SECTION ECONOMICS, BUSINESS ADMINISTRATION, TOURISM AND STATISTICS

WELL-BEING AND SOCIOECONOMIC FACTORS: EVIDENCE FROM THE EUROPEAN UNION

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Abstract: *Since 2013, March 20 has been recognized as World Happiness Day by the United Nations, emphasizing the significance of well-being beyond purely economic considerations. While traditional economic and social indicators provide valuable insights, a comprehensive approach to measuring happiness requires a broader set of socioeconomic variables. However, many existing studies overlook endogeneity issues in panel data analysis. This study addresses this gap by employing a Panel Vector Autoregressive model, which treats all variables as endogenous, allowing for the identification of bidirectional relationships, path dependencies, and potential virtuous circles. Economic factors remain central to well-being, with numerous studies confirming a positive correlation between happiness and GDP per capita. Furthermore, governance quality plays a crucial role, encompassing democratic participation, freedom of expression, government effectiveness, the rule of law, and corruption control, all of which contribute to overall life satisfaction. Beyond economic and governance aspects, environmental sustainability has emerged as a critical determinant of happiness, particularly in developed nations. Climate change and environmental degradation have severe socioeconomic consequences that negatively impact well-being. Additionally, cultural factors such as gender equality, could significantly influence happiness by fostering economic growth and social stability. This study conducts an empirical analysis using panel data from 27 EU countries spanning the years 2011 to 2023, offering new insights into the determinants of well-being and their policy implications. The analysis reveals that both well-being and GDP are path-dependent, with rising GDP contributing to greater happiness. Institutional quality enhances both life satisfaction and economic development, while lower CO_2 emissions similarly exert a positive effect on both outcomes. Institutional quality and environmental factors are closely interlinked: improved governance helps reduce emissions, while increasing emissions can prompt institutional responses. An enhancement in overall life satisfaction—frequently associated with increased job fulfilment and higher productivity—tends to exert a positive influence on average per capita income. Higher gender inequality diminishes happiness. Gender equality is also associated with lower emissions, suggesting that greater female participation supports sustainable development. However, some findings are unexpected: GDP growth does not necessarily lead to reduced emissions or improved institutional quality, and stronger institutions do not directly alleviate gender inequality. These complexities highlight the*

need for further research that accounts for contextual factors, time lags, and sample heterogeneity.

Keywords: *Well-being; Gross Domestic Product; institutional quality; CO_2 emissions; gender inequality.*

JEL Classification: *I30; E71; O1*.

1. Introduction

Since 2013, March 20 has been celebrated as World Happiness Day, established by the UN (United Nations). The aim is to highlight the importance of well-being in individuals' lives, beyond the always-important economic aspects. In addition to the well-known economic and social indicators, there are several other indicators that policymakers can use to measure happiness and guide them in developing social policies. Research on happiness, however, should not rely on a single aggregate indicator, but rather on a set of socioeconomic indicators related to different aspects of life that, when improved, could positively affect well-being.

Although several studies have addressed this topic, many have overlooked the issue of endogeneity in panel data (Paleologou, 2022). This paper aims to fill that gap. To achieve this, the Panel Vector Autoregressive (PVAR) model has been employed, as it treats all variables as endogenous and can identify potential bidirectional relationships (including possible virtuous circles) as well as path dependencies (Marra et al., 2024a; Wang et al., 2022).

Among the primary factors influencing well-being are economic variables. Numerous studies have examined the relationship between happiness and GDP per capita, consistently finding a positive correlation (Tauseef, 2022). Empirical studies provide substantial evidence indicating a significant positive correlation between individuals' overall life satisfaction and their level of job satisfaction, with implications for labour productivity (Weziak-Bialowolska et al., 2020). However, it is important to note that an increase in per capita income does not always lead to a proportional rise in well-being (Easterlin, 1974; Clark et al., 2016). In country-level analyses, this discrepancy may stem from the failure to account for the distribution of wealth within the population.

