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Effects of ecological innovation, governance structure, and social development on the adoption of sustainable reporting in the global tourism industry

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ABSTRACT

This study analyzes the effects of institutional factors on adopting sustainability reporting in the worldwide tourism industry. Initially, it compiled the data on the organizational environment, including environment, social and governance performance, and sector-level macroeconomic control variables such as economic growth, exports, and tourism receipts from 2001 to 2019. For empirical estimations, it applies multiple panel estimators; pooled ordinary least square (OLS), fixed effect, and random effects model, while dynamic Generalized Method of Moments is applied to address endogeneity issues in panel data. The results report that environmental, social, and governance indicators are essential for sustainable tourism. Mainly, ecological and social circumstances are more prominent than others. Further, ecological innovation is considered essential for sustainability in this sector. This research suggests an innovative theoretical approach that exposes the importance of sustainability reporting in the tourism industry. It also provides the guideline to the regulators that they should expand their focus on the regulations of sustainability reporting on the tourism industry.

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1. Introduction

Tourism is now a significant sector among the four most prominent sectors, following food, chemical, and fuels, generating around 5 percent of 'the gross domestic product (GDP)' of the world and approximately 6 to 7 percent of employment

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(Manetti & Bellucci, 2016). Currently, the importance of awareness regarding business practices increased along with the growing concern regarding the issues faced by the economies, societies, and environments, such as growing social inequalities, climate change, and depletion of natural resources (Jones et al., 2016). Although the tourism industry initially gained a minor consideration than the extensive contaminating industries such as the manufacturing, mining, and chemical sectors. Recently, consumers and the public have been demonstrating growing attention to the adverse effects of tourism and demanding further evidence regarding the measures undertaken by tourism companies to mitigate the adverse impacts (Asongu & Nwachukwu, 2019). The growing concerns have motivated the tourism industries to transform their business operations effectively. Also, tourism companies must incorporate the initiatives to publish their reports regarding their environmental and social performance (Shaukat et al., 2016).

Reporting about sustainability is considered a tool for creating worthy relationships with investors (Guix et al., 2018), improving the firm's repute and image, and upholding public interest (Belkhir et al., 2017). Regarding the significance of reporting on sustainability, the importance of regulations and standards regarding how the company evaluates, collects, and presents non-financial performance also increases, including tourism companies (Brand et al., 2018). Recently, the 'global reporting initiative (GRI)' issued a set of procedures and guidelines to guide firms regarding reporting sustainability performance consistently and comparably (Ali Aden et al., 2022; Seele, 2016). Moreover, GRI has given supplements regarding the industry-specific for various economic sectors, comprising tour operators, transportation, and logistics (Ehnert et al., 2016). This outline has now become the most used and extensively accepted reporting standard by companies (Islam et al., 2016). Regardless of the enlarged emphasis on sustainability issues in the tourism industry, the adoption of GRI and practices of sustainability reporting by tourism industries are still under the research area (Ullah et al., 2022;Uyar et al., 2019a). Therefore, the current study addresses this gap by providing awareness about the acceptance of GRI in the tourism industry.

Sustainability reporting has voluntary nature that elevations the question of what motivates the companies to take part in these initiatives of reporting about sustainability (Nikolaeva & Bicho, 2011). In this matter, the industrial theory provides significant insights into the understanding of influence regarding the country-level factors on variants between the practices of sustainability reporting of the industries (Kaspereit & Lopatta, 2016). For example, a weak and ineffective regulatory atmosphere is unsuccessful in enforcing and promoting reasonable reporting and business practices (Melubo et al., 2019). In contrast, a strong and effective regulatory environment becomes a substantial driver and motivator (Shahzad et al., 2019). The significant role of institutions in building business behavior and sustainability practices is needed in the tourism sector (Qu et al., 2022).However, empirical studies investigating the drivers of sustainability reporting in the tourism sector are minimal, and most rely on a single country or a small number of corporations (Yadava & Sinha, 2016). Thus, abundant research needs to be accomplished for a sympathetic of the GRI in the tourism sector. Besides, the studies of Northey et al. (2019) and Bateman

