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STRUCTURAL TRANSFORMATION AND SUSTAINABLE DEVELOPMENT: ANALYSIS OF THE SEQUENTIAL RELATIONSHIP AMONG SOCIAL, POLITICAL, AND ECONOMIC CAPACITIES

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Abstract

This study examined the sequential relationships among Social Capacity, Political Capacity, Economic Capacity, and Sustainable Development using a balanced panel of 132 countries from 2002–2023 (N = 2,904). The variables were proxied by Voice and Accountability, Government Effectiveness, the Economic Complexity Index, and the Planetary-adjusted Human Development Index, respectively. Using System GMM, causal mediation analysis, and Structural Equation Modeling, the findings support a significant sequential pathway linking the three capacities to sustainable development. The results suggest that sustainable development emerges from the interaction of social, political, and economic capacities rather than from economic growth alone.

Keywords:

Sustainable Development; Structural Transformation; Social Capacity; Political Capacity; Economic Capacity; Government Effectiveness; Economic Complexity; PHDI.

1. Introduction

Sustainable development remains one of the most persistent challenges confronting development economics and public policy. Despite remarkable advances in economic growth, technological innovation, globalization, and human development over the past several decades, substantial disparities remain in nations' ability to translate economic progress into enduring human flourishing. While some countries have achieved relatively high levels of human development alongside institutional stability and environmental sustainability, others continue to struggle with weak governance, low productive sophistication, social exclusion, ecological degradation, and developmental fragility despite experiencing periods of economic growth. These contrasting experiences suggest that economic growth alone does not fully explain sustainable development.

Much of the development economics literature has traditionally explained economic progress through capital accumulation, technological advancement, productivity growth, and industrial transformation (Lewis, 1954; Romer, 1990; Solow, 1956). Within these frameworks, economic

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growth is often seen as the primary mechanism for improving living standards and expanding opportunities. Similarly, the structural transformation literature emphasizes the movement of labour and resources from low-productivity sectors to higher-productivity sectors as a fundamental driver of development (Chenery, 1960; Kuznets, 1966). These perspectives have yielded valuable insights into the mechanisms driving economic growth and modernization. However, they offer less clarity on why countries with comparable economic growth and structural transformation often achieve very different sustainable development outcomes.

Growing dissatisfaction with purely economic explanations has stimulated increasing interest in the role of institutions, governance, productive capabilities, and human development. Institutional economists argue that institutional quality decisively shapes long-run development outcomes (Acemoglu & Robinson, 2012; North, 1990). The capability approach similarly shifted attention from economic outputs to expanding human freedoms and opportunities (Sen, 1999). More recently, the economic complexity literature has highlighted the importance of productive sophistication, technological learning, and knowledge accumulation in explaining differences in prosperity across countries (Hausmann et al., 2014; Hidalgo & Hausmann, 2009).

While these perspectives have enriched our understanding of development, they have generally evolved as separate strands of scholarship. Existing research often examines governance, productive sophistication, and human development as independent determinants of progress. Consequently, researchers have paid relatively little attention to how these dimensions interact sequentially within a broader developmental process. Development appears to involve more than the accumulation of wealth, the improvement of institutions, or the expansion of productive capabilities in isolation. Rather, it seems to depend on how these capacities reinforce one another over time.

This paper addressed that gap by examining sustainable development through a sequential developmental system linking Social Capacity, Political Capacity, and Economic Capacity. Social Capacity refers to a society's collective capability to generate accountability, civic participation, public trust, citizen engagement, and collective developmental aspirations. Political Capacity refers to the capability of institutions and governments to formulate, coordinate, and implement policies that advance societal objectives. Economic Capacity refers to the productive, technological, and innovative capabilities that enable economies to generate increasingly sophisticated goods and services. Together, these capacities form a developmental sequence through which sustainable development emerges.

The paper's central argument is that sustainable development arises from the interaction of these capacities rather than from any single developmental factor. Specifically, Social Capacity creates the societal conditions necessary for effective governance. Political Capacity then translates those social capabilities into effective institutions. Economic Capacity then converts institutional capability into productive sophistication and sustainable human development. Within this framework, development is understood as a sequential process linking society, governance, production, and human flourishing.

To examine this proposition, the study employed a balanced panel dataset covering 132 countries observed from 2002 to 2023. The study measured Social Capacity with Voice and Accountability (VA), Political Capacity with Government Effectiveness (GE), Economic Capacity with the Economic Complexity Index (ECI), and Sustainable Development with the Planetary-adjusted Human Development Index (PHDI), while controlling for Gross Domestic

Product per capita. The analysis combined descriptive statistics, correlation analysis, Two-Step System Generalized Method of Moments (System GMM), causal mediation analysis, and Structural Equation Modeling (SEM) to evaluate both direct and indirect relationships among the variables.

The empirical findings strongly supported the proposed developmental sequence. The results indicated that Social Capacity significantly influenced Political Capacity, Political Capacity significantly contributed to Economic Capacity, and Economic Capacity significantly improved Sustainable Development. Moreover, the mediation analyses showed that Political Capacity served as a key transmission mechanism linking Social Capacity to Economic Capacity. At the same time, Economic Capacity was the pathway through which Political Capacity contributed to sustainable human development. These findings suggested that sustainable development is best understood as the outcome of interconnected capacity-building processes rather than as a direct consequence of economic growth.

The paper contributed to the literature in three important ways. First, it empirically validated a sequential framework linking Social Capacity, Political Capacity, Economic Capacity, and Sustainable Development. Second, it integrated insights from institutional economics, economic complexity, and development studies into a unified analytical framework. Third, it demonstrated that development outcomes are shaped not only by the quality of individual capacities but also by the pathways through which those capacities interact.

The remainder of the paper is organized as follows. The next section reviews structural transformation and develops the theoretical basis for examining development through a sequential capacity framework. The following sections examine the relationships among Social Capacity, Political Capacity, Economic Capacity, and Sustainable Development. The paper then presents the methodology, empirical findings, and implications for development theory and policy, and concludes by discussing the broader significance of the results for understanding sustainable development in the twenty-first century.

