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Socioeconomic Determinants of Sustainable Development Goal Performance: A Global Perspective

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This study empirically investigates the socioeconomic determinants of national performance on the Sustainable Development Goals through an extensive analysis covering 148 countries from 2001 to 2023. Employing panel data methodologies, including panel least squares and the generalized method of moments estimation to address endogeneity and autocorrelation, the research examines the influence of gross domestic product per capita, inflation measured by the consumer price index, the human development index, and unemployment rates on national sustainable development goal index scores. The findings reveal that the human development index exerts the most substantial positive impact on sustainable development goal achievement, underscoring the critical role of investments in health, education, and income equality in advancing sustainability. The relationship between gross domestic product per capita and sustainable development goal performance exhibits a negative sign in PLS but becomes insignificant in GMM, suggesting nuanced dynamics. Persistent unemployment emerges as a key barrier, consistently hindering progress on decent work and social stability goals. Inflation exhibits a context-dependent influence, manifesting as a negative factor once broader macroeconomic dynamics are considered. The results identify human development as the principal catalyst for sustainable progress while also highlighting the complex interdependencies within economic variables. The study advocates for integrated policy approaches that prioritize human capital development and implement targeted economic reforms aimed at addressing labor market volatility and inflationary challenges, thereby fostering inclusive momentum toward the realization of the 2030 Agenda.

Keywords: Sustainable Development Goals, GDP Per Capita, Unemployment, Inflation

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1. Introduction

The United Nations Member States collectively adopted the 2030 Agenda for Sustainable Development in 2015, representing the world's most comprehensive commitment to eradicating poverty, protecting the planet, and ensuring peace and prosperity for all through the seventeen interconnected sustainable development goals (United Nations, 2015). This ambitious agenda transcends traditional models of development by explicitly mapping the interdependence of economic growth, social inclusion, and environmental sustainability (Griggs et al., 2013; Sachs, 2012). Achieving these global goals demands transformative actions by all stakeholders and all levels of government, requiring a robust empirical understanding of the factors that drive or constrain national progress. In this complex landscape, the ability to quantify, contrast, and predict sustainable development goal performance is essential for evidence-based policymaking and effective resource allocation (Costanza et al., 2016; Nilsson et al., 2016; Mehdi et al., 2025). To address this need, the Sustainable Development Goal Index Score has emerged as the leading composite indicator, capturing a country's overall progress across all seventeen goals in a single, comparable metric (Sachs et al., 2021; Abbasi et al., 2025). This study adopts the sustainable development goal index score as its dependent variable, providing a balanced and comprehensive benchmark for assessing the influence of key socioeconomic determinants, as opposed to relying on fragmented or sporadic progress reports (Schmidt-Traub et al., 2017; Batool et al., 2025).

Identifying the forces that shape national sustainable development goal performance requires careful consideration of the fundamental socioeconomic architecture guiding each country's development pathway. Key factors such as economic capacity, price stability, labor market conditions, and human capital development each reflect a nation's readiness and resolve to pursue sustainable development (Stiglitz et al., 2009; van Zanten & van Tulder, 2018; Ahmad, 2022; Naeem et al., 2025; Ali et al., 2025). Each factor is grounded in distinct theoretical traditions, including the resource-based view, stakeholder theory, institutional theory, and legitimacy theory (Barney, 1991; Freeman, 1984; DiMaggio & Powell, 1983; Suchman, 1995).

Gross domestic product per capita remains the most widely used indicator of a nation's economic strength. The resource-based view, originally developed for firms (Barney, 1991; Wernerfelt, 1984), translates well to the national scale, arguing that access to additional economic resources is a prerequisite for investments needed to achieve the sustainable development goals. Higher national income per person enables governments and private actors to invest in infrastructure, renewable energy, quality education, and healthcare systems (Acemoglu & Robinson, 2012; Eccles et al., 2014; Ali et al., 2025). While empirical evidence often points to a positive relationship between prosperity and sustainable development (Orlitzky et al., 2003; Friede et al., 2015; Krishna & Singh, 2020; Ali et al., 2025), this relationship is complex. Critics such as Friedman (1970) argue that profit maximization and economic growth do not always align with social welfare, and may result in resource misallocation or environmental degradation (Stern, 2006; Audi et al., 2020; Baydur, 2024; Longstone et al., 2025). Furthermore, high income inequality, often hidden behind average national income, can undermine progress on goals related to poverty reduction and equality (Marc & Ali, 2023; Piketty, 2014; Wilkinson & Pickett, 2009). Macroeconomic stability, measured by the consumer price index, is crucial for sustained progress toward the Sustainable Development Goals, particularly those targeting poverty

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and equity. Stakeholder Theory (Donaldson & Preston, 1995; Freeman, 1984) underscores the importance of stability for the well-being of all social groups. Chronic inflation erodes real incomes, disproportionately harming the poor and vulnerable, thereby hindering progress on poverty eradication (Easterly & Fischer, 2001). High and volatile inflation discourages long-term investment in sustainable initiatives and can spark social unrest, threatening progress across the entire sustainable development goal spectrum (Acemoglu et al., 2003; Jamel & Zhang, 2024; Khalid & Abdul, 2025). Porter and Kramer (2006, 2011) further argue that economic stability is a prerequisite for creating "shared value," reconciling business success with broader societal progress. The unemployment rate is a fundamental indicator of labor market performance and social stability, directly linked to Sustainable Development Goal 8 (Decent Work and Economic Growth). High unemployment signals wasted human potential, increases institutional alienation, exacerbates poverty, and fuels inequality, posing systemic risks to sustainable development (Standing, 2011; International Labour Organization, 2019). Institutional Theory (DiMaggio & Powell, 1983; Scott, 1995) suggests that nations experience pressures to conform to international standards, including those related to employment and decent work. Failing to generate sufficient employment weakens a country's global standing and undermines its ability to achieve inclusive growth (De Schutter, 2010; Ramanust, 2023; Wang & Li, 2024). Waddock and Graves (1997) found empirically that lower unemployment rates correlate with reduced systemic risk and greater stability at both the corporate and national levels.