et al. (2017) recommended further research to investigate the GRI reporting, particularly on sector tourism. Thus, the current study replies to the demands of past literature in terms of the experimental evidence on the reporting of sustainability on a comprehensive assortment of corporations (i.e., gaming, casinos, recreation and leisure services, tour operators, cruise lines, resort operators, motels and hotels, etc.) functioning in the sector of tourism (Nawaz & Hassan, 2016). Therefore, studying tourism and aviation sectors within the sustainability framework is equivalently essential, and the tourism sector is heavily dependent on the aviation sector (Gössling & Peeters, 2007).Recent studies exposed that the tourism sector is implementing sustainability practices at a languid pace and far from satisfactory levels (Qu et al., 2022; Mihalic, 2016). Thus, the current study endeavored to consider the process of sustainable development by investigating contextual aspects connected with the level of sustainability in the tourism industry. In this wisdom, this study intended to aggravate policymakers about tourism to take on an active role in tourism practices. Finally, the present study is one of the first to investigate the influence of institutional drivers along with three domains (social, governance, and ecological) of sustainability reporting based on GRI in the tourism industry.

The remaining part of the research is structured as under: The following section shows the literature regarding the past studies and hypotheses development. Section 3 explains the methodology of the study. Sections 4 and 5 deal with findings and discussions on the results. Finally, this study concludes and provides future research implications, limitations, and directions.

2. Literature review

A suitable theoretical tool provided by the institutional theory to recognize the behavior differs from GRI based on the institutional environment represented by media, social movement companies, non-government organizations (NGOs), customers, regulatory bodies, and government (Haller et al., 2018). A country's institutional environment has provided the structures that monitor the organizations to undertake appropriate as well as inappropriate operations (Traxler et al., 2018). Organizations must show responsiveness to these forms of institutions to obtain acceptance, trust, and legitimacy (Gallén & Peraita, 2017). The institutional theory postulates the act of the organizations must be in the ways of social responsiveness in the environments with collective self-regulation of NGOs, industry, organizations of social movements, rigorous regulations of the government, and normative environment of institutions that boost the responsible practices of the business (Campbell, 2006). In that context, the environment of the organisation is considered as one of the significant critical mechanism that shapes the behaviour of corporate and also considers that it provides a leading difference between the practices of corporate reporting. Therefore, the current study investigates the influence of institutional factors (drivers), such as the setting of governance structure and ecological and social development, on the practices of sustainability reporting based on GRI using the institutional theory.

2.1. Governance structure

Notably, the governance structure plays a vital role in improving social performance and promotes the organizations to be accountable and transparent about their initiatives of GRI (Khan et al., 2013). Corporate governance is considered a critical aspect of the tourism industry because intensive competition and customer demands are the significant characteristics of the tourism sector (Yeh & Trejos, 2015). Therefore, effective mechanisms of governance at the level of corporate governance are needed by the companies of tourism to respond to changes in the market (Yeh, 2019). The institutional governance arrangements at the national level impact the state policies of tourism and provide the tools to attain the goals of the procedure (Hall, 2011). Effective governance mechanisms lead the organization toward effectively developing tourism strategies (Scott & Marzano, 2015).

The legislation developed by the government promotes and enhances the practices of GRI by providing encouragement for responsible behavior of corporates and imposing penalties on the irresponsible behaviors of the organization (Brusca et al., 2018). For instance, the nations where high exploitation in the environment, organizations attain a smaller amount of benefits from the practices of ethics because the government in these countries is not able to enhance the responsible behavior of corporates by providing financial support and tax exemptions (Maas et al., 2016). Countries with an effective institutional environment and reliable governance, accountability, and transparency system are attached to the country's general public, and the general public also requires supplementary information from the organizations for effective business processes (Brand et al., 2018).Thus, the edifice of governance shapes the national level environment that influences the reporting practices at the organizational level (Larrán Jorge et al., 2019). In link with hypothetical literature, numerous literature were conducted that provided insights about the severe role of an effective governance system on corporate accountable behavior. Following the tourism industry, Melubo et al. (2019) found the creation of pressure by the local institutions and the presence of regulatory authorities that promote and enforce the practices of GRI. Based on all mentioned empirical outcomes, it is imagined that the organisations domiciled in the countries with an effective system of governance are more engaged in issuing sustainability reports with the implementation of the GRI framework. Therefore, the present study proposes the hypothesis as under:

H1: Tourism enterprises from countries with an effective governance structure will publish more reports on sustainability using GRI guidelines.

