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The relationship between corruption, happiness, and human development

ABSTRACT

Corruption is widely recognised as one of the most critical social diseases, undermining solidarity, the effectiveness of market incentives, innovation and thus, growth. In a panel study covering 151 countries over ten years from 2012-2021, we seek to find out whether corruption harms happiness when controlling for Human Development, real and nominal GDP per capita.

In our panel tests, we found a somewhat surprising result: no significant statistical relationship between corruption and happiness showed when including the control variables. We also conducted robustness checks to confirm these results, leading to the same conclusion. The relationships between happiness and the control variables were all significant and of the expected sign, suggesting that they could absorb the unwanted effects of corruption.

INTRODUCTION

Nowadays, it is undeniable that political and economic systems and people's happiness are inextricably linked, and research within those connections is crucial. This is a timely issue, as population well-being and prosperity have become significant concerns in the twenty-first century, and these systems can significantly contribute to people's overall happiness.

Corruption

Corruption is a major issue today and is not a new phenomenon, as it has been visible in almost every country. We can find it at all levels of society and all aspects of life. It can take many forms and degrees at any stage of economic development and sheds a serious shade over various political systems. It is an illicit and illegal activity that harms society by undermining democracy and leads to increasing inequalities. The seriousness of the problem is reflected in the fact that combating corruption is one of the United Nations' Sustainable Development Goals (SDGs) for 2030 and that significant efforts are required to reduce it (UN (2019).

Corruption harms society and the economy by weakening trust, eroding democracy, hindering economic development through rent-seeking behaviour, widening inequality, poverty, and social division, and aggravating the environmental crisis. The term corruption, derived from the Latin *corrumpere*, primarily refers to the transition from functional to non-functional, functional to dysfunctional, or good to bad. Organisational corruption is „the abuse or misuse of power or trust for self-interest rather than for the purpose for which the power or trust was granted” (Abländer, M. S. et al 2017).

Corruption is more than the abuse of entrusted power for private gain (Transparency International, 2022), or, in other words, the abuse of public office for personal gain, according to the joint IMF/World Bank definition of corruption. (IMF 2019) Per these definitions, an act can be corrupt even if it does not result in financial gain for the public official.

There are two types of corruption: business corruption and government corruption, in which firms (businesses) or public officials (government) abuse their power to gain benefits while ignoring laws and regulations (Amir, E et al 2019, Afonso, O. 2022).

Corruption can occur in various scenarios, including business, government, the court system, the media, health, education, and even sports. To make corrupt activities appear clean, the processes are always invisible, facilitated by bankers, lawyers, accountants, real estate agents, anonymous front companies, and opaque financial systems. Nonetheless, corruption adapts quickly to macroenvironment changes, such as legislation and technology shifts (Transparency International (2022).

Transparency International (TI) is a non-profit organisation that works to eradicate corruption in over 100 countries worldwide. They seek to hold those in power accountable for the common good through campaigns and research, as well as to promote their interests. They expose the networks and systems that enable corruption in this work and call for greater transparency and integrity in all aspects of public life. Their mission is to combat corruption while fostering accountability and transparency in society. Their vision envisages a world free of corruption in politics, business, civil society, government, and, ultimately, people's daily lives. A world free of corruption is not a sufficient ultimate goal for the organisation, as social and economic justice, human rights, peace, and security are all areas where significant efforts must be undertaken to attain these objectives (Transparency International (2022).

Happiness

Nowadays, measuring aspects that directly impact people's well-being but are not included in traditional economic measurements is becoming increasingly relevant. Happiness is one such factor; the higher its presence, the better and more valued people's lives. People's happiness and good emotions can influence daily life and business facets, ultimately affecting the nation's performance. As a result, people's happiness is not a trivial matter.

According to the World Happiness Report, which the United Nations govern, people's happiness is the fundamental measure of progress. At the OECD's request, almost all member nations now collect data on their citizens' happiness on a yearly basis. The European Union, for example, encourages its member countries to prioritise well-being in economic planning (Helliwell, J. F et al 2012, Helliwell, J. F et al 2022).

Human Development

Many countries employed GDP as a metric of national progress in the second half of the twentieth century, but it was a poor predictor of people's well-being. In the 1970s and 1980s, the concept that there was a need for an indicator that went beyond GDP and could indicate employment, redistribution, and people's basic needs emerged (UNDP (2022).

Mahbub ul Haq devised the human development approach. The Human Development Report, funded by the United Nations Development Programme (UNDP), launched the story of this new composite indicator of socioeconomic development in 1989. In 1990, the first Human Development Report was released, resulting in a fundamentally new approach to enhancing human well-being. The Human Development Index was created to capture the richness of human life rather than the richness of the economy by considering not only economic growth when assessing countries but also people, their opportunities, and their choices (UNDP (2022)).