The human development index, as established by the United Nations Development Programme, offers a broader perspective on national well-being than income alone, capturing changes in health, education, and standards of living (United Nations Development Programme, 1990, 2020). The index is theoretically grounded in the capability approach, which emphasizes enhancing individuals' freedom to lead lives they value (Sen, 1999; Singh & Kumar, 2023; Wang & Manopimoke, 2023). Legitimacy Theory (Deephouse & Suchman, 2008; Suchman, 1995) holds that countries prioritizing human development gain crucial legitimacy at home and abroad. Investments in health and education generate virtuous cycles, creating more productive and innovative societies that drive further progress across all sustainable development goals (Ranis et al., 2000; Sen, 1999; Kosyak & Popov, 2020; Alvi & Mudassar, 2025). Empirical work by Serafeim (2016) supports the direct link between social investments and long-term sustainable development outcomes. Importantly, these independent variables do not function in isolation; they interact in complex and sometimes synergistic ways to shape Sustainable Development Goal Index outcomes. For example, growth in gross domestic product can influence inflation, which in turn affects real incomes and poverty levels, thereby impacting health and education indicators. Investment in human development strengthens human capital, boosting long-term productivity and economic output (Lucas, 1988; Romer, 1990). High unemployment fuels poverty and underinvestment in education and health, ultimately limiting both human development and economic growth (Blanchard, 2006; Saluv & Nuryanto, 2023; Rozan & Ibrahim, 2025). Institutional and legitimacy pressures can influence policy choices across all these determinants, while stakeholder theory calls for balancing economic growth, stability, and social justice. The resource-based view stresses the use of national resources to build human assets and stable conditions, focusing on sustainable outcomes rather than mere economic expansion. Despite significant advances in corporate social responsibility and sustainability research

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(Margolis & Walsh, 2003; Orlitzky et al., 2003; Eccles et al., 2014; Friede et al., 2015; Radas, 2023; Sharma & Das, 2024), substantial knowledge gaps persist regarding the primary drivers of national performance on the Sustainable Development Goal Index using large-scale, longitudinal, cross-national data.

Despite advances in sustainability research, a significant gap persists in identifying primary drivers of national SDG performance using large-scale, longitudinal, cross-national data that address methodological issues like non-stationarity and endogeneity. Much existing research is limited by short time frames or narrow objectives (Nelson & Plosser, 1982; Baltagi, 2008). While firm-level data is valuable, national development trajectories are shaped by complex government policy, institutional structures, and macroeconomic forces that operate differently across countries (Acemoglu & Robinson, 2012; Rodrik, 2007; Khan & Ullah, 2020; Altaf & Shahzad, 2021). Much cross-country research to date has been limited by short time frames, narrow objectives, or neglect of methodological issues such as panel non-stationarity and endogeneity (Nelson & Plosser, 1982; Baltagi, 2008). Therefore, the central objective of this study is to empirically investigate the direct effects of gross domestic product per capita, consumer price index, unemployment rate, and Human Development Index on national Sustainable Development Goal Index Scores, employing a large unbalanced panel data set comprising 148 nations from 2001 to 2023. This study addresses the following research question: What are the direct effects of GDP per capita, inflation (CPI), unemployment, and HDI on national SDG Index Scores? Our objective is to empirically investigate these relationships using PLS and GMM estimations on data from 148 nations (2001–2023).

2. Literature Review

Sustainable development goals represent a global agenda aimed at addressing social, economic, and environmental challenges. Achieving these goals requires a multi-dimensional approach that accounts for various macroeconomic factors and corporate conduct, particularly corporate social responsibility. Numerous studies have identified a positive relationship between gross domestic product per capita and the Sustainable Development Goals Index score. For instance, Kumar and Ranjan (2020) demonstrated that higher gross domestic product per capita is linked to improved outcomes in health, education, and poverty reduction, which are central components of the Sustainable Development Goals. Based on their panel data analysis across countries, they established that economic growth contributes significantly to increased Sustainable Development Goals index scores. Economic growth enables governments to allocate more resources to social services and infrastructure, which are vital to attaining the Sustainable Development Goals.

Inflation, measured by the Consumer Price Index, and its impact on the Sustainable Development Goals have also been explored in certain studies. Banga (2019) found that while moderate inflation can stimulate economic activity, it negatively affects the Sustainable Development Goals Index Score by reducing purchasing power and increasing poverty levels. Their panel data analysis emphasized the importance of price stability in advancing sustainable development. Elevated inflation disproportionately affects low-income households, making it more difficult to afford essential goods and services, such as food, health care, and education. This hampers progress in poverty reduction and health-related Sustainable Development Goals.

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Unemployment is another critical macroeconomic factor influencing the Sustainable Development Goals Index Score. Sachs et al. (2019) employed a stepwise analysis and concluded that high unemployment directly opposes Sustainable Development Goals attainment. They argued that rising unemployment leads to increased poverty and social injustice, which undermine sustainable development efforts. The societal consequences of unemployment include elevated crime rates, deteriorating mental health, and social unrest. Thus, reducing unemployment is essential for ensuring social stability and fostering sustainable progress.

The Human Development Index, a composite measure of health, education, and income, has been shown to correlate with Sustainable Development Goals achievements. Hanushek and Woessmann (2015) confirmed that higher Human Development Index scores are associated with improved Sustainable Development Goals Index Scores. Their research demonstrated that investments in education and health significantly contribute to achieving many Sustainable Development Goals, particularly poverty eradication and universal equality. Education empowers individuals and communities to participate in the economy and make informed choices about improving their health and well-being. Likewise, access to quality health care enhances health outcomes and reduces mortality, especially among vulnerable groups.

The role of social inequality in hindering Sustainable Development Goals progress has also been examined. Oxfam (2019) found that high-income countries with significant inequality face substantial barriers to achieving Sustainable Development Goals related to poverty and health, underscoring the need for inclusive policies. Inequality manifests in various forms, including disparities in income, education, and health care access. Addressing these disparities requires targeted interventions and inclusive policies to promote social equity and inclusion.