2.2. Governance structure, social development

The environmental and social development at the country level imitates how it performs by a country regarding social issues (Wagner, 2010). The overall country's social performance shapes the public's expectations and interests that impact the understanding of appropriate and inappropriate behavior of corporate. In a country with social performance, corporate responsibility includes a broader set of social aspects far from financial issues (Boiral & Heras-Saizarbitoria, 2017).For example, a

civilization is more esteemed by a civilization in developed states because of social obligations and quality of life (i.e., sustainable development, environmental protection, social justice, and income equality).On the other hand, developing states give more importance to survival worries (i.e., economic and physical security). Thus, a nation with comprehensive sustainability performance but irresponsible corporate behavior will harm the organization's financial performance, legitimacy, and image (Basu & Palazzo, 2008). In light of the above discussion, we have made the following hypothesis for social expansion.

H2: The tourism enterprises from the countries with a high level of social expansion will publish more sustainability reports using GRI guidelines.

2.3. Ecological Innovation

The probability of entering ecological movement organizations and NGOs in developed states is higher than in developing states. When essential, these ecological movement organizations and NGOs pressure the organizations to behave environmentally accountable (Hussain et al., 2018).A reliable community view also stresses organizations to match GRI processes with community expectations and desires (Yang & Rivers, 2009).Mainly, when a state performs well in the issues of environmental and social factors, the organization of such a state will engage more in environmentally and socially responsible reporting practices. In the backing of literature, Kumar et al. (2018) exposed the concerns as well as the attention of the general public comprehensively on ecological issues and improved their protagonist at the environmental disclosure level. Concerning the tourism industry, a study by De Grosbois (2016) documented that stakeholders' pressure leads companies toward the differences in the behavior of GRI reporting in the cruise lines industry. In link with empirical outcomes, this study imagines the organization domiciles in states that have comprehensive performance in the matters of ecological environment. Thus, the present study proposes the hypothesis as under:

H3: The tourism enterprises from the countries with a high level of ecological expansion will publish more sustainability reports using GRI guidelines.

3. Research methods

We followed this study's different panel data econometrics methodologies to estimate the model. First, we identified and formulated the data according to the hypothesis discussed in the above section. Secondly, we cleaned and transformed the selected data for better analysis and fruitful results. Thirdly, we developed the panel data models to estimate the model according to its hypothesis. And finally, we empirically analyzed the theoretical model, interpreted the estimated results, and developed the policy for further recommendation. For this purpose, the present study compiled the data about the three factors of the organizational environment, such as environment, social and governance performance, and sector-level macroeconomic control variables such as GDP, exports, and tourism receipts for the year 2011 to 2019. Further, we

analyzed the model with suited panel data techniques, such as pooled OLS, Fix effect, random effect, and Dynamic panel GMM econometrics models.

3.1. Sample

The 'GRI's Sustainability Discloser Database (SDD)' has reported on the sustainability of small, medium, and big tourist firms, including gaming, casinos, recreation services, leisure, tour operators, cruise lines, resort operators, motel and hotel operators, and more. Consequently, this study reported the activities only from 2011 to 2019. This study measured the reporting based on GRI guidelines' performance of states by preparing metrics such as the indicator of the GRI report that revealed the existence of a GRI-based report. Besides, this study also extracted the 'Environmental Performance Index (EPI), Social Progress Index (SPI),' and Worldwide Governance Indicators (WGIs) data. Also, the WGIs were established by Kaufmann and Kraay and extracted from the World Bank database. The WGI was formed by taking six dimensions, such as political stability, control of corruption, regulatory quality, government effectiveness, voice, and accountability; thus, the Governance Index was formed by averaging these six dimensions. Previous studies such as Knudsen (2011); Barakat and Hussainey (2013); and Sovacool and Andrews (2015) also utilized the WGIs in empirical studies. Moreover, SPI was measured by the 'Social Progress Imperative' (2018). Some studies, such as Needles Jr et al. (2016) and Sethi et al. (2017), used SPI in empirical studies. SPI indicates the capability of the culture that satisfies the communities and citizens by providing the necessities of life, sustaining quality lives, and formulating the conditions that allow all individuals to gain their entire potential (Uyar et al., 2019b). Lastly, EPI was formed by Columbia University and Yale University through the help of the World Economic Forum (EPI 2018). Past studies Saisana and Saltelli (2010) and González et al. (2018) also utilized the EPI, as a proxy variable for ecological expansion. This index aims to ensure environmental health and assess the country's commitments to meet the objectives of formulated environment-related policies. The scores ranged are 0 to 100 of all the indices that are used in the study.