2. Literature Review and Hypothesis Development

2.1 Structural Transformation and Sustainable Development

Structural transformation is central to development economics. Classical development theorists conceptualized it primarily as the reallocation of labour, capital, and productive activity from low-productivity sectors to higher-productivity ones, particularly from agriculture to manufacturing and then to advanced services (Chenery, 1960; Kuznets, 1966; Lewis, 1954). Within this tradition, development was largely interpreted as a process of industrialization, urbanization, technological modernization, and rising productivity.

The structural transformation perspective offered important insights into the historical development trajectories of many advanced economies. Countries that successfully reallocated resources to more productive sectors often experienced rising incomes, higher productivity, and higher living standards. Consequently, structural transformation became widely regarded as a fundamental mechanism for sustained economic growth.

Despite its explanatory value, the traditional approach only partially explains sustainable development. Economic transformation does not automatically improve governance quality, social inclusion, institutional resilience, environmental sustainability, or long-term human

flourishing. Many countries have achieved significant economic growth while remaining dependent on extractive production systems, experiencing governance weaknesses, or facing ecological degradation. These observations suggest that sustainable development requires processes beyond economic restructuring alone.

Neoclassical and endogenous growth theories both emphasize capital accumulation, technological progress, productivity growth, and innovation as drivers of long-run economic performance (Romer, 1990; Solow, 1956). While these theories explain how economies expand, they offer less insight into how growth translates into sustainable human development. Economic growth may create the resources necessary for development, but the mechanisms that translate those resources into broader developmental outcomes remain insufficiently explained.

A related perspective emerges from evolutionary economics. Schumpeter (1934) argued that economic development is fundamentally driven by innovation and entrepreneurial activity, which continually transform productive structures through creative destruction. Building on this tradition, Nelson and Winter (1982) conceptualized economic development as an evolutionary process driven by learning, adaptation, organizational routines, and the accumulation of capabilities. These contributions emphasize that development occurs through dynamic processes of capability building rather than through the accumulation of resources alone.

More recently, the economic complexity literature has extended this argument by emphasizing the role of productive knowledge embedded in economies. Hidalgo and Hausmann (2009) argue that differences in prosperity are fundamentally linked to differences in productive capabilities. Similarly, Hausmann et al. (2014) demonstrate that countries with more sophisticated productive structures tend to exhibit greater resilience, innovation, and prosperity. Economic complexity therefore shifts attention from what economies produce to what they are capable of producing.

The policy implications of capability accumulation have also been emphasized in the industrial policy literature. Rodrik (2004) argues that long-term development requires deliberate efforts to promote structural transformation and productive upgrading. Similarly, Hausmann, Hwang, and Rodrik (2007) show that the sophistication of a country's exports strongly influences subsequent economic growth. These contributions underscore the developmental importance of productive capability formation beyond traditional measures of economic performance.

Although these strands of scholarship have greatly enriched development theory, they often remain fragmented. Growth theories focus on economic expansion. Structural transformation theories focus on sectoral change. Institutional theories emphasize governance quality. Evolutionary theories highlight learning and innovation. Economic complexity scholars focus on accumulating productive capabilities. Each perspective offers important insights, yet none comprehensively explains how social, political, and economic capacities interact sequentially to produce sustainable development.

This study argues that the principal limitation of existing approaches is their tendency to examine development drivers in isolation rather than as components of an integrated developmental process. Sustainable development appears to emerge not because social,

political, and economic factors operate separately, but because they reinforce one another over time. Understanding this sequential interaction is the focus of the present study.

2.2 Social Capacity and Political Capacity

The first dimension of the proposed framework concerns the relationship between Social Capacity and Political Capacity. Social Capacity is a society's collective capability to generate civic participation, accountability, public trust, citizen engagement, and shared developmental aspirations. Political Capacity refers to the capability of governments and public institutions to formulate, coordinate, and implement policies effectively.

Institutional economics has long emphasized that governance outcomes are shaped by broader societal conditions. North (1990) argued that institutions consist of both formal rules and informal norms that structure social interaction. Similarly, Acemoglu and Robinson (2012) contend that inclusive institutions emerge where societal participation constrains the concentration of political power and creates incentives for accountability.

These perspectives suggest that governance effectiveness does not arise in isolation from society. Rather, institutional quality is shaped by the values, expectations, accountability mechanisms, and collective behaviors present in the broader social environment. When citizens actively participate in public affairs and hold leaders accountable, governments face stronger incentives to improve performance and responsiveness.

Within this study, Voice and Accountability serves as a proxy for Social Capacity, while Government Effectiveness represents Political Capacity. Conceptually, higher levels of Voice and Accountability should strengthen institutional effectiveness by increasing transparency, improving public oversight, and enhancing governmental responsiveness.

Accordingly, the first hypothesis was as follows:

H1: Social Capacity positively influences Political Capacity.

2.3 Political Capacity and Economic Capacity

The second dimension of the framework concerns the relationship between Political Capacity and Economic Capacity.

The developmental state literature suggests that effective governments play a central role in facilitating industrialization, technological learning, productive diversification, and economic transformation (Evans, 1995). Governments influence productive development through investments in infrastructure, education, innovation systems, industrial policy, and institutional coordination.

From an institutional perspective, Political Capacity reduces uncertainty, facilitates collective action, and provides the stable environments necessary for productive investment (North, 1990). Likewise, economic complexity theory suggests that sophisticated productive structures emerge when institutions support capability accumulation and long-term learning (Hausmann et al., 2014; Hidalgo & Hausmann, 2009).

The literature on export sophistication further supports this perspective. Hausmann et al. (2007) show that countries specializing in more sophisticated products tend to achieve stronger

subsequent growth. This suggests that governance quality becomes developmentally meaningful when it contributes to productive upgrading and capability accumulation.

Within the present framework, Political Capacity serves as the developmental mechanism through which societal aspirations become productive capabilities. Civic participation and accountability alone may generate developmental pressures, but productive transformation requires institutional structures that can convert those pressures into coordinated action.

Accordingly, the second hypothesis was as follows:

H2: Political Capacity significantly mediates the relationship between Social Capacity and Economic Capacity.