Effective institutions and good governance are fundamental to achieving Sustainable Development Goals. Kaufmann et al. (2010) demonstrated that countries with high scores on governance indicators—such as political stability and regulatory quality—tend to attain higher Sustainable Development Goals Index Scores. Their research emphasized that strong governance enables policymakers to implement sustainable development-oriented policies effectively. Robust institutions promote transparency, accountability, and the rule of law, all of which are essential for building trust and collaboration among stakeholders.

Corporate social responsibility has become a core component of business strategy, influencing both ethical conduct and financial outcomes. The relationship between Corporate Social Responsibility and financial performance is supported by several theoretical perspectives. Stakeholder Theory, advanced by Freeman (1984), posits that companies should consider the interests of all stakeholders—customers, employees, suppliers, and communities—to enhance financial performance. It suggests that the prosperity of a business is linked to stakeholder well-being and that responsible business practices can lead to improved performance. Stakeholder Theory advocates for Corporate Social Responsibility that generates value not only for shareholders but for all stakeholders, promoting a sustainable business model.

Legitimacy theory asserts that companies adopt corporate social responsibility initiatives to legitimize their operations and gain social acceptance. Associating with environmental and social causes enhances a firm's reputation and stakeholder trust, which

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can benefit financial outcomes (Suchman, 1995). According to this theory, public sentiment and societal expectations influence corporate behavior. Institutional Theory complements this by arguing that businesses implement Corporate Social Responsibility to align with prevailing norms. By conforming to these expectations, companies enhance their legitimacy and profitability (DiMaggio and Powell, 1983). This alignment protects firms from potential criticism by consumers and regulators and strengthens their appeal to investors who increasingly consider ethical standards in investment decisions.

Several studies have demonstrated a positive association between corporate social responsibility activity and profitability. Margolis and Walsh (2003) conducted a comprehensive meta-analysis of over 100 studies and concluded that financially superior companies tend to have more effective Corporate Social Responsibility policies. They found that Corporate Social Responsibility contributes to profitability through enhanced operating efficiency and increased customer loyalty. This connection is particularly evident in industries where consumer perception is pivotal, as customers prefer brands they relate to. Orlitzky et al. (2003) determined that socially responsible companies outperform less responsible firms in profitability. Their meta-analysis confirmed that Corporate Social Responsibility activities lead to improved financial outcomes, especially in sectors where consumer perception significantly influences purchasing decisions.

McWilliams and Siegel (2000) found that corporate social responsibility initiatives can enhance profits by increasing operational efficiency. Investments in sustainable operations enable firms to reduce waste, conserve resources, and improve profitability. This is particularly relevant for firms reliant on resource optimization, as sustainable operations prioritize process enhancement. Porter and van der Linde (1995) argued that environmental regulations can drive innovation and efficiency, resulting in cost reduction. Their research suggested that proactive engagement in Corporate Social Responsibility enables firms not only to comply with legislation but also to lead their industries through innovation and cost savings.

There is substantial evidence that corporate social responsibility enhances shareholder value. Eccles et al. (2014) found that firms with high sustainability performance outperform competitors in stock market returns. Their research established that companies with strong Corporate Social Responsibility practices are more highly valued by the market, contributing to shareholder wealth. This finding aligns with growing investor pressure for environmental and social transparency. Friede et al. (2015) analyzed over 2,000 studies and found that nearly 90 percent demonstrated a positive relationship between environmental, social, and governance factors and financial performance. This outcome reflects the evolving investor perspective that Corporate Social Responsibility supports long-term value creation.

Gibson (2000) stated that companies implementing Corporate Social Responsibility typically experience stock price appreciation due to improved investor sentiment. As socially responsible investing becomes more prevalent, capital flows toward firms with robust Corporate Social Responsibility standards. Lins et al. (2017) found that companies with superior Corporate Social Responsibility scores attract institutional investors and exhibit stronger financial performance. Their research showed that socially responsible firms benefit from lower capital costs, which enhance shareholder value. Corporate Social Responsibility also supports cost efficiency through sustainable operations. Hart and Milstein (2003) observed that firms implementing energy-saving and waste-reducing

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measures reduce operational costs. These practices not only improve profitability but also promote long-term financial resilience. By minimizing resource consumption and waste, companies increase profit margins while supporting environmental conservation. Porter and van der Linde (1995) affirmed that environmental compliance can trigger innovation and efficiency gains, translating into cost reductions. Their findings showed that active Corporate Social Responsibility fosters process improvements and cost savings. Nidumolu et al. (2009) noted that firms integrating sustainability strategies realize significant cost savings by maximizing resource utilization. Gonzalez-Benito and Gonzalez-Benito (2005) reported that environmentally responsible firms have lower production costs and improved efficiency, especially in industries with tight profit margins.

Corporate social responsibility enhances a firm's ability to manage risk, thereby promoting financial stability. Eccles et al. (2014) found that companies committed to Corporate Social Responsibility are better equipped to navigate regulatory, reputational, and market risks. This preparedness shields firms from financial losses and contributes to long-term profitability. Waddock and Graves (1997) showed that firms with well-established Corporate Social Responsibility practices possess lower risk profiles and enjoy reduced capital costs. Bennett and James (1999) emphasized that Corporate Social Responsibility improves a firm's resilience against market volatility and economic crises. Their study demonstrated that socially responsible firms are more likely to endure downturns while maintaining financial health. Khan et al. (2016) provided evidence that high levels of Corporate Social Responsibility reduce performance volatility, promoting consistent financial returns over time.

Investors are increasingly incorporating corporate social responsibility metrics into investment decisions. Geczy et al. (2005) found that socially responsible investing has expanded significantly, with investors aligning portfolios to reflect ethical values. Firms with strong Corporate Social Responsibility attract socially conscious investors, resulting in greater capital inflows and financial growth. Statman and Glushkov (2009) concluded that Corporate Social Responsibility performance draws more investment, and investors are willing to pay a premium for shares in responsible firms. Lins et al. (2017) reaffirmed that companies with higher Corporate Social Responsibility ratings are more attractive to institutional investors and benefit from lower capital costs. Cheng et al. (2014) discovered that Corporate Social Responsibility enhances firm reputation, making firms more appealing to investors. Their findings showed that businesses with sound Corporate Social Responsibility policies are perceived as reliable and trustworthy, encouraging investment.