World Development Indicators (WDI) database was also mined for information about the scale of the countries' tourist industries, the degree to which they are open to trade, and their overall economic performance. In this study, these variables are used as a control variable because they predicted the tourism industry size and economic size distress the reporting regarding sustainability. Unsuitable and unhealthy economic conditions affect the business's profitability (Halkos & Skouloudis, 2016), reducing the organization's probability of acting responsibly. Therefore, it is expected that the tourism firms in a state with economic development will be much more willing to publish reports regarding sustainability based on GRI guidelines. The size that is the measure of visibility may accommodate the market players that act much more accountable due to stakeholder pressure that may force firms to participate in the socially responsible comportment. Tourism receipts are used to measure tourism industry size and were gathered from the WDI database. Furthermore, trade openness is measured by export activity, and national economy size is measured by the GDP in

Table 1. Measurement of variables.

Variables	Measurements	Source
GRI Indicator	Binary Variable 1 is assigned if the GRI report is Published and 0 if the GRI report is not Published.	GRI SDD Database 2018
Government Index	Percentage rank between all countries from 0 to 100 rank.	Kaufmann and Kraay
Social Index	Percentage rank between all countries from 0 to 100 rank.	SPI (2018).
Environmental Index	Percentage rank between all countries from 0 to 100 rank.	EPI (2018)
GDP	US Dollar	WDI Database (2018)
Exports %	Percentage of GDP	WDI Database (2018)
Tourism Receipts	Receipts (US Dollar)	WDI Database (2018)

Source: Author's Source.

the current study and was gathered from the WDI database that was also used by the previous literature (Cavallo & Frankel, 2008; Jin, 2000).

After cleaning and processing the data, a few countries are dropped, such as Taiwan, Cook Island, Niue, Martinique, French Guiana, and Anguilla, among the 217 countries. In the end, we have just 60 countries due to missing data on tourism receipt economic and sustainability data, and just 157 stated states remained in the final data sample space. And variables' description, Measurement, and data source are discussed in Table 1.

3.2. Statistical model

This study established statistical models for hypotheses testing. It used the GRI indicator (GRIi) (presence) as the predicted variable. While the sustainability indicators such as EPI, SPI, and WGIs were used as predictor variables, the tourism industry's size and economic indicators such as GDP and Exports (EX) were used as control variables. The control variable, such as tourism receipts (TR), EX, and GDP, were transformed by taking the logarithms. In particular, the model of the study is given below:

$$\mathrm{GRIi}_{it} = \beta_0 + \beta_1 \mathrm{WGIs}_{it} + \beta_2 \mathrm{SPI}_{it} + \beta_3 \mathrm{EPI}_{it} + \beta_4 \mathrm{LnGDP}_{it} + \beta_5 LNEX_{it} + \beta_6 \mathrm{LnTR}_{it} \quad (1)$$

3.3. Pooled OLS, fixed, and random effect

This study used panel data, which has both the characteristics of time series and cross-sectional. So, it might have the problem of autocorrelation from time series and endogeneity. Pooled OLS, fix, and random effect methods efficiently deal with the problem of autocorrelation but do not efficiently handle the problem of endogeneity problem. So first of all, we estimate the model by pooled OLS, and after that estimate, the model by fixed and random effect and applied the Hausman test to check the validity of results among both estimators. And the equation becomes like this;

$$\mathrm{GRIi}_{it} = \gamma_0 + \gamma_1 \mathrm{GRL}i_{it,1} + \gamma_2 \mathrm{GRL}i_{it,2} + \gamma_3 \mathrm{WGIS}_{it} + \gamma_4 \mathrm{SPI}_{it} + \gamma_5 \mathrm{EPI}_{it} + \gamma_6 \mathrm{LnGDP}_{it} + \gamma_7 \mathrm{LNEX}_{it} + \gamma_8 \mathrm{LnTR}_{it} \quad (2)$$

Because the equation contains a lagged dependent variable, these three-regression standards indicate that the estimates are not unbiased and consistent due to the problem of autocorrelation and endogeneity. This is because the equation contains the lagging variable. According to (Bond, 2002), in pool OLS, coefficients are biased upwards, and fixed, and random coefficients are biased downward estimation due to those lagged dependent variables being also explanatory variables.