Numerous empirical studies have established a significant correlation between happiness and various aspects of governance. These include the opportunity for citizens to participate in the selection of their government, as well as the freedoms of expression and association and the presence of an independent and free media; the absence of violence and terrorism, which ensures a stable and secure environment; government effectiveness, referring to the ability to deliver public services efficiently and implement policies effectively; the rule of law and public trust, characterized by confidence in the legal and societal framework, along with lower crime and violence rates; and the absence of corruption, which can lead to inefficiencies and ultimately hinder economic growth. Empirical analyses frequently reveal that countries with high-quality institutions tend to have happier and more satisfied citizens (Youssef and Diab, 2021).

Environmental preservation has increasingly been recognized as a fundamental determinant of societal progress, particularly in the context of developed nations. Given this, it is essential to examine the extent to which well-being is influenced by a healthy environment. The acceleration of climate change, driven by polluting emissions, has led to rising global temperatures and more frequent extreme weather events. These environmental shifts have far-reaching socioeconomic consequences, which are likely to negatively impact overall happiness and life satisfaction (Apergis and Majeed, 2021). Empirical evidence underscores the significant role that environmental factors play in shaping well-being across different countries.

Happiness can be influenced by cultural factors, including gender equality, which is a key objective of the United Nations' Sustainable Development Goals. Notably, gender equality and the protection of women's rights are not only fundamental human rights but also essential prerequisites for achieving broader socioeconomic objectives. Research has highlighted that fostering gender equality contributes to economic growth, environmental sustainability, and overall societal well-being (Colantonio et al., 2022).

The next section presents the empirical analysis conducted on panel data from 27 EU countries spanning the period from 2011 to 2023, revealing noteworthy findings into the socioeconomic determinants of well-being. The final section discusses the conclusions, policy implications, and limitations of the study.

2. Empirical analysis

2.1. Method

The aim of this analysis is to highlight the role that key social factors play in determining well-being and the possible virtuous circles surrounding it, using the longest possible time span (2011–2023) for a panel of 27 EU countries.

We utilize a Panel Vector Autoregressive (PVAR) model, structured around a system of equations in which all variables are considered endogenous. This approach facilitates the examination of complex interrelationships between variables. Additionally, the PVAR model enables the analysis of the impact of an exogenous shock to one variable on another within the system, while holding all other variables constant. This feature allows for the identification of bidirectional dynamic effects and the potential presence of path dependence.

In line with recent literature, we propose a PVAR model based on the variables listed in Table 1.

Table 1: Variables description and sources

Variable	Definition	Source
WB	Happiness score (Life Ladder)	World Happiness Report
GDP	GDP per capita, PPP (constant 2021 international $)	World Bank
WGI	Aggregate indicators of six dimensions of governance	World Bank

Variable	Definition	Source
CO2	Carbon dioxide (CO2) emissions excluding LULUCF per capita (t CO2e/capita)	World Bank
GII	Gender Inequality Index	UNDP

The measurement of well-being in this analysis is derived from the Gallup World Poll and it is represented by the national average response to a standardized life evaluation question. The question, posed in English, is as follows: "Please imagine a ladder with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you, while the bottom represents the worst possible life. On which step of the ladder would you place yourself at this moment?". This metric, commonly known as the Cantril Life Ladder or simply the Life Ladder, serves as a key indicator in our analysis of life satisfaction or happiness across different populations (Behera et al., 2024).

The analysis would be incomplete without a measure of economic well-being. In this regard, we have chosen to include GDP per capita (adjusted for purchasing power parity), a commonly used indicator in similar studies (Chen and Hsu, 2024). An increase in GDP is expected to correspond with a rise in average life satisfaction, although some cross-country studies highlight the existence of the so-called Easterlin Paradox (Easterlin, 1974), which suggests that happiness is unlikely to increase with economic growth over time (Bartolini and Sarracino, 2014).