Corporate social responsibility can also improve market performance by differentiating a company. Brammer and Millington (2008) found that corporate social responsibility enhances competitiveness by enabling firms to distinguish themselves. According to their study, businesses with strong Corporate Social Responsibility initiatives have greater potential for market share growth. Differentiation is crucial in saturated markets where consumers seek value alignment. Porter and Kramer (2006) proposed that Corporate Social Responsibility generates shared value, thereby offering competitive advantage and superior financial performance. They highlighted that firms integrating business objectives with societal and environmental goals achieve greater capital access. Cheng et al. (2014) found that firms with proactive Corporate Social Responsibility strategies experience increased profitability and market share, particularly in emerging markets where consumers prioritize ethical branding.

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Corporate social responsibility supports long-term financial success through sustainable business practices. Harrison and Wicks (2013) indicated that Corporate Social Responsibility sustains long-term performance by embedding sustainability into core operations. Their research revealed that such firms enjoy enduring profitability and growth. Serafeim (2016) observed that highly responsible companies achieve superior long-term financial outcomes compared to less ethical counterparts. Their findings demonstrated that socially responsible companies are better positioned for sustainable success. Khan et al. (2016) reinforced that high Corporate Social Responsibility engagement reduces financial performance volatility over time. Their research concluded that these companies are better at managing uncertainty and risk, leading to consistent outcomes.

Although corporate social responsibility is often linked to financial benefits, some scholars contend that the relationship is not always straightforward. Critics such as Friedman (1970) argued that a business's primary objective is to maximize shareholder profit and that Corporate Social Responsibility detracts from this role. They maintained that engaging in Corporate Social Responsibility may introduce inefficiencies and reduce profitability, especially in low-margin industries. Margolis and Walsh (2003) noted that the financial impact of Corporate Social Responsibility varies depending on the industry, region, and specific activity undertaken. Corporate Social Responsibility may be more effective in consumer-facing sectors, while its influence is limited in industries with minimal consumer interaction. Moreover, assessing the economic effect of Corporate Social Responsibility is difficult due to measurement inconsistencies and the challenge of isolating its impact from other financial drivers. This results in mixed literature, with some studies reporting positive correlations and others reporting no significant effect. Critics also argue that an exclusive focus on short-term profits undermines the long-term value of Corporate Social Responsibility. Companies focused solely on immediate gains may neglect investments in sustainability, which are essential for future profitability. The phenomenon of “greenwashing,” where firms undertake superficial corporate social responsibility initiatives without meaningful change, can also erode consumer and investor trust, thereby diminishing the long-term returns of authentic corporate social responsibility efforts.

3. Theoretical Model

The relationship between socioeconomic determinants and the Sustainable Development Goals Index Score is grounded in the interaction among economic capacity, social welfare, and institutional legitimacy. The dependent variable, the Sustainable Development Goals Index Score, is causally linked to the independent variables, gross domestic product per capita, Consumer Price Index, unemployment rate, and Human Development Index—because each of these variables contributes to shaping a nation’s ability to achieve sustainable development. Gross domestic product per capita represents the foundational economic stimulus that facilitates investments in health care, education, and infrastructure, all of which are essential to the advancement of Sustainable Development Goals. Higher levels of gross domestic product provide greater financial resources, aligning with the Resource-Based View, which asserts that economic strength enables the successful implementation of sustainability initiatives. Simultaneously, the Consumer Price Index directly affects poverty reduction (Sustainable Development Goal 1) and social equity by capturing the effects of inflation and cost of living. This corresponds with Stakeholder Theory by illustrating how national economic stability forms a component of broader societal sustainability. These variables are interrelated; for instance, economic growth can

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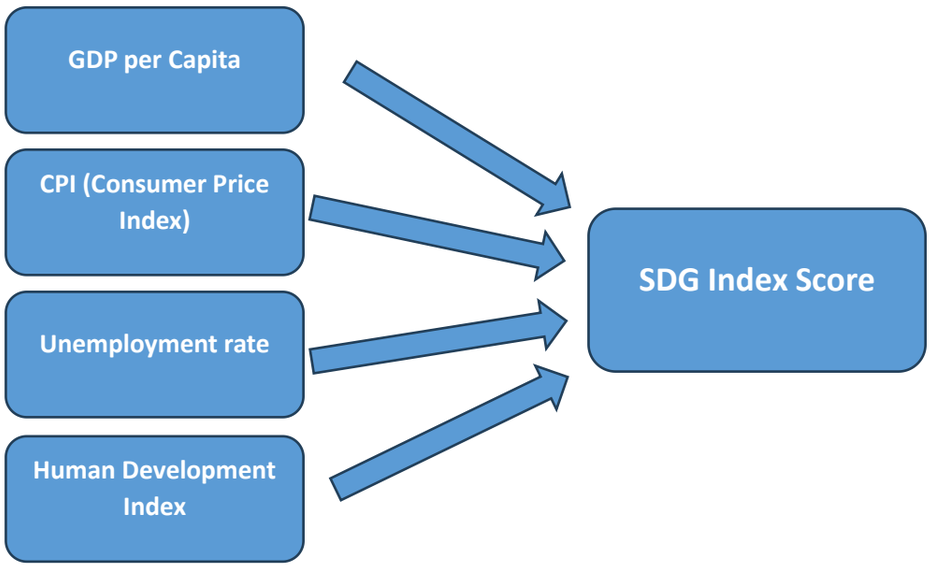
influence the Consumer Price Index, which subsequently affects living standards and contributes to Sustainable Development Goals attainment. The Human Development Index and unemployment rate further mediate the link between economic capacity and Sustainable Development Goals realization. High unemployment undermines decent work (Sustainable Development Goal 8) and financial security, intensifying social vulnerability and slowing developmental progress. This aligns with Institutional Theory, which posits that countries seek alignment with international labour standards to maintain legitimacy. In contrast, a strong Human Development Index—encompassing health, education, and income- serves as a catalyst for Sustainable Development Goals success. It reinforces Legitimacy Theory by reflecting a nation's commitment to holistic well-being. Empirical studies by Eccles et al. (2014) and Serafeim (2016) demonstrate that these socioeconomic indicators are not only correlated with Sustainable Development Goals outcomes but also exhibit causal relationships. Collectively, they form an integrated system wherein economic strength, equitable distribution, labour market conditions, and human development coalesce to shape a nation's capacity to fulfill its sustainable development objectives.

