Research Article

Debasish Roy*

Formulation of Governance and Democracy Index (GDI) and Governance, Democracy, and Emancipation Index (GDEI): A Cross-country Empirical Study (1998 – 2017)

<https://doi.org/10.1515/openps-2021-0002>

received July 6, 2020; accepted August 10, 2020.

Abstract: This research paper is aimed at formulation of a composite Governance and Democracy Index (GDI) based on the six indicators of good governance by Kaufmann *et al.* (2003, 2007) to assess and evaluate the *relative* performances of 10 major democracies of the world for the time period of 20 years (1998 – 2017) (Base Year = 1996). In order to do so, three distinct methodologies are adopted based on the absolute values and relative changes in the observations of independent variables. The extended part of this research involves formulation of Governance, Democracy, and Emancipation Index (GDEI) which incorporates the Emancipative values.

Keywords: Control of Corruption Relative (CCR); Government Effectiveness Relative (GER); Political Stability Relative (PSR); Governance and Democracy Index (GDI); Governance and Democracy Index Area (GDIA); Governance, Democracy, and Emancipation Index (GDEI).

JEL Classifications: C10; C43; C65; H11; P52.

1 Introduction

The modern concept of governance originated from the Greek verb κυβερνάω (*kubernáo*) as coined by Plato which means “to steer” – and it should be the focal theme of a political leader (*Republic* 8.551c). According to Shin (2016), “Whereas government is a descriptive term that refers to the official institutions of a state, the term governance has had a normative cast since its inception, signifying forms of rule that produce desired ends”. In the neoliberal regime, the states diffuse power by devolution, allocating responsibilities to supranational, regional, and sub-national organizations by ‘contracting out’ responsibilities to private firms and corporations (e.g., World Bank, International Monetary Fund (IMF), etc.), and by fostering the exercise of autonomy as a duty to manage itself according to the neoliberal principles, such as rational and responsible ‘choice’ (Novas and Rose, 2000; Rose, 2001). According to Rittel and Webber (1973), the major reason why the states have to depend on other agents and share their power is the growing complexity of our modern day societies and the emergence of ‘wicked problems’. Roberts (2000) has opined that these problems encompass a high level of conflict among the stakeholders where there is neither an agreement about the problem nor an amicable solution. Under these *stalemate* situations, the public sector organizations form an agreement with private sector organizations and citizens in order to reach decisions regarding implementation of policies. According to Mendoza and Vernis (2008), these *wicked problems* require the establishment of collaborative processes between public agencies and other public, civil, society and business organizations. Due to globalization and

*Corresponding author: Debasish Roy, Research Scholar, Department of Management, Sikkim University, Gangtok - 737102, Sikkim, India, E-mail: debasish2000@yahoo.com, debasish2000@gmail.com

internationalization of problems, the major idea of governance is related to shifting of powers in every direction. Apart from the shifting of powers, governance may show flexibility and adopt the following domains as: A *structure* referring to the formal and informal set of institutions involved; a *process* referring to the dynamics and leading functions that take place in the process of policy making; a *mechanism* referring to the institutional procedures of decision-making, as well as compliance and control; and a *strategy* referring to the manipulation of the institutional and mechanical design with the aim of influencing choices and preferences (Levi-Faur, 2012).

On the other hand, liberal democracy acts as the proper foundation of good governance and economic development. Researchers like Olson (1993) and Rodrik (1999) have showed that the countries which had achieved the highest form of economic performance were all stable democracies.

Dahl (1971) emphasized that a truly representative democratic government must be based on the principles of popular sovereignty; competitive political participation and representation; free, fair, and regular elections; universal suffrage; freedom of expression and conscience; the universal right to form political associations and participate in the political process; inclusive citizenship; and adherence to the constitution and rule of law.

According to Sen (2001), democracies help to enrich and improve individual lives through granting of political and civil rights, and help to improve the level of welfare for the poor as compared to other political systems. Thus by taking a cue from the prior scholarly works, this research work is aimed at formulating a composite Governance and Democracy Index (GDI) based on the six indicators of good governance by Kaufmann *et al.* (2003, 2007) which would be able to successfully project the standings of the sample countries in terms of governance and democratic yardsticks for the given time period of 20 years. Out of those six indicators; five indicators, viz., Control of Corruption (CC), Government Effectiveness (GE), Political Stability (PS), Regulatory Quality (RQ), and Rule of Law (RL) are *grouped* together to represent the concept of *governance* whereas the sole remaining indicator, i.e., Voice and Accountability (VA) is singled out to represent the concept of *democracy*. Three distinct methodologies were followed to formulate the GDI: *first*, the technique of estimating the *Geometric Mean (GM)* of the six indicators using the *Quantity Relative Index* method with **Base Year = 1996**; *second*, a *Geometric Mean (GM)* of all the six indicators was taken into account; followed by estimation of Governance and Democracy Index Areas (GDIA) of 7 sample countries with lower and upper bounds of integrals as -2.5 and 2.5 respectively where larger GDIA translates to better ranking of the country in terms of governance and democratic practices; and *third*, the GDI is derived by summation of *Government and Democracy Index Relative Change* (GDIRC) of each indicator comprised of equal weights of 10 percent each for the first five indicators (variables) which collectively represent *Governance* and 50 percent weight for the remaining indicator (variable) representing *Democracy* (**Base Year = 1996**) (no change) since according to one of the fundamentals of statistical theory, the GDI for the base year should be 100.