To measure institutional quality, we follow Amare et al. (2025) and refer to the World Governance Indicator (WGI) introduced by the World Bank. These composite variable aggregates six key dimensions: “Control of Corruption, Government Effectiveness, Political Stability and Absence of Violence, Regulatory Quality, Rule of Law, and Voice and Accountability" (for further details, see Kaufmann and Kraay, 2024).

Living in a healthy environment is widely recognized as a key contributor to well-being. Therefore, this analysis considers carbon dioxide emissions (CO_2), as their increase is expected to raise public awareness of environmental issues (Marra and Colantonio, 2021) and lead to a decline in life satisfaction (Ko et al., 2024).

Finally, we employ the Gender Inequality Index (GII) developed by the United Nations Development Program. It captures gender-based disparities across three key dimensions: reproductive health, empowerment, and labour market participation. It quantifies the extent of inequality between men and women by measuring the loss in potential well-being caused by these disparities (Audette et al., 2019).

The standard PVAR model is defined by the following system of equations, as outlined by Love and Zicchino (2006):

$$X_{it} = f_i + g_t + \Gamma(L)X_{it} + \varepsilon_{it} \quad (1)$$

In this framework, X_{it} represents the vector of stationary variables used in the analysis, f_i captures country-specific fixed effects, g_t accounts for year-specific fixed effects, $\Gamma(L)X_{it}$ denotes a square matrix of polynomials in the lag operator, and ε_{it} represents the stochastic error term (subsequently, d is introduced to signify the first-difference operator).

Table 2 presents the key descriptive statistics.

Table 2: Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
WB	297	6.414	0.754	3.889	7.856
GDP	351	49729.150	21827.660	22293.410	135379.300
WGI	351	0.995	0.483	0.064	1.867
CO2	351	6.917	3.017	2.998	21.395
GII	324	0.986	0.019	0.948	1.033

2.2. Tests

Implementing the PVAR model necessitates the use of stationary variables, as non-stationarity may lead to spurious results. Therefore, the initial step of the analysis involves assessing the stationarity of the variables using first- and second-generation unit root tests. Specifically, two first-generation tests—the Im, Pesaran, and Shin (IPS) test and the Maddala and Wu (MW) test—along with the second-generation Pesaran test, were conducted. Each of these tests operates under the null hypothesis that the series contains a unit root. The findings presented in Table 3 indicate that the variables usually exhibit non-stationarity in level.

Table 3: Stationarity tests at level

Variable	IPS W-t-bar	MW	Pesaran
WB	-2.408***	102.906***	-1.183
GDP	4.715	13.483	2.470
WGI	1.547	37.461	2.382
CO2	1.750	69.284*	-1.047
GII	-1.586*	205.201***	-2.471***

Note: *p < 0.1; **p < 0.05; ***p < 0.01

In such cases, an appropriate approach is to apply the first-difference transformation (Gyimah et al., 2022). The unit root tests were also conducted on the transformed variables. Based on the results presented in Table 4, it can be concluded that all series are integrated of order one (I(1)), indicating that the selected variables become stationary after applying the first-difference transformation.

Table 4: Stationarity tests: first differences

Variable	IPS W-t-bar	MW	Pesaran
dWB	-2.099**	58.594	-2.422***
dGDP	-11.271***	211.483***	0.998
dWGI	-10.812***	114.253***	-2.720***
dCO2	-11.633***	170.581***	-3.300***
dGII	-11.683***	231.955***	-2.626***

Note: *p < 0.1; **p < 0.05; ***p < 0.01

To account for potential cross-sectional interdependencies, four cointegration tests proposed by Westerlund (2007) were conducted. These tests are based on the null

hypothesis of no cointegration, which, as indicated by the results in Table 5, cannot be rejected. Consequently, the selection of first-difference estimates is justified, given that the variables in their level form are both non-stationary and non-cointegrated.