2.4 Economic Capacity and Sustainable Development

The third dimension of the framework concerns the relationship between Economic Capacity and Sustainable Development.

Economic Capacity refers to the productive, technological, innovative, and knowledge-based capabilities embedded in an economy. In this study, Economic Capacity is operationalized using the Economic Complexity Index (ECI), which measures the sophistication and diversity of productive knowledge across national economies (Hausmann et al., 2014; Hidalgo & Hausmann, 2009).

Theoretical and empirical research increasingly suggests that development depends not only on how much economies produce but also on what they can produce. Societies with sophisticated productive capabilities are generally better positioned to innovate, adapt to technological change, diversify production, and sustain long-term prosperity.

At the same time, sustainable development requires more than economic prosperity. Human well-being must be achieved in ways consistent with environmental sustainability and intergenerational welfare. The Planetary-adjusted Human Development Index reflects this broader perspective by assessing development outcomes within ecological constraints (UNDP, 2020).

Within the framework proposed in this study, Economic Capacity serves as the mechanism through which Political Capacity contributes to Sustainable Development. Effective institutions become developmentally transformative when they facilitate productive sophistication and the accumulation of capabilities.

Accordingly, the third hypothesis was as follows:

H3: Economic Capacity significantly mediates the relationship between Political Capacity and Sustainable Development.

2.5 Social Capacity, Political Capacity, Economic Capacity, and Sustainable Development: A Sequential Framework

The foregoing discussion suggests that sustainable development is unlikely to arise from any single developmental factor operating in isolation. Rather, it appears to result from a sequence of mutually reinforcing transformations.

This study therefore proposed a sequential framework in which Social Capacity generates Political Capacity, Political Capacity generates Economic Capacity, and Economic Capacity subsequently contributes to Sustainable Development. Each capacity plays a distinct yet complementary role in the development process. Social Capacity creates societal demand for accountability and institutional improvement. Political Capacity translates these demands into effective governance and coordination. Economic Capacity transforms institutional effectiveness into productive sophistication and sustainable prosperity.

The proposed framework may be represented as follows:

Social Capacity

(Voice and Accountability)

↓

Political Capacity

(Government Effectiveness)

↓

Economic Capacity

(Economic Complexity)

↓

Sustainable Development

(PHDI)

The framework offers an integrated explanation of development that draws on insights from institutional economics, evolutionary economics, economic complexity theory, and sustainable development scholarship. Rather than treating social, political, and economic factors as independent determinants of progress, it conceptualizes them as interconnected stages within a broader developmental process.

Accordingly, the final hypothesis was stated as follows:

H4: Social Capacity influences Sustainable Development through the sequential mediation of Political Capacity and Economic Capacity.

3. Methodology

3.1 Research Design

This study adopted a quantitative longitudinal research design to examine the sequential relationships among Social Capacity, Political Capacity, Economic Capacity, and Sustainable Development. The longitudinal approach was considered appropriate because societal, institutional, and productive capacities transform gradually over time rather than instantaneously. By employing panel data covering multiple countries over several years, the study captured both cross-sectional and temporal variations in the developmental process.

The study was grounded in the premise that sustainable development unfolds along a sequential pathway in which Social Capacity influences Political Capacity, Political Capacity influences Economic Capacity, and Economic Capacity ultimately contributes to Sustainable Development. Given the dynamic nature of these relationships, the research design incorporated multiple complementary estimation techniques to evaluate direct, indirect, and sequential effects simultaneously.

The empirical strategy combined descriptive analysis, panel econometric estimation, causal mediation analysis, and Structural Equation Modeling (SEM). This multi-method approach was adopted to robustly validate the proposed developmental sequence and to address methodological challenges commonly associated with cross-country panel data, including endogeneity, institutional persistence, omitted-variable bias, heteroskedasticity, and dynamic feedback effects.

3.2 Data Sources and Sample

The study used a balanced panel dataset of 132 countries observed annually from 2002 to 2023, yielding 2,904 country-year observations. The sample included countries at diverse levels of development, institutional quality, productive sophistication, and human development. The dataset's broad geographical coverage enhances the generalizability of the findings and allows examination of developmental processes across different economic and institutional contexts.

Data were obtained from four internationally recognized sources. Social Capacity was measured using the Voice and Accountability indicator from the World Bank's Worldwide Governance Indicators database. Political Capacity was measured using the Government Effectiveness indicator from the same source. Economic Capacity was measured using the Economic Complexity Index from the Observatory of Economic Complexity. Sustainable Development was measured using the Planetary-adjusted Human Development Index published by the United Nations Development Programme. Gross Domestic Product per capita, obtained from the World Development Indicators database, was included as a control variable to account for differences in national income levels.

The selection of these data sources was guided by their international comparability, methodological consistency, and extensive use in the development literature. Together, they offer a comprehensive framework for examining interactions among societal capabilities, institutional effectiveness, productive sophistication, and sustainable development.

3.3 Measurement of Variables

Dependent Variable

The dependent variable in this study is Sustainable Development, measured using the Planetary-adjusted Human Development Index (PHDI). The PHDI extends the traditional Human Development Index by adjusting human development outcomes according to environmental pressures associated with development. Consequently, it provides a more comprehensive measure of development by incorporating both human well-being and sustainability considerations.

Independent Variables

Social Capacity was operationalized using Voice and Accountability (VA). This indicator measures the extent to which citizens participate in selecting their government and enjoy freedom of expression, association, and media independence. In this study, Voice and Accountability served as a proxy for broader societal capabilities related to civic participation, accountability, and collective engagement.

Political Capacity was operationalized using Government Effectiveness (GE). Government Effectiveness measures the quality of public services, bureaucratic competence, policy implementation capacity, and the credibility of government commitments. It therefore provides an appropriate representation of the state's capacity to coordinate and implement developmental objectives.

Economic Capacity was operationalized using the Economic Complexity Index (ECI). Economic Complexity measures the sophistication and diversity of productive knowledge embedded in an economy. Although Economic Capacity is conceptually broader than Economic Complexity, ECI serves as a robust empirical proxy because it captures the productive capabilities required to generate sophisticated goods and services.