MATERIAL AND METHOD

The primary research is reflected by three indices based on the studies processed: the CPI, the Happiness Index, and the HDI.

Corruption Perceptions Index (CPI)

Transparency International's Corruption Perceptions Index (CPI) is a global corruption ranking. It measures the extent of corruption in a country's public sector based on expert and business perceptions. The CPI has two main components: the score and the ranking. A country's score is displayed on a scale of 0-100, with 0 indicating a high degree of corruption and 100 representing a high level of purity in the perception of public sector corruption. The rating measures a country's position in reference to other countries and varies depending on the number of countries evaluated. In conclusion, the score, not the ranking, is relevant for research and comparison. Since the methodology for calculating the CPI changed in 2012, only data from 2012 onwards may be compared (Transparency International (2022)).

Happiness Index

The Happiness Index is published on the World Happiness Report's website and has provided happiness reports since 2012, which is the next critical element. The happiness index, which is calculated using the Cantril ladder, indicates the subjective well-being of a country's population. According to the respondents, the best life would be a 10, with the worst being a 0. This demonstrates that the happiness index has a scale of 0 to 10, further weighted to ensure representativeness (Helliwell et al. (2022)).

Human Development Index (HDI)

The Human Development Index (HDI) is a composite index that estimates the average of fundamental aspects of human development. It is the geometric mean of three normalised index values: a long and healthy life (health), knowledge (education), and a decent standard of living. The health dimension represents life expectancy at birth. The education component includes the average years of schooling for adults aged 25 and up and the number of years of education projected for school-age children. The GNI per capita (PPP) indicator measures living standards. However, because the HDI is a simple indicator, it does not account for aspects of human development such as inequality, poverty, security, etc. (UNDP (2022), (Fenyves, V. et al 2018))

The analysis also requires GDP per capita data in both current prices (nominal) and real values, evaluated in purchasing power parity (PPP) in international dollars compared to 2017. These figures can be found in the World Bank's World Development Indicators da-

tabase. As previously said, statistics were obtained for each country from 2012 through 2021 (The World Bank (2022)).

The R 4.2.1 and 4.2.2 versions were implemented to clean the data (Wickham H, Bryan J (2022)). Furthermore, the variables were logarithmised to be treated as continuous variables in future econometric analysis.

The tests were then carried out using the Stata 17.0 software. Based on the literature, a panel regression analysis was conducted, employing an OLS estimator function with a minimum sum of squares of the variances of the error components.

It is then determined whether the pooled regression, random-effects model or fixed-effects model provides a better fit to the data. A Breusch-Pagan test was used to evaluate whether the effect was pooled or random, and a Sargan-Hansen test was used to separate the random effect from the fixed effect setup.

RESULTS AND DISCUSSION

The Relationship Between Happiness, Human Development and Corruption

The first regression was to examine the connection between happiness, human development, and corruption, which takes the following form:

$$\ln \text{Happiness score}_{i,t} = \beta_0 + \beta_1 * \ln \text{HDI score}_{i,t} + \beta_2 * \ln \text{CPI score}_{i,t} + \alpha_i + u_{i,t}$$

where *Happiness score* is the dependent variable and represents the Happiness Index; *i* is the number of observed or cross-sectional units, and *t* is the time variable or proxy variable of years. The constant β_0 is the value of the dependent variable at which the value of the independent variables is 0, and β_1 and β_2 are the partial regression coefficients. In addition, the *HDI score* reflects the Human Development Index, whereas the *CPI score* indicates the Corruption Perceptions Index. Finally, α indicates the time-invariant unobserved effects, while *u* represents the error term (Wooldridge, J. M. (2019)).

First, the Breusch-Pagan test was used to determine whether the data fit better with the pooled or random effect models. The estimated test statistic rejected the null hypothesis that the variance of the unobserved effects is zero, i.e. that homoskedasticity exists or that the residuals are equally distributed, based on the results. Consequently, the alternative hypothesis was opted for, favouring the random-effects model over the pooled model (Gujarati, D. et al 2008, Awan, R. U. et al 2018, Wooldridge 2019).

The Sargan-Hansen test was then utilised to distinguish between the random-effects and fixed-effects models. The null hypothesis was rejected, that the unobserved effects and regressors are uncorrelated. The test indicated that the fixed effect model's results should be considered at a 95% confidence level (Schaffer, M. E. et al 2006).