Table 5: Cointegration analysis results

Statistic	Value	p-value
G_τ	-1.191	0.660
G_α	-1.555	0.500
P_τ	-2.767	0.760
P_α	-1.252	0.510

Note: p-value are robust critical values obtained through bootstrapping with 100 replications

To evaluate the potential impact of collinearity and multicollinearity on our analysis, we examined the correlation matrix and calculated the variance inflation factor (VIF). The results, presented in Table 6—where dWB is used as the dependent variable—indicate low correlation values and consistently low mean VIF and individual VIF scores. Therefore, we conclude that collinearity and multicollinearity do not pose a significant concern in this study.

Table 6: Correlation matrix and variance inflation factors

	dWB	dGDP	dWGI	dCO2	dGII
dWB	1.000				
dGDP	0.111	1.000			
dWGI	0.108	0.058	1.000		
dCO2	0.067	0.298	0.012	1.000	
dGII	0.077	0.045	0.025	0.017	1.000
VIF		1.100	1.000	1.100	1.000
mean VIF	1.050				

The final preliminary step in our analysis involves determining the optimal lag length. Econometric literature suggests that commonly used selection criteria include the Moment Akaike Information Criterion (MAIC), the Moment Bayesian Information Criterion (MBIC), and the Moment Hannan-Quinn Information Criterion (MHQIC), all of which are based on maximum likelihood estimation. Following the methodology of Andrews and Lu (2001), the optimal lag length is identified by minimizing the moment model selection criteria—MBIC, MAIC, and MHQIC. Based on the results presented in Table 7, the most appropriate specification for our model is a first-order PVAR.

Table 7: Lag order selection criteria

Lag	MBIC	MAIC	MHQIC
1	-408.891	-100.132	-225.493
2	-309.165	-77.595	-171.616

The use of the first difference transformation allowed to remove the country-specific fixed effects (f_i) in Equation (1). This procedure, however, may introduce so-called Nickell bias (1981) due to the correlation between the first-differenced lag and the first-differenced error term, both of which depend on ε_{it-1}. In this scenario, estimating the model using Ordinary Least Squares (OLS) would lead to biased and inconsistent results (Baltagi, 2008). To address this issue, we employed forward mean-differencing, also known as the Helmert transformation (Ht) (Arellano and Bover, 1995; Love and Zicchino, 2006) to overcome this problem. Notably, applying the Ht to the raw data yields the same outcome as applying Ht to demeaned data, ensuring the removal of year fixed effects g_t in Equation (1). Consequently, the model can be estimated using the Generalized Method of Moments (GMM), with lagged values of the regressors serving as instruments.

2.3. Results and discussion

The first order PVAR results are shown in Table 8.

Table 8: Estimation results of the PVAR model

		Dependent variables				
		dWB	**dGDP**	**dWGI**	**dCO2**	**dGII**
Lagged independent variables	**dWB**	0.936***	14.528***	-0.158***	0.611***	0.011***
	dGDP	0.000***	0.704***	-0.000***	-0.000	-0.000**
	dWGI	0.513***	16.725***	-0.475***	-1.040**	0.023***
	dCO2	-0.099***	-5.356***	0.158***	-0.075	-0.002***
	dGII	-13.510***	56.849	1898.000	14.370**	-0.145***

Note: *p < 0.1; **p < 0.05; ***p < 0.01

Focusing on the first column, we can highlight that the variable related to life satisfaction exhibits path dependence. Notably, an increase in GDP leads to greater well-being, aligning with much of the existing literature (Agrawal et al., 2023). Therefore, the Easterlin paradox is not observed in this analysis. Furthermore, an improvement in institutional quality, represented by positive variations in the WGI composite index, has a positive impact on happiness, consistent with previous research on the subject (Li and An, 2020). A rise in life satisfaction, as measured by the Ladder index, is also recorded following a reduction in CO_2 emissions—an indicator of both a healthier ecosystem and public awareness of environmental issues (Ko et al., 2024). Finally, an increase (i.e., a worsening) in the Gender Inequality Index appears to have a negative effect on the population's average happiness. However, GII, which has not shown path dependence over time, summarizes a relatively new cultural topic that deserves further analysis.