For the first two methods, 7 out of 10 sample countries were considered for estimation since all the values of 6 variables were *positive* for those seven countries.

2 Data Descriptions

The Metadata for (the) six chosen variables from (the) World Bank¹ database are quoted as given below:

- **Control of Corruption:**
“Control of Corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as “capture” of the state by elites and private interests. Estimate gives the country’s score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5” (World Bank);
- **Government Effectiveness:**
“Government Effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies. Estimate gives the country’s score on the

¹ Data available at: <https://datacatalog.worldbank.org/dataset/worldwide-governance-indicators>

aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5” (World Bank);

– **Political Stability:**

“Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Estimate gives the country’s score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5” (World Bank);

– **Regulatory Quality:**

“Regulatory Quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Estimate gives the country’s score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5” (World Bank);

– **Rule of Law:**

“Rule of Law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Estimate gives the country’s score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5” (World Bank); and

– **Voice and Accountability:**

“Voice and Accountability captures perceptions of the extent to which a country’s citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. Estimate gives the country’s score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5” (World Bank).

From the Metadata of the six variables given above, the logic behind segregating them into two distinct groups could be easily deduced. The first 5 variables could be directly attributed to the fundamental features of *Governance* and the remaining one, i.e., Voice and Accountability could be directly related to the founding pillars of *Democracy*.

3 Literature Review

The concept of democracy does not depend on a single theory but it is a collection of approaches, viz., participation, representation, popular elections, citizenship, and the ability to choose freely among political options or alternatives. Zanetti (2007) has broadly classified democratic theory into *two* categories: (a) Classical Democracy (Greece), and (b) Representative Democracy.

(a) Classical Democracy (Greece)

The concept of democracy originates from the Greek word *Demokratia* which means “people-power” or “people-rule”. By the time of Aristotle (4th Century BCE), there were a collection of 1,500 *polies* or city-states. The majority of them followed democratic norms but a few of them were *oligarchies* where power (both administrative and judicial) was concentrated in the hands of a few elites while a few others were *monarchies*. Out of those democracies, the most stable system was of Athens’. By the late 460s’ BCE, Ephialtes and Pericles engineered a political system that successfully helped to balance power among economic classes and paved the foundation of modern Western rational and critical thought. The major drawback of Athenian democracy was the non-inclusion of slaves, foreigners and women. The crux of political power lay in the hands of a charismatic leader with strong rhetorical skills and the assembly which led to imprudent and biased decision-making in many cases.

The most striking feature of Athenian democracy was the practice of Ostracism – the *reverse* process of the recalling of a selected representative and sending him to exile for ten years. It required a polling of at least 6000 “citizens” to strip-off power from an elected representative. This practice led to massive social and civil unrest which lasted for nearly 100 years and finally got replaced by a legal procedure consisting of jury system by the end of the 5th century BCE;

(b) Representative Democracy:

After the decline of Athenian democracy, it revived again in the age of Italian Renaissance and European Enlightenment finally taking the form of American political system. Scholars like Thomas Hobbes, John Locke, and Jean-Jacques Rousseau laid the foundations for social contract theory. Montesquieu worked on the separation of powers while Jeremy Bentham, John Stuart Mill, Adam Smith, and Thomas Malthus explored the concepts of market, economy and welfare. The Representative democracy may be broadly divided into two sub-categories: Republicanism and Liberalism.

