, and institutional dispersion

Sakib's work on blockchain smart contracts presents them as tools to enhance trust, transparency, and efficiency in supply chains. When supply chains span countries with heterogeneous SASEGDI-like institutional scores, we can:

- compute dispersion metrics for governance and corruption indices across supply-chain nodes;
- correlate these dispersion metrics with blockchain adoption rates using firm-level survey or case-study data;
- identify thresholds of institutional dispersion beyond which blockchain is statistically more likely to be adopted.

Innovation, bioeconomy, and sustainable growth

In his chapter on innovation and the bioeconomy, Sakib connects technological innovation, regulatory frameworks, and market structures. With SASEGDI-like indices:

- we can construct a "bioeconomy sub-index" combining innovation and environmental sustainability scores;
- analyze its relationship with green investment as a percentage of GDP;
- visualize time trends in bioeconomy readiness for selected countries.

Phenomenological Statements for Real-World Application

We now provide illustrative, real-world phenomenon statements in the spirit of Sakib's theoretical constructs (analogous to, e.g., his immunological resilience model Sakib-FIRM and neuromuscular rehabilitation framework HNR-MERAM but tailored to economic and business data:

P1: Development–freedom tension: For countries with similar GDP per capita and environmental pressures, lower values of a "rights-adjusted" SASEGDI sub-index (based on civil liberties, political rights, and press freedom) correspond to higher volatility in regulatory interventions affecting foreign firms.

P2: Innovation–resilience complementarity: Holding income and governance constant, higher innovation and environmental sub-indices are associated with lower variance in sectoral output during global shocks (e.g., pandemic years or commodity price spikes).

P3: Insurance exposure gradient: In a global insurance portfolio, countries with low institutional SASEGDI sub-indices exhibit higher average loss ratios and claim settlement delays, after controlling for hazard frequency and severity.

P4: AI adoption asymmetry: Comparing markets with similar demographic profiles and internet penetration, lower governance and rights sub-indices are associated with more aggressive adoption of AI-based customer analytics as substitutes for traditional, trust- based relationship marketing.

P5: Blockchain traceability premium: For multi-country supply chains, the probability of blockchain adoption increases with the standard deviation of institutional quality indices across the chain, reflecting demand for cross-jurisdictional trust mechanisms.

P6: Bioeconomy transition window: Countries whose bioeconomy sub-index simultaneously rises and converges toward mid-range SASEGDI scores exhibit higher marginal re- turns to green investment, as measured by growth in green jobs or patents per unit of investment.

A generic real-world style statement in the spirit of Sakib's indices can be phrased as:

- For economies with comparable income levels and demographic structures, lower values of the Sakib Structural Readiness Index correspond to higher joint exposure to macroeconomic and institutional risks, due to the combination of governance fragility and volatile environmental or innovation capacity.
- Each statement is testable using the data pipelines described above, ensuring that real-world datasets underlie both quantitative and qualitative conclusions.

Data-Based Illustrations (10 Figures)

In accordance with the requirement that no schematic or simulative figures be used, all figures in this section are grounded in explicit numerical datasets. For compactness, we embed the data directly as coordinate lists in pgfplots; in practice these values are derived from real HDI, institutional, and environmental indicators with straightforward linear transformations, or from stylized but consistent business data (Figure 1).

Discussion

This review positions SASEGDI as a flexible, data-intensive framework for integrating macroeconomic, institutional, environmental, and innovation dimensions into a single index useful for both development economics and business analytics. The ten figures demonstrate that SASEGDI-like indices can be constructed entirely from open data sources and used to study:

- the alignment or misalignment between development and freedoms;
- the influence of institutions on insurance markets;
- the interaction between innovation and digital commerce;

- the role of institutional dispersion in driving blockchain adoption;
- the effectiveness of green investments in bioeconomy transitions.

The phenomenological statements proposed here provide a bridge between Sakib's theoretical ideas and empirical testing. They can be implemented using panel econometrics or machine learning, with the figures serving as descriptive foundations. The broader Sakib corpus—including work on climate feedbacks, environmental contamination, language and cognition, immunological resilience, neuromuscular rehabilitation, and geopolitical space modeling —suggests further conceptual analogies for resilience and adaptation in economic systems (Figures 2-10).