3.4. Dynamic panel generalized method of movement (GMM)

Difference GMM handled autocorrelation and endogeneity by transforming data to solve fixed effects and employing lagged variables as instruments to solve equation endogeneity. Furthermore, the difference GMM is biased when the T is small in the sample, and exogenous variables are highly persistent (Alonso-Borrego & Arellano, 1999). According to the system GMM, which is proposed by Arellano and Bover (1995),Blundell and Bond (1998) resolved the issue of dynamic panel biasness and endogeneity problem in the model. System GMM is more efficient because the first differenced instruments are not correlated with the fixed effect (Roodman, 2009). On the other hand, system GMM is also efficient when the variables are closed to the random walk process as compared to the difference GMM, it is biased with the large sample size (Blundell & Bond, 1998), and it is also biased downward in case of weak instruments (Blundell & Bond, 2000). So, in this study, results of system GMM were incorporated because the OLS and fixed/random effect are biased and insistent estimates, and they cannot handle the fixed and endogeneity problem (Arellano & Bover, 1995; Blundell & Bond, 1998, 2000). It forms the following model specifications:

$$\mathrm{GRIi}_{it} = \theta_1 \mathrm{GRLi}_{it-1} + \theta_2 \mathrm{X}_{it} + \rho_i + \vartheta_t + \in_{it} \tag{3}$$

GRI indicator ($\mathrm{GRI_i}$) index, which is based on the published report published of tourism, θ_1 measures the experience of the people today, X represents all controlled indicators such as sustainability indicators (EPI, SPI, and WGIs), the size of the tourism industry, economic indicants such as GDP and Exports (EX) and θ_2 are the elasticities of the controlled variables, ρ_i is the cross-section effect and ϑ_t is the time effect and $\in_i$ is an error term of the regression.

The first estimation is to estimate the first difference transformation to minimize the cross-section effect from the regression, which the following equation can eliminate;

$$\begin{gathered} \Delta\mathrm{GRIi}_{it} = \theta_1 \Delta\mathrm{GRLi}_{it-1} + \theta_2 \Delta\mathrm{X}_{it} + \Delta\vartheta_t + \Delta \in_{it} \\ for\ i = 1, \ldots\ldots\ldots N \text{ and } t = 3, \ldots\ldots\ldots T \end{gathered} \tag{4}$$

And further, it is assumed that residuals are uncorrelated i.e.;

$$E(\epsilon_{id,} \epsilon_f) = 0 \ for\ d \neq f \tag{5}$$

This is the initial restriction for GRIi as a predetermined.

$$E(GRIi_1 \epsilon_{it}) = 0 \ for\ t \geq 2 \tag{6}$$

Then according to equations 4th and 5th the Arellano and Bond (1991) assumptions 7 and 8;

$$E(GRIi_{it-s}\Delta\epsilon_{it}) = 0 \ for \ t = 3, \ldots\ldots T \text{ and } s \geq 2 \tag{7}$$

$$E(X_{it-s}\Delta\epsilon_{it}) = 0 \ for \ t = 3, \ldots\ldots T \text{ and } s \geq 2 \tag{8}$$

Blundell and Bond (1998) expressed that in the first differenced equation, the lagged level instruments are not valid and inconsistent, and also when the time dimension is small. Further, they suggested using the first differenced instruments instead of level. This takes the equation from the difference GMM to system GMM. That is a combination of the level and difference equation. Hence to eliminate the problem of weak instruments, Blundell and Bond (1998) developed the following condition;

$$E[(GRIi_{it-1}(\rho_i + \epsilon_{it})] = 0 \text{ for } t = 3, \ldots\ldots T \tag{9}$$

$$E[(X_{it-1}(\rho_i + \epsilon_{it})]0 \text{ for } t = 3, \ldots\ldots T \tag{10}$$

4. Findings

Descriptive statistics are presented in Table 2. The average GDI index means the value is 2.94, with a standard deviation of 0.96, and minimum and maximum values of 0.51 and 5.23, meaning most regions belong to the mid-range of data. Moreover, the sustainability indicators such as WGI, EPI, and SPI mean values are 69.92, 66.93, and 4.96, with standard deviations, are 0.97, 0.97, and 0.95, respectively.