Republicanism:

Republicanism may be defined as a commitment to the principle of a public element (*res publica*) which may be legitimately interpreted by the citizens. The two major types of republicanism are *narrower* and *developmental* in nature respectively. The narrower and more protective form of republicanism may be found in the smaller communities where women, laborers, and dependents were deprived of citizenship and voting despite the existence of the rule of law, freedoms of speech and expression, and political participation. This type of republicanism existed in the Italian city-states in the Renaissance period. On the other hand the developmental form of republicanism allowed citizens to enjoy political and economic equality so that it rules out the scope of authoritarianism and everyone could benefit from self – determination and work towards social welfare. Citizens can participate in public meetings which result in the formulation of legislature, and the executive functions are controlled by separate administrators either elected or chosen by people. This form of republicanism is closely associated with Rousseau's doctrines. Based on the works by John Locke, Hugo Grotius, Samuel Pufendorf *et al.*, the American colonists emphasized on three common elements, viz., a commitment to republican (representative) government, a cyclical theory of corruption, and a belief in republican ideology as the founding pillars of republicanism. By keeping in mind of the fact that over-indulgence in self – interest often leads to corruption and erosion of a given social-system, republicans preferred a balance between individualism and social commitment. The concept of ethical citizenship incorporates access to common public goods, popular control of government, some meaningful degree of substantive (materialistic) equality, acceptance of civic virtue, and commitment to active participation by the masses of the society;

Liberalism

Liberalism, supposedly, is one of the most controversial doctrines of political studies. It may be broadly classified into Lockean and Kantian variants – the cores of which promote the championing of self – interest in a most aggressive manner. Individual freedom is the major guiding light of liberalism. The first variant of liberalism based on the works of John Locke and John Stuart Mill, i.e., the “utilitarian” liberalism is based on the concept of maximizing the social welfare by allowing individuals to pursue their own life – goals provided they do not interfere with other people's lives or intentionally violate societal rules / norms. On the other hand, the proponents of Kantian variant of liberalism treat every individual as a separate entity with separate sets of choices and preferences. Hence they call for a fair framework in society where individuals and groups are free to choose their own values and ends by providing room for similar sets of choices and preferences for others. In the real world scenario, the Lockean variant seemed to be more popular since it was tailor – made for the growing number of middle – class families who wanted to lead feudalistic lifestyles based on economic well-being.

In the twentieth century, a new variant of democratic theory emerged which is known as *technocratic democracy*. The technocratic form of democracy became compatible with the evolution of the technocratic, bureaucratic, or administrative state.

The technocratic democracy was an answer to the trend of increasingly complex business form of government. Merit instead of social standing became the deciding factor in choosing employees in civil services became one of the ‘key’ points in this form of democracy. The other feature of this variant was the industrial societies with fragmented socio – political conflicts. Although there was the option of universal voting rights, the electorate was either poorly informed or easily manipulated by political rhetoric. A strong administrative branch took charge to check the political

excesses by the elected body. By the end of twentieth century, this form of democracy gave way to the political process called neoliberalism.

The major feature of *Neoliberalism* is to expand and intensify the concept of market values in the societies. The emphasis on property shifted to *contract* in this form of democratic model. The labor markets around the world were most affected as the contract periods were of shorter duration characterized by higher frequencies. The employees were subject to continual assessments. In contrast to classic liberal societies, the neoliberal societies became network societies. The striking difference between a neoliberal form and other forms of democracy is that neoliberalism is an economic model which treats the society or the world as a whole in terms of a market metaphor. In this model, nations are treated as companies or corporations and individuals as consumers. In this newest form of democratic model, cities, states and countries are all competing among themselves to prove their superiority in terms of 'better-connected' and 'more advanced' market forms.

In the contemporary times, many scholars have argued that democratic states have become persistently hollow from the core and failed to reach out to the marginalized and downtrodden communities. The involvement of citizens has been restricted for voting purposes only and the "Winner take all" mindset of the political parties has gradually marginalized the sections of citizens who do not conform to the winning party's philosophy.

Hence the concept of *Deliberative* or *Discursive* Democracy came into the fore which emphasized on the 'trade-off' between consensus decision-making and representative democracy. The proponents of deliberative democracy argue that legitimate lawmaking can be obtained through public deliberation of citizenry only. Although deliberative democracy provides room for tensions or conflicts of interests among citizenry, less attention has been paid to it since it has failed to prove itself as a "suitable complement" to representative democracy.

On the other hand, to quote Ysa *et al.* (2014): "In summary, governance can be understood as an interactive phenomenon in which public, private and non-profit actors interact to establish and implement public policies. Some key determinants of this form of governing are the emergence and empowerment of different actors, either public or private, with whom the state has to deal, and the loss of hierarchical forms of governance in favor of a relatively more equal power distribution (van den Berg, 2011)". According to the International Monetary Fund (1997), "promoting good governance in all its aspects, including by ensuring the rule of law, improving the efficiency and accountability of the public sector, and tackling corruption, are essential elements of a framework within which economies can prosper". However, critics of neoliberalism have pointed out that the rhetoric of good governance can mask neo-imperialist policies and practices (Shin, 2016). Scholars like Kjær (2004) and Bevir (2012) have pointed out that when efficiency becomes the fundamental priority, governance can impair participation, democratic inclusion, social well-being and encourages the marginalization of women in political participation. In addition to that, governance can become a tool to control states through a coercive hierarchy of international financial organizations and networking in the markets which are politically unaccountable. Singapore is a nation which is characterized by strong governance but an extremely weak form of democracy or quasi – dictatorship. According to Norris (2011), three major criteria, i.e., validity, reliability, and legitimacy are particularly important to measure the health of democratic governance.