The fixed-effects model was estimated, with robust standard errors, based on the findings of the Breusch-Pagan and Sargan-Hansen tests, thereby avoiding the problem of heteroskedasticity. In the case of within-group fixed-effects regression, the units of observation are pooled, but in each case, the variables are expressed as deviations from the mean, so a mean-corrected OLS regression was performed. As a result of data gaps discovered during data cleaning, the number of observation units has been reduced from 1550 to 1308, and the number of nations (groups) has been reduced from 155 to 151.

Table 1: Fixed-effect regression model to examine the relationship between happiness, HDI and CPI

. xtset country_SA year

Panel variable: country_SA (unbalanced)

Time variable: year, 2012 to 2021, but with gaps

Delta: 1 unit

. xtreg ln happiness_score ln hdi_score ln cpi_score, fe vce(robust)

Fixed-effects (within) regression

Number of obs = 1,308

Group variable: country_SA

Number of groups = 151

R-squared:

Obs per group:

Within = 0.0427

min = 1

Between = 0.6790

avg = 8.7

Overall = 0.5687

max = 10

corr(u_i, Xb) = -0.3346

F(2,150) = 4.84

Prob > F = 0.0092

(Std. err. adjusted for 151 clusters in country_SA)

ln happiness~e	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]	
ln hdi_score	.9201217	.2998751	3.07	0.003	.3275969	1.512647
ln cpi_score	-.0209771	.0697599	-0.30	0.764	-.158816	.1168618
_cons	2.064563	.2704398	7.63	0.000	1.530199	2.598926
sigma_u	.12383799					
sigma_e	.08227061					
rho	.69379472	(fraction of variance due to u_i)				

Source: Author's calculations

The F-value (4.84) has a p-value of 0.0092. The model is significant at the 1% level, which means that the independent variables consistently predict the dependent variable and that the collection of independent variables has a statistically significant association with the dependent variable. As a result, the model is considered significant in this form (Wooldridge 2019).

The overall R-squared value is 0.5687, demonstrating that the independent variables explain 56.87% of the variance in the dependent variable, i.e. human development and corruption explain 56.87% of the variance in happiness scores. This value measures the overall strength of the relationship but does not reflect how closely an independent variable is related to the dependent variable (Wooldridge 2019).

To test the HDI, the value of $P>|t|$ is needed, where H_0 indicates that the coefficient (parameter) is zero, i.e. $\beta = 0$. Since the result is 0.003, H_0 was rejected, and the alternative hypothesis that $\beta \neq 0$ was accepted. As a result, the HDI is significant at the 1% level, and the coefficient's value may be tested (Wooldridge 2019).

The coefficient value is 0.92, which implies that if the value of HDI increases by 1%, the value of happiness increases by 0.92%, indicating a strong connection. As a result, the HDI contributes to happiness by increasing the dimensions of living standards, education, and health at the same time. H_1 (that there is a positive relationship between human development and happiness) is thus supported.

In the case of corruption, $P>|t|$ is 0.764, indicating that it is insignificant.

Table 2: Fixed-effect regression model to examine the relationship between happiness, CPI and real GDP per capita

```
. xtreg ln happiness score lngdp per capita ppp constant lncpi score, fe vce(robust)
```

Fixed-effects (within) regression
Group variable: country_SA

```
Number of obs      =    1,308
Number of groups   =     151
```

R-squared:

```
Within    = 0.0869
Between   = 0.7042
Overall   = 0.6052
```

Obs per group:

```
min = 1
avg = 8.7
max = 10
```

$$\text{corr}(u_i, Xb) = -0.8304$$

F(2,150)	=	7.31
Prob > F	=	0.0009

(Std. err. adjusted for 151 clusters in country SA)

lnhappiness_score	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]	
lngdp_per_capita_ppp_constant	.3112588	.0847492	3.67	0.000	.1438024	.4787151
lnapi_score	-.0583883	.0625303	-0.93	0.352	-.1819423	.0651657
_cons	-1.044821	.8425284	-1.24	0.217	-2.709578	.6199349
sigma_u	.20670199					
sigma_e	.08034663					
rho	.86873909	(fraction of variance due to u_i)				

Source: Author's calculations

nificant. Based on the model and the results, corruption does not affect happiness; hence hypothesis H₂, that there is a negative direct relationship between corruption and happiness, cannot be supported or accepted.