The analysis of the second column reveals interesting virtuous circles, with GDP as the dependent variable exhibiting path dependence. An increase in happiness, often accompanied by greater job satisfaction and higher labour productivity, appears to have a positive effect on average per capita wealth, aligning with recent studies (Nazneen and Sgroi, 2023). As expected, an improvement in institutional quality positively influences economic growth. Enhancing corruption control, governmental efficacy,

political stability and the absence of violence, regulatory quality, adherence to the rule of law, and civic participation inevitably yields positive economic and financial repercussions (Fengju and Wubishet, 2024; Basnayake et al., 2025). A reduction in CO_2 emissions, moreover, has a positive impact on GDP. Presumably, the transition to cleaner and more energy-efficient technologies is beginning to yield benefits in both environmental and economic terms (Marra et al., 2024b). Finally, the GII does not exhibit any significant effects on GDP.

From the analysis of the remaining columns, other interesting, expected relationships emerge. An increase in CO2 appears to contribute to an improvement in institutional quality, as environmental issues in recent years have increasingly prompted institutions to respond with appropriate policies (Marra and Colantonio, 2023). The inverse relationship is also expected: an improvement in the governance index WGI leads to a reduction in polluting emissions. Additionally, a variation in the GII is accompanied by a variation of the same sign in CO2. Specifically, a reduction in the gender gap and greater involvement of women, particularly in the workplace, seem to promote progress toward sustainable development (Colantonio et al., 2022). Finally, an increase in GDP per capita may help reduce gender inequality.

Some relationships, however, do not exhibit the expected sign. Specifically, an increase in per capita wealth is not associated with a reduction in polluting emissions. A possible explanation for this phenomenon lies in the rise in energy demand that accompanies greater wealth. Historically, this demand has been met primarily through fossil fuels, contributing to environmental degradation (Marra and Colantonio, 2022). Similarly, an increase in GDP does not have a positive impact on institutional quality, which, in turn, does not demonstrate path dependence. Lastly, an improvement in institutional quality does not appear to have a positive effect on reducing gender inequality. Again, potential explanations for these counterintuitive findings may stem from the heterogeneity of the sample, variations in the time lag associated with the manifestation of effects, and other contextual factors.

The stability of the PVAR model was assessed, revealing that the eigenvalues are all strictly less than 1 (Lutkepohl, 2005), as highlighted in Table 9. This stability ensures that the PVAR model is invertible, thereby enabling bidirectional interpretations, as well as the estimation of impulse-response functions and the analysis of variance decomposition (Abrigo and Love, 2016). Furthermore, the over-identification restriction test (Hansen's J chi-squared) yielded a value of 106,962 (p-value = 0,299), which supports the model's goodness-of-fit. This result confirms that the null hypothesis—that the over-identification restrictions are valid—holds true. In other words, the included instrumental variables are both valid and uncorrelated with the error term, while the excluded instruments are correctly omitted.

Table 9: Eigenvalue stability condition

Real	Imaginary	Modulus
0.966	0.000	0.966
0.157	-0.497	0.521
0.157	0.497	0.521
-0.167	-0.261	0.310

Real	Imaginary	Modulus
-0.167	0.261	0.310

Moreover, the Granger causality tests, which examine the null hypothesis of no causality, indicate bidirectional causality and confirm the existence of endogeneity (see Table 10).