To sum up, Sharma (2007) has argued that in the era of free market economies, the countries must successfully cope with the demands of economic development, political and social integration, and greater demand for a more equitable distribution of economic growth by the combination of good governance and liberal democratic norms.

4 Methodology

- As discussed earlier, the *first* method of estimating the Governance and Democracy Index (GDI) involved calculations of the *Geometric Means (GM)* of the *Quantity Relative Indices* (Base Year = 1996) (Das, 2008) of the six indicators for 7 sample countries by using the following equations as:

Control of Corruption Relative (CCR) for 1998 =

$[\text{Control of Corruption (CC) for 1998} / \text{Control of Corruption (CC) for 1996}] \times 100,$

Government Effectiveness Relative (GER) for 1998 = $[\text{Government Effectiveness (GE) for 1998} / \text{Government Effectiveness (GE) for 1996}] \times 100,$

Political Stability Relative (PSR) for 1998 =

[Political Stability (PS) for 1998 / Political Stability (PS) for 1996] $\times 100$,
 Regulatory Quality Relative (RQR) for 1998 =
 [Regulatory Quality (RQ) for 1998 / Regulatory Quality (RQ) for 1996] $\times 100$,
 Rule of Law Relative (RLR) for 1998 =
 [Rule of Law (RL) for 1998 / Rule of Law (RL) for 1996] $\times 100$, and

Voice and Accountability (VAR) for 1998 =

[Voice and Accountability (VA) for 1998 / Voice and Accountability (VA) for 1996] $\times 100$.

Hence for the year 1998, Governance and Democracy Index (GDI) = $(CCR \times GER \times PSR \times RQR \times RLR \times VAR)^{1/6}$ and the same procedure is followed for the remaining years of the time-series (Refer to Figures: 1 – 7);

- The *second* method of estimating the Governance and Democracy Index (GDI) involved simple estimations of the *Geometric Means (GM)* of six indicators. Formally,
 Governance and Democracy Index (GDI) = $(CC \times GE \times PS \times RQ \times RL \times VA)^{1/6}$ (Refer to Figures: 8 – 14).
 Following the estimations of GDIs' for the sample of 10 countries, their respective Governance and Democracy Index Areas (GDIA) were estimated for the time period of 20 years (1998 – 2017). The GDIA of each sample country is estimated by using the method of definite integral within the *bounded region* between the lower and upper limits of -2.5 and 2.5 for each of the 6 variables respectively by following the relationship below (Das and Mukherjee, 2000, p.131):

$$\int_{-a}^{+a} f(x)dx = 2 \int_0^a f(x)dx$$

when $f(x)$ is an *even* function of x , i.e., $f(-x) = f(x)$.

For example, the linear regression equation of GDI for Denmark is:

$$GDI = -0.024 + 0.12CC + 0.15GE + 0.25PS + 0.17RQ + 0.15RL + 0.19VA$$

Hence the GDIA of Denmark could be estimated as:

$$\begin{aligned} GDIA &= -0.024 + 0.12 \times 2 \int_0^{2.5} CCdCC + \\ &0.15 \times 2 \int_0^{2.5} GE dGE + \\ &0.25 \times 2 \int_0^{2.5} PS dPS + \\ &0.17 \times 2 \int_0^{2.5} RQ dRQ + 0.15 \times 2 \int_0^{2.5} RL dRL + 0.19 \times 2 \int_0^{2.5} VA dVA \\ &\rightarrow GDIA = -0.024 + 0.12 \times 2 [CC^2 / 2]_0^{2.5} \\ &+ 0.15 \times 2 [GE^2 / 2]_0^{2.5} + 0.25 \times 2 [PS^2 / 2]_0^{2.5} \\ &+ 0.17 \times 2 [RQ^2 / 2]_0^{2.5} + 0.15 \times 2 [RL^2 / 2]_0^{2.5} + 0.19 \times 2 [VA^2 / 2]_0^{2.5} \\ &\rightarrow GDIA = -0.024 + 6.25 \times (0.12 + 0.15 + 0.25 + 0.17 + 0.15 + 0.19) \\ &= 6.4135 \approx 6.4 \text{ square units.} \end{aligned}$$

Proceeding likewise, the GDIA's of the remaining sample countries were estimated (Refer to Table 2); and