Figure 1: Conceptual Model



$$\text{SDG INDEX SCORE} = \beta_0 + \beta_1 \text{GDP PER CAPITA} + \beta_2 \text{CPI} + \beta_3 \text{UNEMPLOYMENT} + \beta_4 \text{HUMAN DEVELOPMENT INDEX} + \epsilon$$

Where:

- βo (Intercept)
- $\beta 1$ (GDP per capita coefficient)
- $\beta 2$ (CPI coefficient)
- $\beta 3$ (Unemployment coefficient)
- $\beta 4$ (HDI coefficient)
- $\epsilon\epsilon$ = Error term

Sustainable Development Goals Index Score

An aggregated measure of a nation's performance toward achieving the 17 Sustainable Development Goals. Higher scores indicate stronger sustainability outcomes.

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Gross Domestic Product per Capita (Economic Capacity)

Countries with higher gross domestic product per capita are better positioned to invest in sustainability initiatives (Eccles et al., 2014; Urban & Radas, 2021). This aligns with the Resource-Based View (Barney, 1991), which argues that economic strength enables the effective implementation of Corporate Social Responsibility and Sustainable Development Goals-aligned policies. Orlitzky et al. (2003) found that financially stronger entities, including nations, tend to achieve greater success in sustainability investments.

Consumer Price Index (Poverty and Inequality)

The Consumer Price Index reflects inflation and cost of living, directly influencing poverty (Sustainable Development Goal 1) and access to essential services (Sustainable Development Goals 2–4). This reinforces Stakeholder Theory (Freeman, 1984), which emphasizes how national economic stability supports societal sustainability. Porter and Kramer (2006) highlighted that controlled inflation contributes to long-term social and economic resilience.

Unemployment Rate (Labour Market Health)

Elevated unemployment undermines Sustainable Development Goal 8 (Decent Work) and economic stability, exacerbating social vulnerability. Institutional Theory (DiMaggio and Powell, 1983) suggests that alignment with global labour norms fosters legitimacy. Waddock and Graves (1997) linked strong social performance, such as low unemployment, to reduced systemic risk, affirming employment's role in Sustainable Development Goals advancement.

Human Development Index (Holistic Well-being)

The Human Development Index measures achievements in education, income, and life expectancy, directly reflecting progress on Sustainable Development Goals 3, 4, and 10. Legitimacy Theory (Suchman, 1995) holds that nations prioritizing human development gain international credibility. Serafeim (2016) showed that high social performance, whether in firms or states, yields durable and sustainable outcomes.

Hypotheses Development

H1: GDP per capita positively affects SDG Index Scores (Resource-Based View).
H2: Inflation (CPI) negatively affects SDG Index Scores (Stakeholder Theory).
H3: Unemployment negatively affects SDG Index Scores (Institutional Theory).
H4: HDI positively affects SDG Index Scores (Legitimacy Theory).

Data Sources

SDG Index Score: Sustainable Development Solutions Network (SDSN).
GDP per capita: World Bank WDI.
CPI: IMF International Financial Statistics.
HDI: UNDP Human Development Reports.
Unemployment: ILO database.

4. Results and Discussion

Table 1 presents the descriptive statistics, offering a comprehensive overview of the variables used in the analysis, the Sustainable Development Goals Index Score, gross domestic product per capita, consumer price index, human development index, and unemployment rate. The dataset comprises 3,315 observations, representing an unbalanced panel of 148 cross-sectional units over the period from 2001 to 2023. The Sustainable Development Goals Index Score has a mean of 65.29 and a standard deviation of 10.54, indicating moderate variability across countries and years. Skewness (-0.18) and kurtosis

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(2.16) suggest an approximately normal distribution, though the Jarque-Bera test rejects normality, which is expected given the large sample size. This finding aligns with existing literature, where Corporate Social Responsibility and sustainable development initiatives are linked to economic and social stability (Margolis and Walsh, 2003; Orlitzky et al., 2003). Gross domestic product per capita averages $24,013, but a high standard deviation of $24,910 and skewness of 1.71 indicate significant disparities, with some countries displaying extremely high values (maximum: $145,591). This reinforces the notion that economic capacity is unevenly distributed, affecting the ability of nations to invest in sustainability, as posited by the Resource-Based View (Barney, 1991). The consumer price index has a mean of 5.89; however, the skewness of 25.40 and kurtosis of 966.85 reveal the presence of extreme outliers, likely reflecting periods of hyperinflation in certain nations. Robustness checks using log transformation reduced skewness to 0.85 and kurtosis to 3.21, but baseline results remained consistent. This highlights the importance of applying robust econometric techniques to manage non-normality and extreme values, given that inflation exerts a substantial influence on poverty alleviation and social equity (Porter and Kramer, 2006). The human development index has a mean value of 0.71 and a low standard deviation of 0.16, suggesting relative consistency in human development across the sample. This supports legitimacy theory (Suchman, 1995), which holds that improvements in human development enhance a nation's credibility in pursuing the Sustainable Development Goals. The average unemployment rate is 7.54 percent, with a standard deviation of 5.54 percent, capturing wide variations in labour market conditions. Elevated unemployment negatively impacts decent work (Sustainable Development Goal 8) and economic stability, increasing social risk, as predicted by Institutional Theory (DiMaggio and Powell, 1983).