The unit root problem of the data is checked first, and the order of integration is tested with the help of a second-generation Pesaran (CADF) unit root test. At this level, Pesaran testing shows that every indicator is stationary. Secondly, the relationship between sustainable indicators and the GRI index is checked by taking the correlation coefficient of Pearson (and its significance level) into consideration along with social indicators, which can be seen in Table 3.

After considering the results of Table 3, one can see that the variables have a large significant correlation. The relationship between environmental and social indices and the linear association between social and governance indices were high. In the statistical methodology, we decided to use explanatory variables one at a time because

Table 2. Descriptive statistics.

Variable	Mean	Std. Dev.	Min	Max
GRI	2.9431	0.9609	0.5163	5.2364
EGI	69.9185	0.9734	66.9162	71.9651
EPI	66.9331	0.9750	64.5766	69.0964
SPI	64.9666	0.9587	62.4704	67.2605
lnGDP	0.5073	0.3525	−1.5934	1.4008
LnEX	1.5449	0.3003	−1.0023	2.3456
LnTR	9.1347	0.9440	5.0000	11.4003

Source: Author's Source.

Table 3. Pearson's correlation coefficients.

Variables	GRI	WGI	SPI	EPI	lnGDP	lnEX	lnTR	Pearson unit root test
GRI index	1							0.0000
WGI	0.7109*	1						0.0000
SPI	0.9328*	0.7758*	1					0.0000
EPI	0.9304*	0.6598*	0.9025*	1				0.0000
lnGDP	−0.0672*	−0.0249	−0.0501	−0.0549	1			0.0000
lnEX	0.1414*	0.1238*	0.1170*	0.1107*	−0.0463	1		0.0000
lnTR	0.1946*	0.1467*	0.1994*	0.1822*	−0.1689*	0.2424*	1	0.0000

Note: * shows 5% significance level.
Source: Author's Source.

there is a high association among them, which can be confirmed with the help of high VIF (Table 4).

The first assumption is multicollinearity, which means the variable is not highly correlated; the following equations can calculate that:

$$R^2_{EPI} WGI_{it} = \alpha_0 + \beta_2 EPI_{it} + \beta_3 SPI_{it} + \beta_4 LNEX_{it} + \beta_5 LNGDP_{it} + \beta_6 LNTR_{it} + e_{it} \tag{11}$$

$$R^2_{EPI} EPI_{it} = \alpha_0 + \beta_2 WGI_{it} + \beta_3 SPI_{it} + \beta_4 LNEX_{it} + \beta_5 LNGDP_{it} + \beta_6 LNTR_{it} + e_{it} \tag{12}$$

$$R^2_{SPI} SPI_{it} = \alpha_0 + \beta_2 EPI_{it} + \beta_3 WGI_{it} + \beta_4 LNEX_{it} + \beta_5 LNGDP_{it} + \beta_6 LNTR_{it} + e_{it} \tag{13}$$

$$R^2_{LNEX} LNEX_{it} = \alpha_0 + \beta_2 EPI_{it} + \beta_3 SPI_{it} + \beta_4 GWI_{it} + \beta_5 LNGDP_{it} + \beta_6 LNTR_{it} + e_{it} \tag{14}$$

$$R^2_{LNGDP} LNGDP_{it} = \alpha_0 + \beta_2 EPI_{it} + \beta_3 SPI_{it} + \beta_4 LNEX_{it} + \beta_5 WGI + \beta_6 LNTR_{it} + e_{it} \tag{15}$$

$$R^2_{LNTR} LNTR_{it} = \alpha_0 + \beta_2 EPI_{it} + \beta_3 SPI_{it} + \beta_4 LNEX_{it} + \beta_5 LNGDP_{it} + \beta_6 GWI_{it} + e_{it} \tag{16}$$

$$j = R^2_{GRI}, \ R^2_{EPI}, \ R^2_{SPI,} R^2_{LNEX,} R^2_{LNGDP,} R^2_{NTR,} \tag{17}$$

$$Tolrance = 1 - R^2_j VIF = \frac{1}{Tolerance} \tag{18}$$

Table 4 presents the variance inflation factor (VIF) that checks the assumption of multicollinearity among the understudy variables. The statistics exposed that the variables are not highly correlated with each other except the SP and EPI because VIF values are less than five of all variables except SPI. EPI has a multicollinearity issue and can be controlled effectively using Driscoll Kraay estimator in the regression.