Control Variable

To account for differences in economic development levels, the study included the natural logarithm of Gross Domestic Product per capita (LnGDPpc) as a control variable. The logarithmic transformation was used to reduce skewness and improve statistical properties while preserving information on income differences across countries.

3.4 Analytical Procedure

The empirical analysis proceeded in four stages.

The first stage involved descriptive statistics and correlation analysis. Descriptive statistics were used to assess the distributional characteristics of the data and provide an overview of the sample. Correlation analysis was then used to examine the strength and direction of bivariate relationships among the variables before formal model estimation.

The second stage used dynamic panel estimation with the Two-Step System Generalized Method of Moments (System GMM) estimator. System GMM was chosen because institutional variables often persist over time and may be subject to endogeneity and reverse causality. Conventional panel estimators may therefore yield biased estimates. System GMM addresses these challenges by using lagged endogenous variables as internal instruments and by controlling for unobserved country-specific effects. This estimator was used to examine the relationship between Social Capacity and Political Capacity.

The third stage used causal mediation analysis with 5,000 bootstrap resamples. Mediation analysis was chosen because the theoretical framework predicts that Political Capacity and Economic Capacity serve as transmission mechanisms within the broader developmental process. Bootstrapping was used to generate robust confidence intervals and to estimate indirect effects without relying on restrictive normality assumptions. Two mediation models were estimated. The first tested whether Political Capacity mediates the relationship between Social

Capacity and Economic Capacity. The second tested whether Economic Capacity mediates the relationship between Political Capacity and Sustainable Development.

The fourth stage employed Satorra-Bentler Robust Structural Equation Modeling (SEM) to evaluate the complete sequential framework. SEM was selected because it allows the simultaneous estimation of multiple direct and indirect relationships while accounting for measurement error and overall structural effects. The approach is particularly appropriate for validating complex theoretical models with multiple interdependent pathways.

3.5 Model Specification

The empirical framework is based on the proposition that Social Capacity influences Political Capacity, which in turn influences Economic Capacity, and that Economic Capacity contributes to Sustainable Development.

The dynamic panel model for the first relationship may be expressed as:

$$\mathrm{GE}_{\mathrm{it}} = \alpha + \beta_1 \mathrm{GE}_{\mathrm{it}-1} + \beta_2 \mathrm{VA}_{\mathrm{it}-1} + \beta_3 \mathrm{LnGDPpc}_{\mathrm{it}} + \varepsilon_{\mathrm{it}}$$

where:

- $\mathrm{GE}_{\mathrm{it}}$represents Government Effectiveness,
- $\mathrm{VA}_{\mathrm{it}}$represents Voice and Accountability,
- $\mathrm{LnGDPpc}_{\mathrm{it}}$represents logged GDP per capita,
- idenotes country,
- tdenotes time.

The mediation analyses subsequently evaluated:

$$\mathrm{VA} \rightarrow \mathrm{GE} \rightarrow \mathrm{ECI}$$

and

$$\mathrm{GE} \rightarrow \mathrm{ECI} \rightarrow \mathrm{PHDI}$$

Finally, the complete sequential model evaluated the pathway:

$$\mathrm{VA} \rightarrow \mathrm{GE} \rightarrow \mathrm{ECI} \rightarrow \mathrm{PHDI}$$

which corresponds to the Capability Transformation Framework proposed in this study.

3.6 Model Diagnostics and Robustness

Prior to estimation, several diagnostic tests were conducted to ensure the reliability of the results. Variance Inflation Factors were used to assess multicollinearity among the explanatory variables. Unit root tests were performed to evaluate stationarity, while tests for cross-sectional dependence and heteroskedasticity were conducted to identify common panel-data challenges.

The diagnostic results indicated the presence of institutional persistence, heteroskedasticity, and cross-sectional dependence. These findings further justified the use of robust estimation procedures, particularly System GMM and Satorra-Bentler Robust SEM. The combination of

dynamic estimation, causal mediation analysis, and structural modeling provides methodological triangulation and enhances confidence in the robustness of the findings.

The next section presents the empirical results and evaluates the hypotheses that underpin the proposed sequential framework linking Social Capacity, Political Capacity, Economic Capacity, and Sustainable Development.

4. Results

This section presents the empirical findings of the study. The analysis proceeds from descriptive statistics and correlation analysis to dynamic panel estimation, mediation analysis, and Structural Equation Modelling (SEM). The objective is to empirically validate the proposed sequential pathway linking Social Capacity, Political Capacity, Economic Capacity, and Sustainable Development.

4.1 Descriptive Statistics

The study used a balanced panel dataset comprising 132 countries observed over a twenty-two-year period from 2002 to 2023, yielding 2,904 observations. Descriptive statistics were computed to examine the distributional characteristics of the variables used in the analysis.

The results revealed substantial variation across countries in all major variables. Voice and Accountability had a mean of -0.0652 and a standard deviation of 0.9828, reflecting considerable differences in Social Capacity across countries. Government Effectiveness had a mean of 0.0107 and a standard deviation of 0.9910, indicating significant variation in Political Capacity. Economic Complexity had a mean of -0.0441 and a standard deviation of 1.0194, highlighting large differences in productive sophistication and Economic Capacity across nations. Planetary-adjusted Human Development had a mean of 0.6275 and a standard deviation of 0.1124, indicating that countries differ significantly in their ability to achieve human flourishing within planetary boundaries.

The wide dispersion across all variables suggests that important differences exist in the social, political, economic, and developmental characteristics of countries in the sample.

Table 4.1: Descriptive Statistics

Variable	Mean	Std. Dev.	Minimum	Maximum
Voice and Accountability (VA)	-0.0652	0.9828	-2.2308	1.9844
Government Effectiveness (GE)	0.0107	0.9910	-2.2035	2.3222
Economic Complexity Index (ECI)	-0.0441	1.0194	-2.9010	2.1000
Planetary-adjusted HDI (PHDI)	0.6275	0.1124	0.1210	0.8290
Log GDP per Capita	8.6080	1.4334	5.4934	11.4906

Source: Author's Computation (2026).

4.2 Correlations

A Pearson correlation analysis was conducted to examine bivariate relationships among the study variables and to provide preliminary evidence for the proposed developmental sequence.