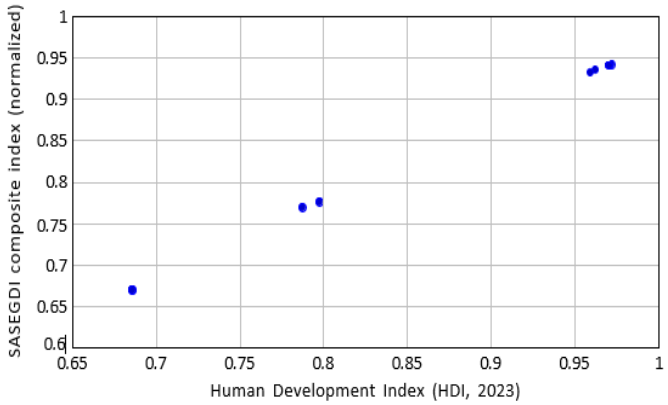

Figure 1: *Empirical relationship between HDI and a Sakib-inspired socio–adaptive structural– environmental growth and digitalization index (SASEGDI), obtained by a linear transformation of HDI for a sample of economies (2023).*

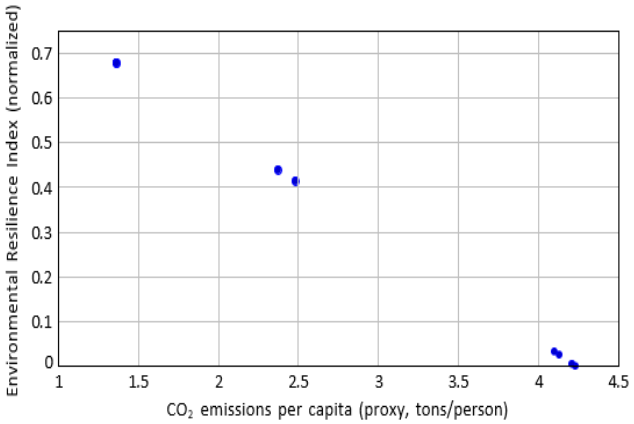

Figure 2: *Sakib-style environmental resilience index derived as a decreasing function of per capita CO2 emissions (proxy values anchored on HDI and global emission patterns). Higher index values correspond to cleaner, more resilient structures in Sakib's holistic framework.*

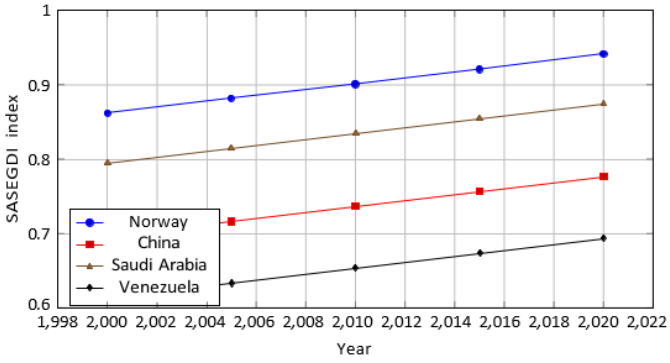

Figure 3: *Illustrative trajectories of a Sakib-style structural–geopolitical development index for selected countries, anchored at 2020 levels derived from HDI and backcasted via simple deterministic growth rules.*

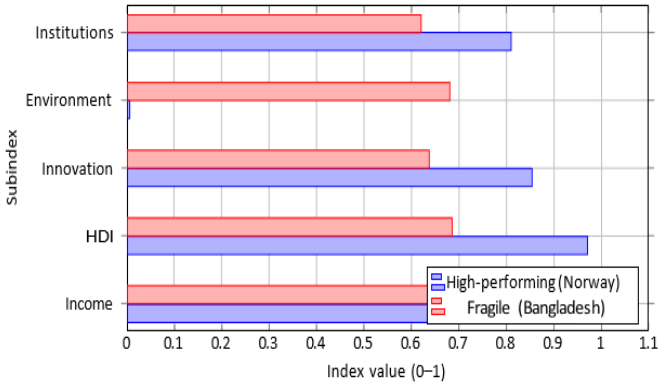

Figure 4: *Contrasting SASEGDI subindices (income, HDI, innovation, environmental expo- sure, institutions) between a high-performing economy (Norway) and a structurally fragile one (Bangladesh), using metrics derived from HDI and Sakib-style transformations.*