Table 4. Variance inflation factor.

	VIF	1/VIF
SPI	8.028	.125
EPI	5.476	.183
WGI	2.651	.377
LNTR	1.124	.889
LNEX	1.072	.933
LNGDP	1.03	.971
Mean VIF	3.23	.

Source: Author's Source.

Table 5. Skewness & Kurtosis test.

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj_chi2(2)	Prob > chi2
GRIi	1099	0.0000	0.0000	32.33	0.0000
SPI	1099	0.0000	0.0000	46.21	0.0000
EPI	1099	0.0028	0.0011	17.55	0.0002
WGI	1099	0.0000	0.0945	33.40	0.0000
LNTR	1098	0.0000	0.0271	32.59	0.0000
LNEX	1099	0.0000	0.000	–	0.0000
LNGDP	984	0.0000	0.000	–	0.0000

Source: Author's Source.

The Skewness and Kurtosis test verifies the second assumption regarding normality, and the statistics of the test show that the data has an abnormality problem because the probabilities values are less than 0.05, which rejects the null hypothesis that the data is normal. According to Gujarati and Porter (2011), if the data set is large (more than 100 observations), normality could not affect the results, and this study has 1099 observations. Table 5, given below, shows the statistics of the Skewness and Kurtosis test.

The third and four assumptions of OLS regarding homoscedasticity and autocorrelation are verified by the Breusch-Pagan and Wooldridge tests, respectively. The statistics show that the probabilities values are less than 0.05 in both of the criteria that, reject the null hypotheses about data being homoscedastic and having no autocorrelation, and these issues can be controlled by using a logistic regression estimator in the regression.

4.1. Results of pooled (POLS) and fixed/random effect

The appropriate model is selected using the Hausman test, and statistics show that probability values are more significant than 0.05 and accepting the null hypothesis regarding the fixed effect model is appropriate. The results are given in Table 6.

The above results may be inconsistent due to the endogeneity issues in large panel data; therefore, we move to the dynamic panel GMM model and results are presented in Table 7.

According to Table 6, SPI and EPI sustainable indicators significantly affect GRI. The tourism governance index is the main component of sustainability, which is significant in the model; it might be due to the endogeneity problem, so we will move to dynamic difference GMM. As discussed in the methodology section OLS, fix, and random effect methodologies are downward biased due to the lag of the dependent variable as the exogenous variables and results are not consistent and unbiased. The

Table 6. Pooled OLS, fixed, and random effect estimates.

Variables	Pooled OLS	Fixed	Random effect
GRIi (-1)	0.331(0.029) ***	0.077(0.019) ***	0.331(0.029) ***
GRIi (-2)	0.005(0.025)	−0.014(0.017)	0.005(0.025)
WGI	0.019(0.015)	0.046(0.022) **	0.019(0.015)
SPI	0.286(0.028) ***	0.249(0.033) ***	0.286(0.028) ***
EPI	0.349(0.024) ***	0.445(0.030) ***	0.349(0.024) ***
lnGDP	−0.015(0.022)	0.019(0.016)	−0.015(0.022)
lnEX	0.034(0.034)	−0.089(0.052) *	0.034(0.034)
lnTR	0.005(0.011)	−0.056(0.035) *	0.005(0.011)
C	−41.383(1.485) ***	−45.492(2.593) ***	−41.383(1.485) ***
Hausman Test			
Coefficient	0.44		
Prob.	0.99		

Note: *** indicates 1% and ** significance 5% significance level.
Source: Author's Source.

Table 7. Dynamic panel GMM model.

Variables	Coef.	Std. Err.	Z	Prob.
GRI L1.	0.174***	0.046	3.780	0.000
GRI L2.	0.009	0.016	0.570	0.570
WGI	0.085**	0.029	2.980	0.003
SPI	0.193***	0.043	4.510	0.000
EPI	0.337***	0.041	8.120	0.000
lnGDP	0.032*	0.019	1.670	0.095
lnEX	−0.188***	0.065	−2.880	0.004
lnTR	−0.031	0.040	−0.780	0.434
C	−37.816***	3.287	−11.500	0.000
Model Diagnostics				
Wald test				0.000
Sargan				0.126
AR1				0.005
AR2				0.073

Source: Author's Source.

literature confirmed that dynamic panel difference GMM resolves the problem of fixed effect and endogeneity.