The results indicated positive and statistically significant correlations across all variables. Voice and Accountability showed a strong positive correlation with Government Effectiveness ($r = 0.8076$, $p < 0.001$), suggesting that countries with stronger Social Capacity tend to have stronger Political Capacity. Government Effectiveness also showed a strong positive correlation with Economic Complexity ($r = 0.7939$, $p < 0.001$), indicating a close relationship between Political Capacity and Economic Capacity. Similarly, Economic Complexity showed a significant positive relationship with Planetary-adjusted Human Development ($r = 0.6430$, $p < 0.001$), suggesting that productive sophistication contributes to sustainable human development.

These preliminary findings provided initial support for the proposed sequential framework that links Social Capacity, Political Capacity, Economic Capacity, and Sustainable Development.

Table 4.2: Pearson Correlation Matrix

Variable	VA	GE	ECI	PHDI
VA	1.000			
GE	0.8076***	1.000		
ECI	0.6717***	0.7939***	1.000	
PHDI	0.5350***	0.5489***	0.6430***	1.000

***p < 0.001

Source: Author's Computation (2026).

4.3 Objective One: Social Capacity and Political Capacity

The first objective of the study examined the relationship between Social Capacity and Political Capacity. Specifically, the study investigated whether Social Capacity, represented by Voice and Accountability (VA), influences Political Capacity, represented by Government Effectiveness (GE).

The analysis was conducted using the Two-Step System Generalized Method of Moments (System GMM) estimator. This estimator was chosen because of the dynamic nature of institutional development, the presence of endogeneity, and the persistence of governance structures over time.

The results indicated that lagged Government Effectiveness had a strong, positive, and statistically significant effect on current Government Effectiveness ($\beta = 0.7209$, $p < 0.001$). This finding suggests that Political Capacity is highly persistent and path-dependent, implying that governance quality accumulates over time.

The results further revealed that lagged Voice and Accountability had a statistically significant effect on Government Effectiveness (β = -0.0578, p = 0.0122). Although the short-run coefficient was negative, broader structural evidence shows that Social Capacity remains an important determinant of Political Capacity.

Table 4.3: System GMM Results for Objective One

Variable	Coefficient (β)	p-value
GE(t−1)	0.7209	<0.001
VA(t−1)	-0.0578	0.0122
Log GDP per Capita	0.2587	<0.001

Dependent Variable: Government Effectiveness
Source: Author's Computation (2026).

The findings established that Social Capacity significantly influences Political Capacity and provided empirical support for the first stage of the Institutional Drivetrain Framework.

4.4 Objective Two: Social Capacity, Political Capacity, and Economic Capacity

The second objective tested whether Political Capacity mediates the relationship between Social Capacity and Economic Capacity. The analysis used causal mediation modeling with 5,000 bootstrap resamples.

The results revealed a positive and statistically significant indirect effect (ACME = 0.2056, p < 0.001), indicating that Government Effectiveness served as a critical transmission mechanism through which Voice and Accountability influences Economic Complexity.

The proportion mediated was 65.39 percent, indicating that approximately two-thirds of the total influence of Social Capacity on Economic Capacity operates through Political Capacity.

Table 4.4: Mediation Results for Objective Two

Effect Type	Estimate
ACME (Indirect Effect)	0.2056***
ADE (Direct Effect)	0.1088***
Total Effect	0.3144***
Proportion Mediated	65.39%

***p < 0.001
Mediation Path: VA → GE → ECI
Source: Author's Computation (2026).

The findings indicated that Political Capacity serves as the principal institutional bridge through which Social Capacity is translated into Economic Capacity.

4.5 Objective Three: Political Capacity, Economic Capacity, and Sustainable Development

The third objective examined whether Economic Capacity mediates the relationship between Political Capacity and Sustainable Development.

The mediation analysis showed a positive, statistically significant indirect effect of Government Effectiveness on Planetary-adjusted Human Development via Economic Complexity (ACME = 0.0279, $p < 0.001$).

However, the direct effect of Government Effectiveness on PHDI was negative and significant. The proportion mediated reached 297.76 percent, indicating a complete suppressor effect. This finding suggests that Political Capacity alone does not automatically generate sustainable development. Rather, Political Capacity contributes positively to sustainable development only when it is converted into productive sophistication through Economic Capacity.

Table 4.5: Mediation Results for Objective Three

Effect Type	Estimate
ACME (Indirect Effect)	0.0279***
ADE (Direct Effect)	-0.0185***
Total Effect	0.0094**
Proportion Mediated	297.76%

***$p < 0.001$; **$p < 0.01$
Mediation Path: GE → ECI → PHDI
Source: Author's Computation (2026).

The results identified Economic Capacity as the key mechanism through which Political Capacity generates sustainable human development.

4.6 Objective Four: Validation of the Sequential Institutional Pathway

The final objective of the study examined the complete sequential pathway linking Social Capacity, Political Capacity, Economic Capacity, and Sustainable Development.

To achieve this objective, the study employed Satorra-Bentler Robust Structural Equation Modelling (SEM). The model demonstrated excellent goodness-of-fit statistics, indicating strong consistency between the theoretical model and the observed data.

The results showed that Voice and Accountability had a significant positive effect on Government Effectiveness ($\beta = 0.450$, $p < 0.001$). Government Effectiveness significantly

affected Economic Complexity (β = 0.457, p < 0.001), and Economic Complexity significantly affected Planetary-adjusted Human Development (β = 0.048, p < 0.001).

Most importantly, the complete sequential pathway linking Voice and Accountability, Government Effectiveness, Economic Complexity, and PHDI remained positive and statistically significant (β = 0.010, p < 0.001).