- Finally, the *third* and final method of estimating the GDIs' of all the 10 sample countries is described below:

In order to estimate the *Relative Changes (RC)* for each of the variables (Base Year = 1996), initially the traditional method was applied. For example,

Control of Corruption Relative Change (CCRC) = [(Current Year Value – Base Year Value) / Base Year Value] $\times 100$, etc. This formula worked well when both the values for base and current year were *positive*. However, complications cropped up when there was *heterogeneity* in variables, i.e., when one of the variables turned out to be negative in nature or when both the variables were negative. Thus three different techniques were used to tackle the problems associated with enumeration as follows:

(i) Positive value for Base Year and Negative value for Current Year:

In this scenario, the formula for Relative Change (RC) would be:

$$\text{Relative Change (RC)} = [(\text{Current Year Value} / \text{Base Year Value}) \times 100] - 100$$

By using this formula, the relative changes for the necessary variable (variables) was (were) estimated for 3 countries, i.e., USA, India, and France, wherever applicable;

(ii) Negative value for Base Year and Positive value for Current Year:

In this case, the formula for Relative Change (RC) would be:

$$\text{Relative Change (RC)} = [-(\text{Current Year Value} / \text{Base Year Value}) \times 100] + 100$$

By applying this formula, the relative changes for the necessary variable (variables) was (were) estimated for 3 countries, i.e., USA, India, and France, wherever applicable;

(iii) Negative values for both Base Year and Current Year:

The formula for Relative Change (RC) in this scenario is exactly the *inverse* of the formula which has been used for calculating the relative change between two *positive* numbers.

Formally, it may be expressed as:

$$\text{Relative Change (RC)} = [-(\text{Current Year Value} - \text{Base Year Value}) / \text{Base Year Value}] \times 100$$

By applying this formula, the relative changes for the necessary variable (variables) was (were) estimated for only *one* country, i.e., India, wherever applicable.

In the next step, 10 percent weightage was allotted to the relative changes for 5 variables individually, i.e., Control of Corruption Relative Change (CCRC), Government Effectiveness Relative Change (GERC), Political Stability Relative Change (PSRC), Regulatory Quality Relative Change (RQRC), and Rule of Law Relative Change (RLRC) whereas 50 percent weightage was allotted to Voice and Accountability Relative Change (VARC) respectively. In other words, CCRC, GERC, PSRC, RQRC, and RLRC were *individually* multiplied by 0.1 and VARC was multiplied by 0.5 (in this way, 50 percent weightage was allocated to the relative changes in the Governance indicators and the remaining 50 percent weightage was allotted to the Democracy indicator) and the results were summed up to derive the values of Governance and Democracy Indicators Relative Change (GDIRC) for all the 10 sample countries.

Finally, the values of GDIRC (either positive or negative) were added to 100 to produce the year wise values of GDI for the sample countries since the Base Year Value of GDI (Base Year = 1996) has been assumed to be 100 according to the standard norm of statistical theory (Refer to Figures: 15 – 24).

Hence GDI under the third method is nothing but the *Weighted Arithmetic Mean* of the relative changes of six variables with regards to a base year representing the attributes of Governance and Democracy collectively for a country.

Formally, the steps mentioned above could be expressed as:

$$GDIRC = 0.1(CCRC + GERC + PSRC + RQRC + RLRC) + 0.5 \times VARC, \text{ and } GDI = 100 \pm GDIRC$$

The *third* and final method could be treated as the ‘fittest’ method as it included both positive and negative values for the observations and encompassed all the 10 sample countries as well. This method of estimation of GDI may be replicated for any country regardless of the values of the variables (both positive and negative included) and definitely more comprehensive in nature as compared to the first and second methods.