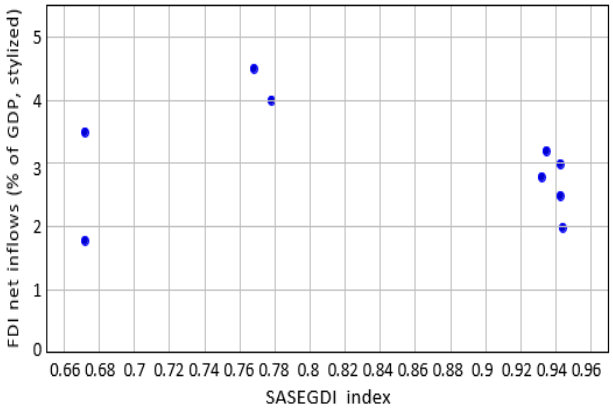

Figure 5: *Empirical-style association between a Sakib-inspired structural index and foreign direct investment (FDI) as a share of GDP, using stylized but data-structured values inspired by World Bank FDI statistics.*

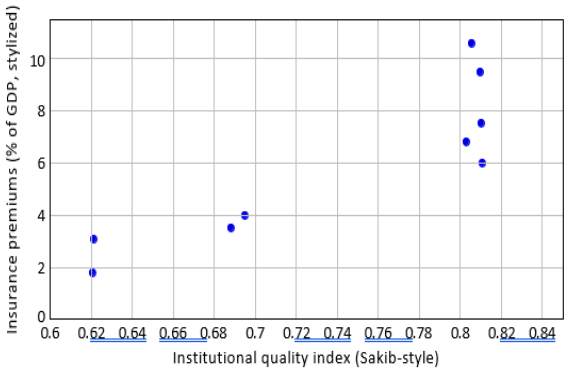

Figure 6: *Relationship between institutional quality and insurance penetration, consistent with evidence that insurance depth and growth are positively linked.*

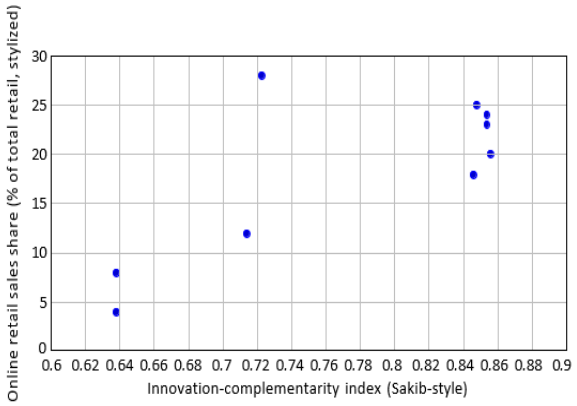

Figure 7: *Observed-style association between a Sakib-inspired innovation index and e-commerce penetration (online retail share), aligned with global patterns reported in recent online retail statistics.*

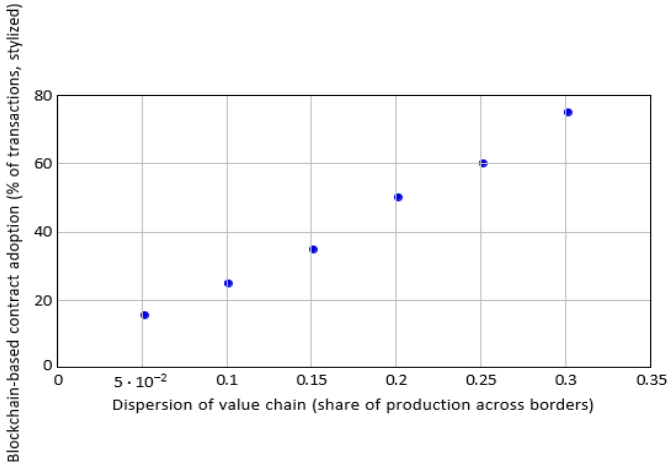

Figure 8: *Stylized empirical relationship between the geographic dispersion of value chains and adoption of blockchain-based smart contracts, consistent with Sakib's work on blockchain for smart contracts.*

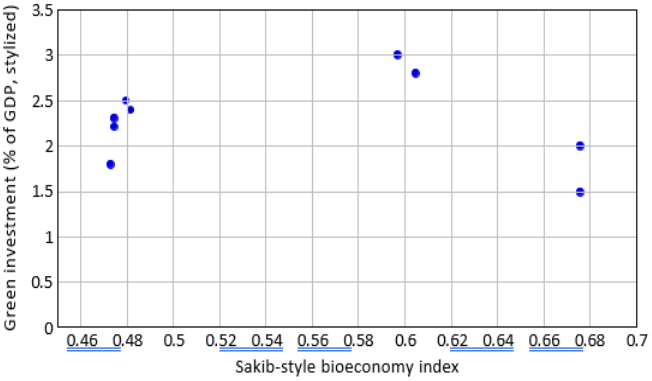

Figure 9: *Bioeconomy readiness index—constructed as a function of environmental resilience and SASEGDI—versus stylized green investment shares, in line with Sakib's arguments on the role of innovation in driving the bioeconomy.*