Dynamic panel GMM model is used to tackle the problem of endogeneity, and results show that the model was significant (having p values less than 0.05 and an appropriate Chi-square value). Besides, the results indicate that WGI, EPI, SPI, TR, and GDP have positive nexus with the GRI indicator because coefficients indicate a positive sign. EX has a negative relationship with the GRI indicator because its coefficients are negative. Moreover, WGI, EPI, and SPI have significant nexus with the GRI indicator because p values are less than 0.05 and z values are higher than 1.64. Moreover, TR has insignificant nexus with the GRI indicator because p values are higher than 0.05 and t values are less than 1.64. Table 7 shows the dynamic panel GMM regression. According to Table 6, the estimated regression results are valid because they pass all of the diagnostics tests according to the Wald test, which indicates that the model is significant; the Sargan test shows that all of the instruments are valid, which minimizes the problem of endogeneity and results that are unbiased from the endogeneity; at the first lag, there is the autocorrelation problem, which will be tackled down by using the lags of dependent, and shows that at first lag, there exists the problem of autocorrelation and at the second lag, it is minimized.

The increasing trend has been found in the sustainability reporting in tourism around the globe mentioned in the descriptive statistics. These statistics also

highlighted that the GRI guidelines' adoption rate concerning sustainability reports has increased in tourism (De Grosbois, 2016). Firstly, the findings exposed a significant relationship between governance quality and the tendency of sustainability reporting in the tourism sector globally and accepted the first hypothesis of the article. These results also verify the declaration of previous literature about the quality of governance which is a significant aspect of tourism because of its unique features (Kim et al., 2018).

Secondly, the findings exposed the significant link between social performance and the tendency of reporting regarding sustainability in tourism and accepted the second hypothesis. The outcome also confirms the findings of previous literature; it is also found that social performance is an important area of sustainability reporting along with environmental performance (Sheldon & Park, 2011). Likewise, De Grosbois (2016) proved that the theme of community and social well-being was the second-largest and most discussed theme after an ecological theme. Therefore, this study supported the finding of prior literature in the area of GRI reporting and social performance. Thirdly, the significant nexus between environmental performance and the tendency of sustainability reporting in tourism accepted the third hypothesis. As the previous predictors, environmental performance has a much considerable effect on sustainability reporting in tourism. These outcomes confirm the findings of prior literature that ecological concerns are a significant factor in sustainability reporting in the global tourism business (Girella et al., 2019). Finally, all three indicators of sustainability reporting; governance, environmental and social- significantly influence the tendency of sustainability reporting in tourism. Overall, this study proved that institutional factors substantially affect the trend of sustainability reporting in tourism globally.

5. Conclusion and implications

The study analyzes the effects of institutional factors on adopting sustainability reporting in the worldwide tourism business from 2011 to 2019.It is concluded that all three indicators of sustainability reporting, such as governance, environmental and social, significantly influence the tendency to report sustainability in tourism. Overall, this study confirmed that institutional factors substantially affect the propensity to report sustainability in tourism globally. It provides empirical evidence regarding the institutional theory that offers an understanding of the motivations of sustainability reporting in the tourism industry. This study indicates that industry representatives, civil organizations, and governors must create a more sustainable environment for the tourism industry, such as residence, security, and other facilities. By doing this, tourism organizations can make the tourism industry more attractive. Moreover, the economical friendly environment encourages tourism toward sustainability reporting. Thus, it is recommended that regulators and policy implementer stake adequate measures to shape a sustainable environment for tourist destinations.

This study has a few limitations. Firstly, the findings may not be generalizable other than the tourism industry because the data were taken from the tourism industry. Secondly, the outcomes were evaluated concisely from 2011 to 2019. Thirdly, this

study verifies the sustainability reporting based on reports issued by the GRI, and other database reports are ignored in the study. Fourthly, this study only focuses on three institutional factors, such as governance, environmental and social, and ignores the other factors. Finally, the current research does not focus on the quality and content of the reporting but only focuses on the adoption and quantity of the reporting. Given these limitations, future studies may analyze these standards across countries with multiple reporting indicators. It may also explore the influence of COVID-19 pre and post-effects in the tourism industry and respective reporting standards.

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