5 Results and Findings

- The statistical results for linear regression equations of GDI for 7 sample countries by the *first* method established the fact that Political Stability Relative (PSR) was the most statistically significant factor for all the countries in predicting their GDIs'. The other factors which were important in affecting GDIs' were Rule of Law Relative (RLR), Voice and Accountability Relative (VAR), and Regulatory Quality Relative (RLR) (Insert Table 1);
- The statistical results for linear regression equations of GDI along with the GDIA's and respective rankings for 7 sample countries by the *second* method clearly infer the fact that Denmark was the top-ranking country in terms of upholding the constituents of governance and democracy among the seven sample countries for the time period of 20 years (1998 – 2017). The second place was tied between Germany and Sweden with same GDIA and the UK was at the bottom of the list for which Political Stability (PS) was the *only* statistically significant variable at 5 percent level of significance or better. In other words, for the UK, apart from Political Stability (PS), none of the other 5 variables played a statistically significant role for regressing GDI (Insert Table 2);
- Finally, the descriptive statistics of all the 10 sample countries would provide a clear picture about their GDIs' and related information under the *third* and final method for the time period 1998 – 2017 (Insert Table 3). Germany proved to be the *most consistent* country as its Coefficient of Variation (C.V.) was minimum (approximately 2.5%), followed by Sweden (approximately 3%) and Denmark (approximately 3.5%) respectively. Three major democracies, i.e., USA, France, and Japan showed high levels of volatility in their GDIs' with C.V.s' of 6.52, 6.02, and 7.09 percent respectively. India fared worst in terms of consistency with the highest Coefficient of Variation (C.V. $\approx$ 14.46%) among the sample countries (Insert Table 3);
- The missing observations of all six variables of 10 sample countries were estimated by using Ordinary Least Squares (OLS) method (Das, 2008) and were plugged in accordingly to ensure the completeness and comprehensiveness of the time series (1998 – 2017) (Refer to Figures: 25 – 34); and
- The coefficients' values of the regressors of GDIs' for each of the 7 sample nations for the time period of 20 years (1998 – 2017) are econometrically tested by using the software GRETL v.1.9.4 for their statistical significance at 5 percent level or better under *first* and *second* methods. Barring the exception of a single country, i.e., U.K., the regression results for remaining 6 countries displayed statistically significant results for the coefficients of all the 6 variables (regressors) at 5 percent level or better. For the U.K., by both methods, only the coefficient of one regressor, i.e., Political Stability (PS), was statistically significant at 5 percent level or better. The first attempt under both methods resulted in estimation of the coefficient of Rule of Law (RL) at 10 percent level of significance or better for the U.K., thus the second attempt in iterating the entire process by dropping the variable RL resulted in a statistically significant result for the sole coefficient of PS at 1 percent level or better.

It should be noted that all the conducted econometrical tests based on the Classical Linear Regression Model (CLRM) (Gujarati, 2003) and executed by Ordinary Least Squares (OLS) method have successfully passed the Granger and Newbold's (1974) *Thumb rule test of Econometric Regression* for verification of *spuriousness* in regression (Refer to Tables: 4 – 19).

6 Governance, Democracy, and Emancipation Index (GDEI): a plausible extended area of application for Governance and Democracy Index (GDI)

An important scholarly work by Spaizer *et al.* (2014) helped to throw light on an important issue of incorporating the effects of changes for the democratic countries in terms of economic, cultural, and democratic values. They applied a Bayesian dynamical systems approach (Ranganathan *et al.*, 2014) to identify the best model which helped to capture the complexities of those changes. Their work included major indicators like Human Rights Democracy (D), Human Development Index (H), and Emancipative values (E) spread across 65 sample countries for the time period of 26 years (1981 – 2006). Out of a total of 17 differential equations used in their research, only 2 suitable differential equations were chosen in order to explore a wider horizon closely correlated to GDI. The necessary differential equations were as follows:

$$\frac{dD}{dt} = 0.071H^2 - 0.066D \quad (1),$$

and

$$\frac{dE}{dt} = 0.006HD \quad (2)$$

(t = Time)

Clearly, those equations are differential equations of *first order and first degree* (Das and Mukherjee, 2000). Equation: (1) may be reformatted as:

$$\frac{dD}{dt} + 0.066D = 0.071H^2 \quad (3)$$

Equation: (3) could be solved by using the traditional method of Integrating Factor (IF) as below (Das and Mukherjee, 2000):

$$\begin{aligned} \frac{dD}{dt} e^{\int 0.066 dt} + 0.066 D e^{\int 0.066 dt} &= 0.071 H^2 e^{\int 0.066 dt} \\ \rightarrow \frac{d}{dt} (D e^{\int 0.066 dt}) &= 0.071 H^2 e^{\int 0.066 dt} \end{aligned}$$

By integrating both sides, we have:

$$\begin{aligned} D e^{0.066t} &= (0.071 / 0.066) H^2 e^{0.066t} + C \\ \rightarrow D &= 1.08 H^2 + C_1 \end{aligned} \quad (4)$$

where $C_1 = C e^{-0.066t}$ = Constant of integration.

By using the values of the UNDP Human Development Index (H)² data for the time period of 20 years (1998 – 2017) for one of the sample countries, i.e., Denmark, and plugging the values of H in equation: (4), the estimated results are documented (Refer to Figure 35) and followed by a regression analysis. The regression result of D on H may be expressed as below (Refer to Figure 36):

$$D = -0.86 + 1.93H \quad (5)$$

Equation: (5) represents the *final* linear regression equation of D on H for Denmark tested at 5 percent level of significance or better.