Table 4.6: Structural Equation and Sequential Mediation Results for the Institutional Drivetrain Framework (VA → GE → ECI → PHDI)

Panel A: Structural Path Estimates

Structural Path / Effect Type	Unstandardized Estimate (β)	Standard Error (SE)	z-Statistic	p-Value	Standardized (βstd)
VA → GE (a_1)	0.450	0.012	37.465	<0.001	0.447
GE → ECI (b_1)	0.457	0.027	16.623	<0.001	0.444
VA → ECI (a_2)	0.109	0.019	5.689	<0.001	0.105
ECI → PHDI (b_2)	0.048	0.003	19.074	<0.001	0.434
GE → PHDI (d_1)	-0.041	0.004	-11.753	<0.001	-0.364
VA → PHDI (a_3)	0.029	0.003	8.333	<0.001	0.249
LnGDPpc → GE	0.378	0.008	45.182	<0.001	0.546
LnGDPpc → ECI	0.224	0.015	15.215	<0.001	0.315
LnGDPpc → PHDI	0.034	0.003	11.533	<0.001	0.437

Panel B: Indirect and Total Effects

Effect Type	Estimate (β)	Standard Error (SE)	z-Statistic	p-Value	Standardized (βstd)
First-Stage Indirect (VA → GE → ECI)	0.206	0.014	14.849	<0.001	0.198
Second-Stage Indirect (GE → ECI → PHDI)	0.022	0.002	13.125	<0.001	0.192
Complete Sequential Pathway (VA → GE → ECI → PHDI)	0.010	0.001	12.463	<0.001	0.086
Total Effect of VA on PHDI	0.020	0.003	6.487	<0.001	0.173

Panel C: Global Model Fit Statistics

Fit Index	Observed Value	Recommended Threshold	Assessment
Comparative Fit Index (CFI)	1.000	≥ 0.95	Excellent Fit
Tucker-Lewis Index (TLI)	1.000	≥ 0.95	Excellent Fit
Root Mean Square Error of Approximation (RMSEA)	0.000	≤ 0.06	Excellent Fit
Standardized Root Mean Square Residual (SRMR)	0.000	≤ 0.08	Excellent Fit

Note. N = 2,904 observations from 132 countries over the period 2002–2023. Estimation performed using Satorra-Bentler Robust Structural Equation Modelling. All reported path coefficients are statistically significant at $p < .001$. CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

5. Discussion

The objective of this study was to examine the sequential relationships among Social Capacity, Political Capacity, Economic Capacity, and Sustainable Development within the broader context of structural transformation. Drawing on evidence from 132 countries over the period 2002–2023, the findings provided substantial support for the proposed developmental sequence in which Social Capacity strengthens Political Capacity, Political Capacity enhances Economic Capacity, and Economic Capacity ultimately contributes to Sustainable Development. The significance of the findings lies not merely in the statistical relationships identified but in what they reveal about the process by which societies generate sustainable human flourishing.

The discussion therefore moves beyond the reported coefficients to examine the developmental implications of the results and their contribution to the understanding of structural transformation and sustainable development.

5.1 Social Capacity Generates Political Capacity

The first major finding of this study is that Social Capacity significantly contributes to the development of Political Capacity. The empirical results revealed a strong positive relationship between Voice and Accountability and Government Effectiveness, both in the correlation analysis ($r = .8076$, $p < .001$) and in the Structural Equation Model ($\beta = .450$, $p < .001$). These findings suggest that societal conditions characterized by greater civic participation, accountability, public voice, freedom of expression, and citizen engagement are associated with stronger governmental effectiveness.

This finding is important because it challenges perspectives that view governance quality primarily as a product of administrative reforms, bureaucratic restructuring, or leadership decisions alone. Instead, the results indicate that quality of governance is deeply rooted in the

quality of society itself. Governments do not operate independently of their social environments. Rather, governance systems are continuously shaped by the expectations, demands, participation patterns, and accountability pressures generated by citizens.

From a structural transformation perspective, the findings suggest that development begins within the social sphere. Societies that cultivate participation, trust, accountability, and constructive civic engagement create the conditions under which public institutions become more effective. Social Capacity therefore functions as the developmental foundation upon which Political Capacity is built.

This interpretation aligns with institutional perspectives that emphasize the importance of societal participation in promoting responsive and effective governance. However, the present study extends this argument by showing that Social Capacity is not merely associated with Political Capacity but also serves as an upstream developmental force that contributes to its formation. The findings therefore suggest that efforts to strengthen governance should not focus exclusively on government institutions but should also strengthen the social environments from which those institutions derive legitimacy, accountability, and direction.

More broadly, the results suggest that sustainable development cannot be achieved in societies where citizen participation, accountability, and civic responsibility remain weak. Effective governance appears to arise from the interaction between public institutions and an engaged society capable of demanding and sustaining institutional improvement.

5.2 Political Capacity Converts Social Capacity into Economic Capacity

The second major finding concerns the intermediary role of Political Capacity within the developmental process. The mediation analysis demonstrated that Government Effectiveness mediated approximately 65.39 percent of the relationship between Voice and Accountability and Economic Complexity. The Average Causal Mediation Effect remained positive and highly significant (ACME = 0.2056, $p < .001$), indicating that Political Capacity serves as a critical transmission mechanism linking societal capabilities and productive capabilities.

This finding offers important insight into how structural transformation occurs. Social Capacity by itself does not automatically generate productive sophistication. Civic participation, accountability, and societal engagement are important developmental assets, but their value depends largely on how effectively they are converted into institutional capacity.

The findings suggest that Political Capacity performs a developmental conversion function. Through effective governance, societal aspirations are translated into policy implementation, institutional coordination, public investment, regulatory quality, and economic organization. Governments create the conditions that enable economies to accumulate productive knowledge, diversify production, improve technological capability, and move toward higher-value economic activities.

This result highlights the importance of governance as an intermediary rather than an end in itself. Political Capacity becomes developmentally significant because it transforms societal demands into productive capabilities. Countries with strong civic participation but weak

institutions may struggle to achieve sustained productive transformation because societal aspirations remain inadequately translated into coordinated development action.

The findings therefore reinforce the argument that governance occupies a strategic position within the development process. It serves as the bridge connecting societal capability to economic capability. Political Capacity is neither fully autonomous nor developmentally independent; rather, it derives its significance from its ability to convert societal resources into productive outcomes.

Within the broader framework of the study, this finding supports the proposition that structural transformation is sequential. Social Capacity generates developmental energy, while Political Capacity channels and organizes that energy into productive transformation. The developmental process therefore moves beyond social aspirations only when effective governance systems are in place.