The Relationship Between Happiness, Real GDP per capita and Corruption

The second regression used a fixed robust model to examine the connection between happiness, corruption, and real GDP per capita. As a result, HDI was removed from this model because it already incorporated income data:

$$\begin{aligned} & \ln \text{Happiness score}_{i,t} \\ &= \beta_0 + \beta_1 * \ln \text{GDP per capita PPP constant}_{i,t} + \beta_2 * \ln \text{CPI score}_{i,t} \\ & \quad + \alpha_i + u_{i,t} \end{aligned}$$

where *Happiness score* is the dependent variable and represents the Happiness Index; i is the number of observed or cross-sectional units, and t is the time variable or proxy variable of years. The constant β_0 is the value of the dependent variable at which the value of the independent variables is 0; and β_1 and β_2 are the partial regression coefficients. In addition, the *GDP per capita PPP constant* reflects the real GDP per capita, whereas the *CPI score* indicates the Corruption Perceptions Index. Finally, α indicates the time-invariant unobserved effects, while u represents the error term (Wooldridge 2019).

According to the F statistic, this model was also significant, and corruption and real GDP per capita explained 60.52% of the variance in happiness scores. At 1%, real GDP per capita was significant. If real GDP per capita increases by 1%, happiness improves by 0.31%, indicating a considerable link. H_3 (that there is a positive relationship between real GDP per capita and happiness) is thus supported. However, the impact of corruption was also insignificant; hence hypothesis H_1 cannot be supported or accepted.

The Relationship Between Happiness, Nominal GDP per capita and Corruption

Finally, in the third regression, the connection between happiness, corruption, and nominal GDP per capita was investigated:

$$\begin{aligned} \ln Happiness\ score_{i,t} \\ = \beta_0 + \beta_1 * \ln GDP\ per\ capita\ PPP\ current_{i,t} + \beta_2 * \ln CPI\ score_{i,t} \\ + \alpha_i + u_{i,t} \end{aligned}$$

where *Happiness score* is the dependent variable and represents the Happiness Index; i is the number of observed or cross-sectional units, and t is the time variable or proxy variable of years. The constant β_0 is the value of the dependent variable at which the value of the independent variables is 0; and β_1 and β_2 are the partial regression coefficients. In addition, the *GDP per capita PPP current* reflects the nominal GDP per capita, whereas the *CPI score* indicates the Corruption Perceptions Index. Finally, α indicates the time-in-

Table 3: Fixed-effect regression model to examine the relationship between happiness, CPI and nominal GDP per capita

```
. xtreg ln happiness_score lngdp_per_capita_ppp_current_int lncpi_score, fe vce(robust)
```

Fixed-effects (within) regression
Group variable: country_SA

Number of obs = 1,308
Number of groups = 151

R-squared:

Within = 0.0753
Between = 0.6983
Overall = 0.6020

Obs per group:

min = 1
avg = 8.7
max = 10

corr(u_i, Xb) = -0.2540

F(2,150) = 11.86
Prob > F = 0.0000

(Std. err. adjusted for 151 clusters in country_SA)

lnhappiness_score	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]	
lngdp_per_capita_ppp_current_int	.181324	.0382023	4.75	0.000	.1058399	.2568081
lncpi_score	-.0313398	.0662503	-0.47	0.637	-.1622441	.0995646
_cons	.0847693	.4624119	0.18	0.855	-.828913	.9984515
sigma_u	.11756471					
sigma_e	.08085805					
rho	.67887086	(fraction of variance due to u_i)				

Source: Author's calculations

variant unobserved effects, while u represents the error term (Wooldridge 2019).

According to the model, corruption and nominal GDP per capita explained 60.20% of the variance in happiness scores. At the 1% level, nominal GDP per capita was significant. A 1% growth in nominal GDP per capita results in a 0.18% increase in happiness. Therefore, nominal GDP per capita contributes to happiness but not as much as real GDP per capita or HDI. H_4 (that there is a positive relationship between nominal GDP per capita and happiness) is thus supported. The impact of corruption remained insignificant; hence hypothesis H_2 cannot be supported or accepted.

ROBUSTNESS CHECKS

To verify the robustness of our results, we also tested them against another commonly used corruption index. The obvious choice, given the study period and the large number of countries observed, was the World Bank's Worldwide Governance Indicator, with its specific sub-index, Control of Corruption. The Control of Corruption sub-index is scaled between -2.5 and +2.5. For logarithmicity, a simple additive transformation was used to transform the variable to values between 1 and 6, being aware of the potential drawbacks of this operation (Bellégo et al. 2022). Tables 4-6 demonstrate the results when the Control of Corruption Index (CCI) replaces CPI, demonstrating the robustness of our results. After running the Breusch-Pagan and the Sargan-Hansen test, the optimal models resulted again

in a fixed effect panel setup using the OLS estimator with clustered standard errors.