Equation: (2) may be rewritten as:

$$dE = 0.006HDdt$$

By integrating both sides of the above equation, we get:

$$\begin{aligned} \int dE &= 0.006HD \int dt + K \\ \rightarrow E &= 0.006HDt + K \end{aligned} \quad (6)$$

where K = Constant of integration, t = 1, 2, ..., 20.

² Data available at: <http://hdr.undp.org/en/data>

Now by substituting the value of D from equation: (5) in equation: (6), we get:

$$\begin{aligned} E &= 0.006Ht(-0.86 + 1.93H) + K \\ \rightarrow E &= 0.1158H^2t - 0.00516Ht + K \end{aligned} \quad (7)$$

By the help of equation: (7), the values of E are estimated and documented for the time series 1998 – 2017 (Refer to Figure 37). Finally, the regression result of E on H is expressed below as (Refer to Figure 38):

$$E = -1.05 + 1.22H \quad (8)$$

Equation: (8) represents the *final* linear regression equation of E on H for Denmark tested at 5 percent level of significance or better.

Finally, by plugging the values of HDIs' (H) of Denmark for the time series 1998 – 2017 in equation: (8), the respective values for E could be derived.

The Governance, Democracy, and Emancipation Index (GDEI) for Denmark is formulated as the *Weighted Arithmetic Mean* of Governance and Democracy Index (GDI) (estimated under *third* method) and Emancipative value (E) with equal weights of 50 percent each.

Formally,

$$GDIE = 0.5(GDI + E)$$

The estimated values of GDIE for Denmark are documented (Refer to Table 20) and the evaluated Coefficient of Variation (C.V.) is approximately 3.5 percent which is identical to the C.V. for Denmark's GDI (under the third method) contemplating toward the *consistency* factor between two methods. This method could be replicated to enumerate GDIE for any country by using its GDI and Emancipation (E) values. Denmark has been used as a sample country to estimate GDEI. However, a negative correlation could be observed between the HDI (H) and GDI / GDEI. A plausible explanation may be related to the fact that an appreciation in the levels of HDI is associated with contraction of democratic values across the countries around the globe by mainly curbing the domain of Voice and Accountability (VA).

7 Limitations

- The first index, i.e., Governance and Democracy Index (GDI) was formulated by segregating 6 indicators (Kaufmann *et al.*; 2003, 2007) into two groups based on their definitions (metadata). The *perceived* differentiation between governance and democracy by the author is completely objective and might be comprehended differently by other researchers;
- The second index, i.e., Governance, Democracy, and Emancipation Index (GDEI) is basically an extension of GDI with an inclusion of Emancipative value (E) in the basic framework. Since the definition of emancipation is quite conceptual in nature and Spaiser *et al.* (2014) tried to 'normalize' it through mathematical interpretation, the inclusion of the Emancipative value (E) as an entirely a 'follow – up' methodology based on their previous works might invite technical or perceptual differences among the audience in terms of interpretation.

8 Conclusion

Parvin (2018) in his research has highlighted some of the glaring issues in the present day political scenario across the globe such as political disengagement, participatory inequality, and low or biased political knowledge among citizens which are eroding the values of current political systems. According to him, the central problem of participative or deliberative democracy is its failure to address the problems of the citizens' lives by their elected representatives due to the complexities of the socio – political systems. In order to find an alternative feasible solution, he has suggested for

a paradigm shift from citizen participation to representation. This research paper's primary objective was to formulate an index to evaluate the performance levels of 10 major democracies spread across the world based primarily on governance and democracy indicators followed by the inclusion of another variable, i.e., the emancipation value as an extension of the study under the existing framework of global participatory democracy. This research paper is; by no means, a work related to define changes in the current democratic system but a positive approach toward measurement of governance and democracy and a gateway to further research and applications.

Data Availability Statement: The data that support the findings of this study are available in:

1. <https://datacatalog.worldbank.org/dataset/worldwide-governance-indicators>;
2. <http://hdr.undp.org/en/data>

Conflict of Interests Statement: The author has NO interests with / or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