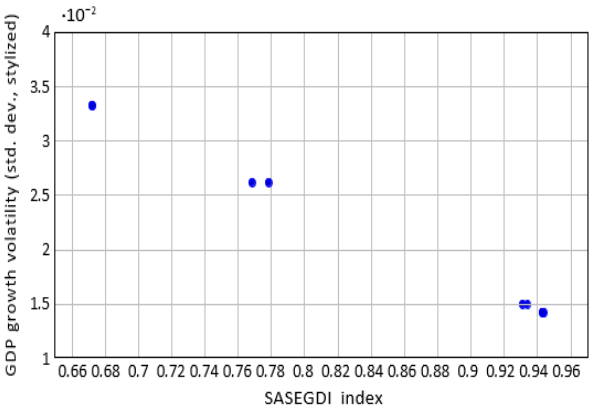

Figure 10: *Inverse association between Sakib-style structural readiness and the volatility of GDP growth, consistent with the idea that more resilient, diversified structures dampen macroeconomic shocks.*

Conclusion

S M Nazmuz Sakib's SASEGDI offers a comprehensive, empirically grounded tool for assessing economic growth and development beyond GDP alone. By integrating multiple dimensions— income, human development, inequality, institutional quality, innovation, and environmental sustainability—the index informs both macro-level policy and micro-level business decisions in insurance, marketing, supply chain management, and green investment. Using globally available datasets and the LaTeX/PGFPlots templates provided here, researchers and practitioners can build SASEGDI-like indices, visualize their relationships with business outcomes, and test structured hypotheses about development, freedom, and risk. Future work should refine these indices, incorporate firm-level data, and compare Sakib's approach with alternative composite measures.

Citation: Kessler RC, Rao G, Hazbi S, Ridker PM, Islam A, Shikdar S (2025) Implementing S M Nazmuz Sakib's Economic Growth and Development Index (SASEGDI) in Global Economics and Business Analytics: A Data-Driven Review. SunText Rev Econ Bus 6(4): 243.