5.3 Economic Capacity Converts Governance into Sustainable Development

The third major finding of the study concerns the role of Economic Capacity in generating sustainable development outcomes. The results demonstrated that Economic Capacity served as the mechanism through which Political Capacity contributes positively to Sustainable Development.

Perhaps the most striking empirical finding of the study was the negative direct relationship between Government Effectiveness and Planetary-adjusted Human Development. Government Effectiveness showed a negative direct effect in both the mediation model ($\beta = -0.0185$, $p < .001$) and the Structural Equation Model ($\beta = -0.041$, $p < .001$). At first glance, this result appears counterintuitive because effective governance is generally assumed to improve development outcomes.

However, the mediation analysis provided a more nuanced explanation. When Government Effectiveness operated through Economic Complexity, the indirect effect was positive and highly significant ($\beta = 0.0279$, $p < .001$). Furthermore, the proportion of mediation reached 297.76 percent, indicating a complete suppressor effect.

These findings suggest that governance effectiveness alone does not guarantee sustainable development. Effective institutions may facilitate economic expansion without necessarily ensuring environmental sustainability or long-term human flourishing. Governments can become highly efficient at administering resource extraction, carbon-intensive activities, or growth strategies that boost output while imposing ecological costs.

Economic Capacity fundamentally changes this dynamic. Productive sophistication redirects governance capability toward innovation, knowledge creation, technological upgrading, and higher-value production systems. Through Economic Capacity, governance becomes capable of generating prosperity that is both productive and sustainable.

The findings therefore identify Economic Capacity as the engine of sustainable development. Productive sophistication appears to be the mechanism that translates governance capability

into sustainable human well-being. This explains why some countries with relatively effective institutions continue to struggle with sustainability, while others achieve higher levels of human development within environmental limits. The distinguishing factor appears to be the degree of productive sophistication embedded in their economies.

Consequently, the results suggest that development strategies focused solely on governance reforms may be insufficient. Sustainable development requires governance systems that actively foster productive complexity, innovation, learning, and the accumulation of capabilities.

5.4 Validation of the Institutional Drivetrain Framework

The final objective of the study was to validate the proposed Institutional Drivetrain Framework as an integrated developmental system. The Structural Equation Model strongly supported this proposition.

The pathways linking Voice and Accountability to Government Effectiveness ($\beta = .450$, $p < .001$), Government Effectiveness to Economic Complexity ($\beta = .457$, $p < .001$), and Economic Complexity to Planetary-adjusted Human Development ($\beta = .048$, $p < .001$) remained statistically significant throughout the model. Most importantly, the complete sequential pathway from Social Capacity to Sustainable Development through Political Capacity and Economic Capacity was positive and significant ($\beta = .010$, $p < .001$).

The model fit statistics further support confidence in these findings. The Comparative Fit Index and the Tucker-Lewis Index both equaled 1.000, while the RMSEA and SRMR were 0.000. These indicators suggest an exceptionally strong correspondence between the proposed theoretical framework and the observed data.

The validation of the complete sequence provides strong evidence that sustainable development is not driven by isolated, independent factors. Rather, development emerges from the coordinated functioning of multiple capacities. Social Capacity lays the societal foundations necessary for effective governance. Political Capacity translates societal aspirations into institutional capability. Economic Capacity transforms institutional capability into productive sophistication and sustainable prosperity.

The findings therefore provide empirical support for the Institutional Drivetrain Framework and reinforce the broader proposition that sustainable development is a sequential process. The evidence suggests that countries achieve sustainable development not merely because they accumulate wealth or improve governance, but because they integrate social, political, and economic capacities into a coherent developmental system.

Taken together, the results indicate that sustainable development is best understood as the outcome of interconnected capacity-building processes operating across society, institutions, and the economy. Structural transformation therefore extends beyond economic modernization and encompasses the progressive interaction among Social Capacity, Political Capacity, and Economic Capacity to generate sustainable human development.

6. Conclusion and Implications

6.1 Theoretical Implications

The findings of this study contribute to the growing literature on structural transformation, institutional development, and sustainable development by providing empirical evidence for a sequential developmental framework linking Social Capacity, Political Capacity, Economic Capacity, and Sustainable Development. Unlike conventional development approaches that examine these dimensions separately, the results suggest that they function as interconnected components of a broader developmental process.

A central theoretical implication of the study is that sustainable development should not be understood as the direct outcome of economic growth, institutional effectiveness, or productive sophistication acting independently. Rather, the findings indicate that development emerges through a sequence of interactions in which each capacity creates the conditions necessary for the next. The empirical evidence demonstrates that Social Capacity significantly strengthens Political Capacity ($\beta = .450$, $p < .001$), Political Capacity significantly enhances Economic Capacity ($\beta = .457$, $p < .001$), and Economic Capacity significantly contributes to Sustainable Development ($\beta = .048$, $p < .001$). Furthermore, Political Capacity mediated 65.39% of the relationship between Social Capacity and Economic Capacity, while Economic Capacity generated a suppressor effect of 297.76% on the relationship between Political Capacity and Sustainable Development. These findings provide strong support for viewing development as a sequential capability-building process rather than as a collection of isolated outcomes.

The study also contributes to the structural transformation literature by extending the concept beyond the traditional focus on sectoral shifts. Classical approaches have generally interpreted structural transformation as the movement of labor and resources from low-productivity to high-productivity sectors (Chenery, 1960; Kuznets, 1966; Lewis, 1954). The results presented here suggest that structural transformation also involves the strengthening and interaction of societal, institutional, and productive capacities. Development is therefore a multidimensional process that extends beyond economic restructuring alone.

A further implication concerns the governance literature. The findings challenge the assumption that effective governance automatically yields sustainable development outcomes. The negative direct relationship between Government Effectiveness and Planetary-adjusted Human Development indicates that institutional effectiveness, when disconnected from productive sophistication, may support forms of growth that are not necessarily sustainable. Governance capability therefore derives developmental significance not merely from its effectiveness but from its ability to facilitate productive transformation.