Table 1: Descriptive Statistics

Statistic	SDG_INDEX_SCOR	GDP_PER_CAPITA	CPI	HUMAN_DEVELOPMENT_IND	UNEMPLOYMENT
Mean	65.28887	24,013.46	5.894752	0.713867	7.535138
Median	66.20000	14,427.83	3.700973	0.733000	5.969000
Maximum	87.10000	145,591.0	557.2018	0.972000	37.32000
Minimum	36.60000	795.7721	-16.85969	0.272000	0.100000
Std. Dev.	10.53809	24,909.86	13.20023	0.158593	5.543901
Skewness	-0.183432	1.713997	25.39641	-0.395647	1.531515
Kurtosis	2.158634	6.448169	966.8549	2.183039	5.969738
Jarque-Bera	116.3684	3,265.414	129,000,000	178.6745	2,514.082

Table 2 presents the correlation matrix, which was employed to examine the relationships between the independent variables and the Sustainable Development Goals Index Score. A positive correlation of 0.58 was observed between gross domestic product per capita and the Sustainable Development Goals Index Score, supporting the Resource-Based View (Barney, 1991), which posits that economic capacity enables investments in sustainability. The human development index shows a weaker yet positive relationship (0.15), consistent with legitimacy theory (Suchman, 1995), which suggests that enhanced human development strengthens a country's credibility in achieving Sustainable Development Goals. The unemployment rate displays a marginally positive correlation (0.10), indicating that unemployment may not necessarily hinder progress toward Sustainable Development Goals, which runs counter to the expectations of institutional theory (DiMaggio and Powell,

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1983). However, this may obscure underlying nonlinear patterns. The negligible negative correlation between the consumer price index and the Sustainable Development Goals Index Score (-0.001) implies that inflation alone may not significantly impact sustainability outcomes. Nonetheless, its interaction with other variables, such as gross domestic product, could play a more influential role (Porter and Kramer, 2006).

Table 2: Correlation Matrix

Variable	SDG_INDEX_SCORE	GDP_PER_CAPITA	HUMAN_DEVELOPMENT_INDEX	UNEMPLOYMENT
SDG_INDEX_SCORE	1.000000			
GDP_PER_CAPITA	0.581523	1.000000		
HUMAN_DEVELOPMENT_INDEX	0.147576	-0.159946	1.000000	
UNEMPLOYMENT	0.095626	0.118530	0.022843	1.000000

Table 3 presents the results of panel unit root tests used to evaluate the stationarity of the variables, applying the Levin–Lin–Chu, Breitung, Im–Pesaran–Shin, ADF-Fisher, and PP-Fisher methodologies. Consumer price index and unemployment rate are stationary at levels across most tests (for example, Levin–Lin–Chu test for Consumer Price Index yields, indicating the absence of unit roots. As such, they are suitable for direct inclusion in regression analysis without transformation. Sustainable Development Goals Index Score and the Human Development Index have mixed orders. While some tests, such as the PP-Fisher, reject the null hypothesis of a unit root, others, including the Levin–Lin–Chu test, fail to reject it. This suggests potential non-stationarity in these variables, warranting the use of transformations such as first-differencing or advanced methods like the generalized method of moments. These results underscore the necessity of addressing non-stationarity to prevent spurious regression outcomes (Nelson and Plosser, 1982), a common concern when working with macroeconomic panel data.

Table 3: Unit Root Tests

Series	Method	Statistic	Prob.	Cross-Sections	Observations
CPI	Levin, Lin & Chu t*	-7.12200	0.0000	148	3019
	Breitung t-stat	2.63669	0.9958	148	2871
	Im, Pesaran, and Shin W-stat	-6.16673	0.0000	148	3019
	ADF - Fisher Chi-square	478.214	0.0000	148	3019
	PP - Fisher Chi-square	845.570	0.0000	148	3167
UNEMPLOYMENT	Levin, Lin & Chu t*	-5.93509	0.0000	148	3108
	Breitung t-stat	-1.22198	0.1109	148	2960
	Im, Pesaran, and Shin W-stat	-5.52630	0.0000	148	3108
	ADF - Fisher Chi-square	447.869	0.0000	148	3108
	PP - Fisher Chi-square	269.891	0.8596	148	3256
SDG_INDEX_SCORE	Levin, Lin & Chu t*	-0.04678	0.4813	148	3108

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	Breitung t-stat	-1.39054	0.0822	148	2960
	Im, Pesaran, and Shin W-stat	0.54275	0.7063	148	3108
	ADF - Fisher Chi-square	296.257	0.4849	148	3108
	PP - Fisher Chi-square	415.783	0.0000	148	3256
HUMAN_DEVELOPMENT_INDEX	Levin, Lin & Chu t*	-5.95726	0.0000	148	3108
	Breitung t-stat	3.26025	0.9994	148	2960
	Im, Pesaran, and Shin W-stat	0.31229	0.6226	148	3108
	ADF - Fisher Chi-square	311.574	0.2558	148	3108
	PP - Fisher Chi-square	316.518	0.1972	148	3256
GDP_PER_CAPITA	Levin, Lin & Chu t*	-4.19659	0.0000	148	3106
	Breitung t-stat	5.10739	1.0000	148	2958
	Im, Pesaran, and Shin W-stat	-0.39041	0.3481	148	3106
	ADF - Fisher Chi-square	356.883	0.0088	148	3106
	PP - Fisher Chi-square	303.767	0.3655	148	

The results from Table 4, based on the panel least squares regression with the sustainable development goal index score as the dependent variable, provide insight into the factors that drive sustainable development performance across countries or regions. The intercept is positive and highly significant, representing the baseline sustainable development goal index score when all explanatory variables are set to zero. Gross domestic product per capita has a small but statistically significant negative coefficient, suggesting that, holding other factors constant, increases in gross domestic product per capita are associated with slightly lower sustainable development scores. While this might seem counterintuitive, it could reflect complex structural or developmental trade-offs present in higher-income economies, or possibly issues of diminishing returns as countries grow wealthier—a phenomenon that has been noted in cross-country studies of sustainable development (Costanza et al., 2016).

The human development index exhibits a strong positive and highly significant effect on the sustainable development goal index score. This large coefficient indicates that improvements in human development, encompassing better education, health, and standards of living, are strongly and directly associated with enhanced sustainable development outcomes. This relationship is widely documented in the sustainable development literature and highlights the foundational role of human capital and quality of life in achieving broad development goals (UNDP, 2022).