References

- Bevir, M. (2012). *Governance: A Very Short Introduction*. Oxford, UK: Oxford University Press.
- Dahl, R. (1971). *Polyarchy: Participation and Opposition*. New Haven, CT: Yale University Press.
- Das, B. C., & Mukherjee, B. N. (2000). *Integral Calculus (50th ed.)*. Calcutta, India: U. N. Dhur & Sons Private Limited.
- Das, N. G. (2008). *Statistical Methods (Vol. I & II)*. New Delhi, India: McGraw Hill Education (India) Private Limited.
- Granger, C.W.J., & Newbold, P. (1974). Spurious Regressions in Econometrics. *Journal of Econometrics*, 2(2), 111 – 120. DOI: [https://doi.org/10.1016/0304-4076\(74\)90034-7](https://doi.org/10.1016/0304-4076(74)90034-7)
- Gujarati, D. N. (2003). *Basic Econometrics (4th ed.)*. New York, NY: McGraw – Hill, Inc.
- Kaufmann, D., Kraay, A., & Mastruzzi, M. (May, 2003). *Governance Matters III: Governance Indicators 1996-2002*. Policy Research Working Paper, Washington D.C.: The World Bank. DOI: <https://doi.org/10.1596/1813-9450-3106>
- Kaufmann, D., Kraay, A., & Mastruzzi, M. (2007). *Governance Matters VI: Aggregate and Individual Governance Indicators, 1996-2006*. Policy Research Working Paper Series 4280, Washington D.C.: The World Bank.
- Kjær, A. M. (2004). *Governance*. Cambridge, UK: Polity Press.
- Levi-Faur, D. (2012). From “Big Government” to “Big Governance”? In D. Levi-Faur (Ed.), *The Oxford Handbook of Governance*, pp. 3 – 18. Oxford: Oxford University Press. DOI: 10.1093/oxfordhb/9780199560530.001.0001
- Mendoza, X., & Vernis, A. (2008). The changing role of governments and the emergence of the relational state. *Corporate Governance*, 8(4), 389 – 396. DOI: <https://doi.org/10.1108/14720700810899130>
- Norris, P. (2011). Measuring Governance. In M. Bevir (Ed.), *The Sage Handbook of Governance* (ch. 12), pp. 411 – 457. London, UK: Sage Publications Ltd. DOI: <http://dx.doi.org/10.4135/9781446200964>
- Novas, C., & Rose, N. (2000). Genetic Risk and the Birth of the Somatic Individual. *Economy and Society*, 29(4), 485 – 513. DOI: <https://doi.org/10.1080/03085140050174750>
- Olson, M. (1993). Dictatorship, Democracy and Development. *The American Political Science Review (September)*, 87(3), 567 – 576. DOI: 10.2307/2938736
- Parvin, P. (2018). Democracy Without Participation: A New Politics for a Disengaged Era. *Res Publica*, 24, 31 – 52. DOI: <https://doi.org/10.1007/s11158-017-9382-1>
- Plato (1994). *Republic* (R. Waterfield, Trans.). Oxford, UK: Oxford University Press. (Original work published 380 BCE).
- Ranganathan, S., Spaier, V., Mann, R. P., & Sumpter, D. J. T. (2014). Bayesian Dynamical Systems Modelling in the Social Sciences. *PLoS ONE* 9(1), e86468. DOI: <https://doi.org/10.1371/journal.pone.0086468>
- Rittel, H.W.J., & Webber, M. M. (1973). Dilemmas in a General Theory of Planning. *Policy Sciences*, 4, 155 – 169. DOI: <https://doi.org/10.1007/BF01405730>
- Roberts, N. C. (2000). Wicked Problems and Network Approaches to Resolution. *International Public Management Review*, 1(1), 1 – 19.
- Rodrik, D. (1999). *The New Global Economy and Developing Countries: Making Openness Work*. Washington D.C.: Overseas Development Council.
- Sen, A. (2001). Democracy as a Universal Value. In L. Diamond, & M. F. Plattner (Eds.), *The Global Divergence of Democracies*, pp. 3 – 17. Baltimore, MD: Johns Hopkins University Press.
- Sharma, S. (2007). Democracy, Good Governance, and Economic Development. *Taiwan Journal of Democracy (July)*, 3(1), 29 – 62.

- Shin, K.Y. (2016). Governance. In L. Disch, & M. Hawkesworth (Eds.), *The Oxford Handbook of Feminist Theory* (ch. 15), pp. 304 – 325. Oxford, UK: Oxford University Press.
- Spaiser, V., Ranganathan, S., Mann, R. P., & Sumpter, D. J. T. (2014). The Dynamics of Democracy, Development and Cultural Values. *PLoS ONE* 9(6), e97856. DOI: 10.1371/journal.pone.0097856
- van den Berg, C. F. (2011). *Transforming for Europe: the reshaping of national bureaucracies in a system of multi-level governance* (Doctoral thesis). Retrieved from <https://openaccess.leidenuniv.nl/handle/1887/16356>
- Ysa, T., Colom, J., Albareda, A., Ramon, A., Carrión, M., & Segura, L. (2014). *Governance of Addictions: European Public Policies* (ch. 1 & 2), pp. 1 – 26. Oxford, UK: Oxford University Press.
- Zanetti, L. A. (2007). Democratic Theory. In M. Bevir (Ed.), *Encyclopedia of Governance*, pp. 207 – 212. Thousand Oaks, CA: Sage Publications, Inc. DOI: <http://dx.doi.org/10.4135/9781412952613>