Table 10: Granger causality test

Equation Variable	Excluded Variables	Chi2	p-value
dWB	dGDP	10.533	0.001
	dWGI	9.951	0.002
	dCO2	48.496	0.000
	dGII	23.570	0.000
	ALL	78.298	0.000
dGDP	dWB	31.368	0.000
	dWGI	13.061	0.000
	dCO2	49.852	0.000
	dGII	0.943	0.332
	ALL	93.807	0.000
dWGI	dWB	8.090	0.004
	dGDP	39.494	0.000
	dCO2	61.335	0.000
	dGII	1.616	0.204
	ALL	67.179	0.000
dCO2	dWB	15.110	0.000
	dGDP	0.226	0.634
	dWGI	6.229	0.013
	dGII	4.691	0.030
	ALL	28.520	0.000
dGII	dWB	23.269	0.000
	dGDP	5.012	0.025
	dWGI	21.142	0.000
	dCO2	16.059	0.000
	ALL	88.820	0.000

Table 11 presents the variance decomposition, derived through the Cholesky decomposition method using 1,000 Monte Carlo simulations over 10 periods. This analysis measures the proportion of a variable's variation explained by shocks to another variable across time. The main findings indicate that each variable is primarily influenced by its own lag. Notably, a shock to happiness, often accompanied by higher job satisfaction and increased labour productivity, appears to have a significant effect on average per capita wealth.

Table 11: Variance decomposition analysis

		Impulse Variable				
		dWB	**dGDP**	**dWGI**	**dCO2**	**dGII**
Response variable	**dWB**	81.174%	0.856%	1.721%	9.027%	7.222%
	dGDP	43.104%	30.811%	2.459%	20.593%	3.034%
	dWGI	30.999%	16.732%	21.018%	29.642%	1.609%
	dCO2	8.803%	6.439%	4.448%	78.713%	1.596%
	dGII	4.820%	21.029%	6.422%	16.425%	51.303%

Note: Variation in response variable explained by the impulse variables in the columns (10 periods ahead)

Each impulse response function presented in Figure 1 illustrates the reaction of one variable to a one standard deviation shock applied to another variable, while holding all other shocks constant at zero. The impulse response functions were estimated using a Gaussian approximation based on 200 Monte Carlo simulations, employing the Cholesky decomposition method. Upon the application of a shock to a variable in the current period, the response variable typically exhibits a notable reaction in the initial years, followed by a slight fluctuation in subsequent periods.

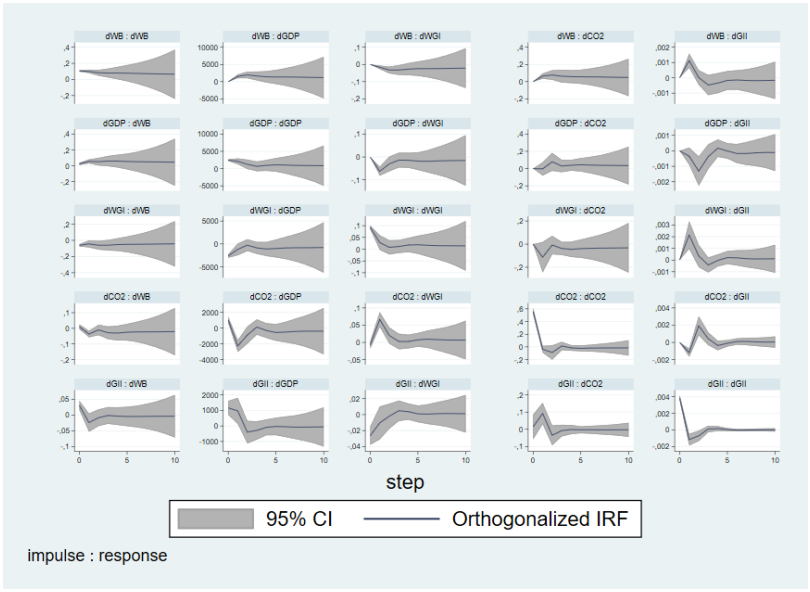

Figure 1: Impulse Response Analysis

3. Conclusions

The paper has explored the interdependencies among well-being, economic growth, institutional quality, environmental factors and gender inequality, using panel data from 27 EU countries from 2011 to 2023.