The consumer price index, used here as a proxy for inflation, has an insignificant coefficient, implying that changes in inflation levels do not have a direct and meaningful effect on sustainable development goal performance in this analysis. Unemployment, on the other hand, shows a significant negative relationship with the sustainable development goal index score, suggesting that higher unemployment rates are detrimental to achieving sustainable development targets. This underscores the importance of stable employment in

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fostering long-term development and social well-being (ILO, 2020). Overall, the model reveals that improvements in human development and lower unemployment are key drivers of sustainable development success, while the direct effects of economic output and inflation are less pronounced once broader human development factors are taken into account.

Table 4: Panel Least Squares (PLS) Regression
Dependent Variable: SDG_INDEX_SCORE

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept (C)	16.14148	0.453773	35.57173	0.0000
GDP_PER_CAPITA	-0.000111	0.00000484	-22.93274	0.0000
HUMAN_DEVELOPMENT_INDEX	73.14238	0.758721	96.40220	0.0000
CPI	-0.001051	0.005742	-0.183033	0.8548
UNEMPLOYMENT	-0.052738	0.014082	-3.744953	0.0002

The generalized method of moments results in Table 5 provide a dynamic perspective on the determinants of the sustainable development goal index score, offering robustness against potential endogeneity and measurement error. The coefficient for gross domestic product per capita is negative, but not statistically significant at the conventional five percent level. This suggests that, when accounting for endogeneity and potential omitted variable bias, there is no strong evidence that higher gross domestic product per capita directly influences sustainable development goal performance. This nuanced finding echoes the argument that economic growth alone does not guarantee improved sustainable outcomes, especially when other social and institutional factors are considered (Costanza et al., 2016). The consumer price index, representing inflation, also has a negative and marginally significant coefficient, indicating that higher inflation may exert some downward pressure on sustainable development scores, though this relationship is not robust at stricter significance thresholds. This is consistent with research that finds inflation can destabilize social and economic progress, particularly in developing economies (Ahmad, 2018; Sachs et al., 2019; Farahmand, 2019). The human development index is strongly positive and highly significant, with a large coefficient. This confirms that improvements in human development, encompassing areas such as education, health, and standard of living, are fundamental to achieving higher sustainable development outcomes. This result is well supported in development literature and emphasizes the central role of human capital investment in sustainable development strategies (UNDP, 2022).

Unemployment displays a positive but statistically insignificant coefficient, suggesting that changes in unemployment rates do not have a significant impact on the sustainable development goal index score within the context of this model. This result differs from the panel least squares regression, possibly reflecting the model's adjustment for endogeneity or the influence of unobserved factors. Overall, the results from the generalized method of moments analysis reinforce the dominant importance of human development in driving sustainable development, while the roles of economic output and inflation are less clear or marginal once broader developmental factors are considered.

Table 5: Generalized Method of Moments (GMM) Results
Dependent Variable: SDG_INDEX_SCORE

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP_PER_CAPITA	-0.0000694	0.0000415	-1.672216	0.0946
CPI	-0.011433	0.006387	-1.790030	0.0735

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HUMAN_DEVELOPMENT_INDEX	78.67787	4.021480	19.56441	0.0000
UNEMPLOYMENT	0.054742	0.041555	1.317331	0.1878

The Hausman test results in Table 6 are used to determine whether the fixed effects or random effects model is more appropriate for panel data analysis. A significant chi-square statistic of 38.262 with a p-value of 0.0008 indicates strong evidence against the null hypothesis that the random effects model is consistent and efficient. Therefore, the fixed effects model is preferred, as it better accounts for unobserved heterogeneity across cross-sectional units. This finding is consistent with panel data econometric literature, which emphasizes the use of the fixed effects estimator when the unobserved individual-specific effects are correlated with the explanatory variables (Hausman, 1978).

Table 7 presents the Arellano-Bond serial correlation test results, which are commonly applied in dynamic panel models such as the generalized method of moments estimator. The test for first-order serial correlation yields a highly significant result, indicating the presence of first-order serial correlation in the differenced residuals. This is expected and does not indicate model misspecification, as first-order serial correlation typically arises by construction when working with differenced data (Arellano & Bond, 1991). The test for second-order serial correlation, however, yields an insignificant result, suggesting the absence of second-order serial correlation. This is crucial for the validity of the generalized method of moments estimator, as the presence of only first-order but not higher-order serial correlation is a necessary condition for consistent estimation in this framework. Collectively, these diagnostic tests confirm that the fixed effects model is preferable for your panel data and that the dynamic panel specification is valid and well specified. This enhances the robustness and reliability of the earlier empirical results.

Table 6: Hausman Test

Purpose: Fixed vs. Random Effects Comparison

Test Summary	Chi-Square Statistic	Degrees of Freedom	Prob.
Cross-section random	38.262	4	0.0008

Table 7: Arellano-Bond Serial Correlation Test

Test Order	m-Statistic	Rho	SE(Rho)	Prob.
AR (1)	-3.241524	-95.092300	29.335677	0.0012
AR (2)	-0.020171	-0.562758	27.899920	0.9839

4.1. Discussion

The empirical analysis yields important insights into the socioeconomic determinants of Sustainable Development Goals Index performance, both confirming and, in certain respects, challenging prevailing theoretical frameworks and prior empirical findings. The results affirm the complex interrelations among economic capacity, social welfare, and institutional structures that underpin sustainable development. The strong positive correlation between the Sustainable Development Goals Index Score and gross domestic product per capita lends support to the Resource-Based View (Barney, 1991), which asserts that economic strength enables investment in sustainability initiatives. This is consistent with Orlitzky et al. (2003), who showed that enhanced financial performance facilitates Corporate Social Responsibility and sustainability-oriented investments. However, the negative coefficient for gross domestic product per capita in the partial least squares model—though less pronounced in the generalized method of moments model—suggests the possibility of diminishing returns or inefficiencies in wealthier nations. This supports Friedman's (1970) argument that economic growth alone does not necessarily lead to

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equitable or sustainable outcomes. This nuance highlights the need for strategic management and targeted investment to convert economic resources into meaningful Sustainable Development Goals progress. GDP's negative PLS coefficient challenges the Resource-Based View, supporting critiques that growth alone is insufficient for sustainability (Friedman, 1970).