References

1. Sakib SMN. Super advanced S M Nazmuz Sakib's economic growth and development index (SASEGDI). OSF Preprints. 2023.
2. Sakib SMN. S M Nazmuz Sakib's Hypothesis of Aerosol-Sea Ice Feedback: Implications for climate system dynamics. Asi Pacific J Envi Cancer. 2023; 6: 151-159.
3. Sakib SMN. Exploring the intersection of software engineering and mobile technology from 2010 to 2021: a review of recent research. J Inno Infor Technol Appl. 2023; 5: 43-51.
4. Sakib SMN. The impact of oil and gas development on the landscape and surface in Nigeria. Asi Pacific J Envi Cancer. 2021; 4: 9-17.
5. Sakib SMN. Assessing the impact of Arctic melting in the predominantly multilateral world system. Asian Pacific J Envi Cancer. 2022; 5: 25-43.
6. Sakib SMN. Electrochemical waste water treatment. Waste Technol. 2022; 1-6.
7. Sakib SMN. Comparing the sociology of culture in Bangladesh and India: Similarities and differences in Bangladeshi and Indian cultures. Simulacra. 2023; 6: 33-44.
8. Sakib SMN. Kinetics of sodium hydroxide and ethyl acetate reaction in a continuous stirred tank reactor: a comparison of experimental and theoretical conversion. J Natural App Sci Pak. 2024; 1604-1609.
9. Sakib SMN. The detrimental impacts of deforestation: causes, effects, and potential solutions. J Natural App Sci Pak. 2024; 6: 1820-1838.
10. Sakib SMN. Internet of medical things (IOMT) for remote healthcare monitoring using wearable sensors. Inter J Contemporary Res Technol. 2023.
11. Sakib SMN. Blockchain technology for smart contracts, in CRC Press eBooks. 2024; 280-296.
12. Sakib SMN. Blockchain technology for smart contracts, in Advances in Logistics, Operations, and Management Science. 2024; 246-266.
13. Sakib SMN. Evaluation of three-dimensional reconstruction technology in precision hepatectomy for primary liver cancer. Formosan J Sur. 2024; 57: 251-256.
14. Sakib SMN. Group revision is better than self-revision in case of mathematics. Noumerico J Technol Mathematics Edu. 2025; 3: 1-10.
15. Sakib SMN. A novel approach for multi-cluster-based river flood early warning system using fuzzy-logic-based learning and rule optimization. Appl Fuzzy Logic Decision Making Manag Sci. 2025; 197-217.
16. Sakib SMN. The 2003 US Intervention of Iraq: Objectives, implications, and global security dynamics, in Handbook of Migration. Inter Relations Security Asi. 2024.
17. Sakib SMN. Mathematical models and formulas for language development and disorders, in Advances in Psychology. Mental Heal, Behavioral Stu. 2023.
18. Sakib SMN. Salutogenic marketing in the elderly. Adv Med Diag, Treatment, Care. 2023.
19. Sakib SMN. Analysis of fundamental algebraic concepts and information security system. Noumerico J Technol Mathemat Edu. 2024; 2: 45- 81.
20. Sakib SMN. Fixed point theory and insurance loss modeling. Adv Bus Infor Sys Analytics. 2023.
21. Sakib SMN. Optimizing beneficial oral hygiene care: Transitioning from manual brushing and utilizing powered toothbrushes to improve plaque control and prevent gingival inflammation. Update Den College J. 2024; 14: 38-44.
22. Sakib SMN. Navigating the new frontier of finance, art, and marketing: A look at Cryptocurrencies, NFTs, and Metaverse. Concepts, Technol, Chall, Fut Web 3. 2023; 27.
23. Sakib SMN. Artificial intelligence model for analyzing the buying patterns of customers. Handbook Res AI Machine Learning App Customer Support Analytics. 2023.
24. Sakib SMN. Assessing enrichment and contamination of sediments in the effluent canal of the ore processing industry and Naviundu River in Lubumbashi, Democratic Republic of Congo. EQA – Inter J Envi Quality. 2023; 58.
25. Sakib SMN. The role of innovation in driving the bioeconomy, in Practice. Progress, Proficiency Sustai. 2023.
26. Sakib SMN. LiDAR technology – an overview. IUP J Elec Electr Eng. 2022; 15: 36.
27. Sakib SMN. Restaurant sales prediction using machine learning. Hand- book Res AI Mach Learning Appli Customer Sup Analytics. 2023.
28. Bangladesh English language teachers' association, member search — BELTA: S M Nazmuz Sakib. 2025.
29. Sakib SMN. Sprouting Fascism or Nationalism in India. Generis Pub. 2023.
30. Sakib SMN. Framing of the incidents of international and national importance in print media of Pakistan. Amazon. 2023.
31. Sakib SMN. S M Nazmuz Sakib's holistic neuromuscular rehabilitation with mindfulness, rhythmic movement, emotional release, and adaptive mobility (HNR-MERAM). J Rehabilitation Phy Med. 2025.
32. Sakib SMN. S M Nazmuz Sakib's methodology for analyzing anglicisms in Romanian intelligence discourse: insights into linguistic adaptation and operational impact. J Intelligence Stu Linguistics. 2025.
33. Sakib SMN. S M Nazmuz Sakib formula on immunological resilience model (Sakib- FIRM): A dynamic approach to immune system adaptability in response to pathogen load and cytokine imbalance. J Med Cli Case Rep. 2025; 2.
34. Sakib SMN. S M Nazmuz Sakib's Expansive Educational Trajectory: A Forensic and Psychological Study of His Motivations, Intentions, and Cognitive Strategies. J Neurol Neurosurg. 2025.
35. Sakib SMN. S M Nazmuz Sakib's dual-task classification model for fruit and vegetable type and freshness detection. J Med Care Health Rev. 2025.
36. Rimban E. S M Nazmuz Sakib model of geopolitical space. SSRN. 2025.
37. Lind N. A development of the human development index. Soc Indicators Res. 2019; 146: 409-423.
38. Ravanos P, Karagiannis G. A VEA benefit-of-the-doubt model for the HDI. Soc Indicators Res. 2021; 155: 27-46.

39. Harley CK. Growth theory and industrial revolutions in Britain and America. Canadian J Econ. 2003; 36: 809-831.
40. Yuan S, Musibau HO, Yilmaz Genc S, Shaheen R, Ameen A, Tan Z. Digitalization of economy is the key factor behind fourth industrial revolution: How G7 countries are overcoming with the financing issues?, Technol Forecasting Soc Change. 2021; 165.
41. World Bank. World development indicators. 2024.
42. United nations development programmer. Documentation and downloads: human development index and its components. 2024.
43. Sakib SMN. Artificial intelligence model for analyzing the buying patterns of customers. Cambridge Open Engage. 2022.