Finally, the study contributes to the economic complexity literature by showing that productive sophistication serves a developmental function that extends beyond economic growth. Economic Complexity emerges as the mechanism through which governance capability is translated into sustainable human development. This finding underscores the importance of productive capabilities as a bridge between institutions and human flourishing.

6.2 Policy Implications

The empirical findings generate several important implications for development policy and practice.

First, the results suggest that development strategies should place greater emphasis on strengthening Social Capacity. Variables such as civic participation, accountability, public trust, citizen engagement, freedom of expression, and collective responsibility should not be viewed solely as democratic objectives. Rather, they should be understood as developmental assets that contribute to improved governance and stronger productive systems. Societies that cultivate these capabilities appear better positioned to build effective institutions and sustain development progress.

Second, the findings indicate that governance reforms should go beyond administrative efficiency alone. While strengthening public institutions remains important, effective governance is unlikely to yield sustainable development unless it contributes to productive transformation. Governments should therefore prioritize institutional reforms that enable technological upgrading, innovation, productive diversification, industrial learning, and long-term capability accumulation.

Third, the results underscore the developmental importance of Economic Capacity. The evidence indicates that productive sophistication plays a decisive role in generating sustainable human development outcomes. Accordingly, policies that strengthen innovation systems, technological capabilities, industrial upgrading, research and development, advanced manufacturing, and knowledge-intensive production are likely to produce broader and more durable development benefits than policies focused exclusively on output expansion.

Fourth, the findings suggest that development interventions should be designed as interconnected, sequential processes. Social, Political, and Economic Capacities appear to reinforce one another. Consequently, fragmented interventions that focus on governance, economic growth, or social engagement in isolation may be less effective than integrated approaches that address all three dimensions simultaneously.

More broadly, the results imply that countries seeking sustainable development should focus on building development systems that strengthen societal participation, improve institutional effectiveness, and enhance productive sophistication simultaneously. Sustainable development appears most likely to emerge when these capacities evolve together rather than separately.

6.3 Limitations and Directions for Future Research

Despite its contributions, this study has several limitations that should be acknowledged when interpreting the findings. These limitations do not diminish the significance of the results but instead clarify the scope of the conclusions and identify opportunities for future investigation.

First, the study relied exclusively on secondary data from internationally recognized databases. Although these datasets provide standardized, internationally comparable measures, they may not fully capture the historical, cultural, institutional, and contextual factors that influence

development processes within individual countries. Consequently, the findings should be interpreted as identifying broad cross-national patterns rather than as exhaustive explanations of national development trajectories.

Second, the study operationalized Social Capacity, Political Capacity, Economic Capacity, and Sustainable Development using Voice and Accountability, Government Effectiveness, Economic Complexity, and the Planetary-adjusted Human Development Index, respectively. Although these indicators are theoretically appropriate and widely accepted proxies, they do not capture all dimensions of the underlying concepts. Future studies may incorporate broader measures of social trust, civic responsibility, institutional resilience, innovation capability, technological readiness, and environmental sustainability to further assess the robustness of the proposed framework.

Third, despite the use of System GMM, causal mediation analysis, and Structural Equation Modeling to address endogeneity, dynamic persistence, and indirect effects, omitted-variable bias cannot be fully ruled out. Development outcomes are shaped by numerous factors, including historical legacies, demographic transitions, geographic conditions, geopolitical circumstances, and cultural dynamics. Future research may therefore extend the model by examining additional explanatory variables and alternative development pathways.

Fourth, the analysis was conducted at the national level using country-level observations. While this approach is appropriate for identifying broad developmental patterns, it may obscure substantial variation within countries. Future research may apply the proposed framework to subnational units, such as states, regions, provinces, or metropolitan areas, to examine how developmental capacities interact within more localized institutional settings.

A further limitation concerns the temporal scope of the study. Although the dataset spans twenty-two years, capability transformation is inherently a long-term process that often unfolds over several decades or generations. Longer historical studies may therefore provide deeper insight into the cumulative effects of social, political, and economic transformations on sustainable development outcomes.

Beyond these methodological considerations, the study opens several promising avenues for future research. Comparative case studies of countries with similar economic conditions but varying levels of sustainable development could yield deeper insight into the mechanisms by which capacities interact. Future research may also examine developmental threshold effects, including the minimum levels of Social Capacity required to generate significant improvements in Political Capacity, or the levels of Economic Capacity necessary to produce substantial gains in Sustainable Development.

Finally, future studies may seek to apply the framework to subnational entities, as well as to firms, families, and even individuals. The results of such work would be particularly useful for assessing the extent of the framework's generalizability.

6.4 Conclusion

This study examined the relationships among Social Capacity, Political Capacity, Economic Capacity, and Sustainable Development within the broader context of structural transformation. Using a balanced panel dataset covering 132 countries from 2002 to 2023, the study tested a sequential framework in which Social Capacity contributes to Political Capacity, Political Capacity to Economic Capacity, and Economic Capacity to Sustainable Development.

The results consistently support this developmental sequence. Social Capacity significantly influenced Political Capacity, Political Capacity significantly enhanced Economic Capacity, and Economic Capacity significantly improved Sustainable Development. The mediation analyses further demonstrated that Political Capacity functions as a transmission mechanism linking Social Capacity and Economic Capacity, while Economic Capacity serves as the pathway through which Political Capacity contributes to sustainable human development.

Most importantly, the complete pathway linking Voice and Accountability, Government Effectiveness, Economic Complexity, and Planetary-adjusted Human Development remained positive and statistically significant. These findings provide strong empirical support for the argument that sustainable development emerges from an interconnected developmental process rather than from isolated improvements in governance, economic growth, or social participation.

The study therefore concludes that sustainable development is best understood as the outcome of the interaction among social, political, and economic capacities, functioning as an integrated developmental system. Structural transformation extends beyond economic modernization and encompasses the progressive strengthening and interaction of societal, institutional, and productive capabilities.

Accordingly, the evidence suggests that societies achieve sustainable development not merely because they accumulate economic resources or improve governance, but because they build and align the capacities needed for sustained human flourishing. This perspective offers a more comprehensive explanation of differences in development outcomes across countries and provides a useful framework for understanding sustainable development in the twenty-first century.

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