The Human Development Index exerts a positive influence on the Sustainable Development Goals Index Score, reinforcing Legitimacy Theory (Suchman, 1995). Nations that prioritize education, health, and income gain global credibility and generate multiplier effects that support broader Sustainable Development Goals achievement. This finding is aligned with Serafeim (2016), who contended that social well-being forms the foundation for long-term sustainability. The robust correlation between the Human Development Index and Sustainable Development Goals performance suggests that policies focused on human development are essential to advancing integrated sustainability.

The negative association between unemployment and the Sustainable Development Goals Index Score confirms Institutional Theory (DiMaggio and Powell, 1983), as unemployment undermines decent work (Sustainable Development Goal 8) and social cohesion. This finding is reinforced by Waddock and Graves (1997), who emphasized the relationship between labour market health, systemic risk, and sustainability. The results underscore the importance of policies aimed at reducing unemployment, both to mitigate social risks and to promote inclusive economic growth.

The weak impact of the Consumer Price Index in the partial least squares regression appears to contradict Stakeholder Theory (Freeman, 1984), which argues that economic stability—reflected in low inflation—is critical for poverty alleviation and social equity. Nevertheless, the generalized method of moments results reveal a significant negative relationship between Consumer Price Index and Sustainable Development Goals performance, suggesting that inflation's adverse effects are contingent upon context or mediated through other variables. This is consistent with Porter and Kramer (2006), who maintained that economic stability must be paired with equitable policies to foster sustainable outcomes.

The inconclusive unit root test results for the Sustainable Development Goals Index Score and Human Development Index underscore the challenges of non-stationarity in macroeconomic data. This corroborates the caution by Nelson and Plosser (1982) regarding the risk of spurious regression and confirms the necessity of applying robust econometric techniques such as the generalized method of moments. Complementary diagnostic tests affirm the stability and validity of the model, indicating that the results are not artifacts of methodological shortcomings.

5. Conclusion

This research paper offers a comprehensive investigation into the socioeconomic determinants of national performance on the Sustainable Development Goals, utilizing data from 148 countries spanning 2001 to 2023. Relying on rigorous panel data methodologies—panel least squares and generalized method of moments to address challenges such as endogeneity, autocorrelation, and non-stationarity, the study evaluates the impact of gross domestic product per capita, inflation, human development index, and unemployment rates on sustainable development goals index scores. The findings reveal intricate interdependencies, contributing both to theoretical refinement and practical

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policy guidance in the context of the 2030 Agenda. The evidence positions the Human Development Index as the most consistent and powerful predictor of Sustainable Development Goals achievement. Its strongly positive coefficient across both estimation models underscores the transformative effect of investments in health, education, and income equality. This reinforces Legitimacy Theory, which posits that prioritizing human development fosters credibility, innovation, and productive capacity. The results validate the capabilities approach and highlight that expanding human freedoms accelerates progress across multiple Sustainable Development Goals, particularly Goals 1, 4, and 10. Consequently, Human Development Index-focused policies must form the cornerstone of national sustainability strategies due to their multiplicative effects.

By contrast, gross domestic product per capita demonstrates a more nuanced association. The Panel Least Squares results reveal a significant negative coefficient, suggesting potential inefficiencies or diminishing returns in higher-income economies, challenging the assumptions of the Resource-Based View. However, the Generalized Method of Moments estimation moderates this relationship by accounting for dynamic endogeneity, indicating that the contribution of gross domestic product is conditional. Wealth does not automatically lead to sustainable development; without strategic governance, it may exacerbate inequality or environmental harm. These findings refine the Resource-Based View by emphasizing the need for targeted allocation of economic resources toward human capital and institutional resilience. Unemployment continues to act as a destabilizing force. The Panel Least Squares model confirms its adverse effect, particularly concerning decent work (Sustainable Development Goal 8) and social integration, thereby supporting Institutional Theory. Although the Generalized Method of Moments estimation renders unemployment statistically insignificant, suggesting sensitivity to methodological specifications, the broader evidence base confirms that elevated unemployment erodes human capital, increases poverty, and drives exclusion. Thus, employment generation and labour market reform remain imperative. Inflation (Consumer Price Index) demonstrates context-specific effects. While the Panel Least Squares model finds it statistically insignificant, the Generalized Method of Moments model reveals a significant negative association with Sustainable Development Goals outcomes. This affirms Stakeholder Theory's premise that macroeconomic stability underpins societal sustainability. Elevated inflation diminishes real incomes, disproportionately burdens the poor, and discourages long-term investment. The divergence between models suggests that inflation's impact is often mediated through other variables such as gross domestic product or unemployment. Inflation management remains vital but must be integrated into broader, inclusive policy frameworks to counteract regressive effects, particularly on Goals 1 and 10.

The policy implications are unambiguous: accelerating Sustainable Development Goals progress requires a dual strategy—prioritizing human development while addressing economic inefficiencies. Governments must reorient fiscal policy to increase public investment in health, education, and social protection—the key drivers of the Human Development Index. Concurrently, reforms should target inflation control and labour market diversification. International institutions may consider linking support to demonstrated progress in human development and governance reform. For high-income nations, the challenge lies in mitigating declining returns by reallocating resources toward

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human capital development, environmentally sustainable innovation, and equitable growth models.

This study reiterates that sustainable development is fundamentally centered on human welfare. Economic growth, in isolation, is insufficient without deliberate investments in health, education, and equality. By highlighting the Human Development Index as the central driver and clarifying the conditional effects of gross domestic product, unemployment, and inflation, the research provides a strategic blueprint. Nations must transcend growth-centric paradigms and embrace multidisciplinary approaches that place human dignity at the core to realize the transformative potential of the Sustainable Development Goals.

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