The analysis highlighted the path dependence of life satisfaction and GDP, with an increase in GDP positively influencing well-being, contrary to the Easterlin paradox. Policymakers could therefore prioritize economic growth as a means to improve overall life satisfaction, recognizing that increases in GDP may lead to better outcomes in terms of people's well-being. Policies might focus on sectors that contribute to economic growth, such as technology, infrastructure, education, and healthcare, which in turn would contribute to a higher quality of life. If certain market failures or inefficiencies are inhibiting the relationship between GDP and well-being, policymakers could intervene through targeted reforms, like addressing unemployment, ensuring fair wages, or improving access to essential services.

Institutional quality improvements, measured by the WGI index, enhance both well-being and economic growth. Policymakers should focus on improving the quality of institutions, such as enhancing rule of law, reducing corruption, and increasing government transparency. Stronger institutions can create a stable environment conducive to both economic growth and higher levels of well-being. Strengthening legal systems and regulatory frameworks can increase trust in public institutions and create more favorable conditions for businesses, leading to economic growth. This, in turn, can contribute to higher life satisfaction by fostering fairer, more predictable environments for individuals and organizations.

Additionally, reducing CO_2 emissions contributes to higher life satisfaction and GDP, likely due to the transition to cleaner and more efficient technologies. Policymakers could prioritize the development of green industries and technologies that reduce CO_2 emissions while driving economic growth. This could include investing in renewable energy (solar, wind, etc.), energy efficiency, and sustainable manufacturing processes. Green economic growth can lead to new jobs, innovation, and higher living standards, contributing to both GDP and well-being.

An enhancement in happiness, frequently correlated with higher job satisfaction and increased labour productivity, seems to exert a positive influence on the average per capita wealth. Policymakers should encourage the development of policies that improve job satisfaction, such as fair wages, better work-life balance, and positive workplace environments. By fostering higher job satisfaction, individuals' happiness could increase, which may, in turn, have a positive impact on economic outcomes. Policies aimed at enhancing job satisfaction can increase employee motivation and productivity. Governments could introduce initiatives that support employee engagement programs, skill development, and career growth opportunities, which would not only increase happiness but also contribute to higher productivity and economic performance.

Further findings reveal that institutional quality and environmental factors are interconnected: governance improvements reduce CO_2 emissions, while increasing emissions prompt institutional responses. Policymakers should focus on improving the quality of governance, including strengthening institutions that regulate and monitor environmental standards. Good governance—through transparent, accountable, and efficient institutions—can foster policies that effectively reduce CO_2 emissions. Investing in institutions that manage natural resources, environmental laws, and climate change mitigation efforts could lead to stronger environmental outcomes. The interconnectedness of governance and environmental factors calls for coordinated efforts between different sectors of government, such economy, environment, health,

and infrastructure. Integrated policymaking can help address the root causes of emissions while ensuring that policies align with broader economic and social objectives.

A worsening Gender Inequality Index (GII) appears to negatively impact happiness. Notably, gender equality advancements correlate with lower emissions, suggesting that female participation fosters sustainable development. Policymakers could prioritize gender equality within environmental and sustainability policies. Recognizing that female participation can contribute to lower emissions, governments could ensure that women have equal access to decision-making roles in environmental policy development and implementation. Policies could focus on increasing female representation in sectors related to sustainability, such as renewable energy, sustainable agriculture, and green technology. Gender-inclusive policies could help drive more sustainable practices.

However, certain relationships deviate from expectations. GII does not significantly affect GDP. Higher GDP does not necessarily reduce emissions or improve institutional quality, likely due to increased energy demand and complex governance dynamics. Similarly, better institutions do not directly mitigate gender inequality. These counterintuitive results highlight the need for further research to account for contextual factors, time lags, and sample heterogeneity in assessing these complex relationships. The current model may not fully capture the complexity of the factors influencing the outcomes under investigation, as it primarily focuses on a limited set of variables, excluding others such as informal institutions, human capital, and social capital. Furthermore, alternative econometric models could be tested, or the analysis could be conducted on different groups of countries to assess the robustness of the results.

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