The robustness tests confirm our previous results. By replacing CPI with the CCI indicator, the significant estimates of the models are very similar, with only subtle changes in the coefficients and confidence intervals of the significant variables.

CONCLUSIONS

Money, without a doubt, make people happy, but it is critical to consider the multidimensionality of development, which is more likely to enhance people's happiness. Human development measures a country's standard of living and people's education and health.

The findings also show that to improve a nation's happiness, governments should consider more than just the material well-being of their citizens when making decisions. The quantity of money spent on education and health should also be prioritised. The modernisation of education systems will have a favourable impact at the national level. The results show the expected difference in the strength of the relationship between happiness and the nominal and real GDP per capita, respectively.

When controlling for HDI, nominal and real GDP per capita, we could not find a significant relationship between corruption and happiness. One explanation is that the control variables absorbed the effects of corruption. The results show the expected difference in the

Table 4: Fixed-effect regression model to examine the relationship between happiness, HDI and CCI

Fixed-effects (within) regression	Number of obs	=	1,308
Group variable: country_SA	Number of groups	=	151
R-squared:	Obs per group:		
Within = 0.0514	min =		1
Between = 0.7039	avg =		8.7
Overall = 0.5976	max =		10
	F(2,150)	=	4.79
corr(u_i, Xb) = -0.5525	Prob > F	=	0.0096

(Std. err. adjusted for 151 clusters in country_SA)

Inhappiness_score	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]	
Inhdi_score	.8603733	.2990968	2.88	0.005	.2693863	1.45136
pslngdi_controfcrr	.2093543	.1274116	1.64	0.102	-.042399	.4611076
_cons	1.71425	.1670591	10.26	0.000	1.384157	2.044343
sigma_u	.13458239					
sigma_e	.08189356					
rho	.72978112	(fraction of variance due to u_i)				

Source: Author's calculations

Table 5: Fixed-effect regression model to examine the relationship between happiness, CCI and real GDP per capita

Fixed-effects (within) regression	Number of obs	=	1,308
Group variable: country_SA	Number of groups	=	151
R-squared:	Obs per group:		
Within = 0.0895	min =		1
Between = 0.7181	avg =		8.7
Overall = 0.6168	max =		10
	F(2,150)	=	6.06
corr(u_i, Xb) = -0.8668	Prob > F	=	0.0029

(Std. err. adjusted for 151 clusters in country_SA)

Inhappiness_score	Coefficient	Robust std. err.	t	P> t	[95% conf. interval]	
lngdp_per_capita_ppp_constant	.2875083	.0835865	3.44	0.001	.1223493	.4526673
pslngdi_controfcrr	.1567413	.1138918	1.38	0.171	-.0682981	.3817807
_cons	-1.226031	.8358725	-1.47	0.145	-2.877636	.4255735
sigma_u	.22419014					
sigma_e	.0802324					
rho	.88646537	(fraction of variance due to u_i)				

Source: Author's calculations

Table 6: Fixed-effect regression model to examine the relationship between happiness, CCI and nominal GDP per capita

Fixed-effects (within) regression	Number of obs	=	1,308
Group variable: country_SA	Number of groups	=	151
R-squared:	Obs per group:		
Within = 0.0810	min =		1
Between = 0.7119	avg =		8.7
Overall = 0.6141	max =		10
	F(2,150)	=	10.41
corr(u_i, Xb) = -0.5086	Prob > F	=	0.0001

(Std. err. adjusted for 151 clusters in country_SA)

Inhappiness_score	Coefficient	Robust std. err.	t	P> t 	[95% conf. interval]	
lngdppercap_ppp_curr	.171143	.037826	4.52	0.000	.0964024	.2458837
pslngci_controfcorr	.1766404	.1209951	1.46	0.146	-.0624345	.4157153
_cons	-.1485149	.4117823	-0.36	0.719	-.9621578	.6651281
sigma_u	.12884107					
sigma_e	.08060858					
rho	.71868523	(fraction of variance due to u_i)				

Source: Author's calculations

strength of the relationship between happiness and the nominal and real GDP per capita, respectively. Taking the second line of explanation, further investigation is needed to examine Ang's (2020) conclusions about corruption in China, which suggest that some forms of corruption may have a positive impact in the short term. In our study, we have only explored the relationship between the variables under investigation, and further research is needed to explore their causality.

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- Dr. habil László Erdey, PhD,**
Associate Professor and Head of the Institute of Economics and World Economy at the Faculty of Economics and Business, University of Debrecen, Corresponding Author, 4002 Debrecen,
Zsófia Dorka Vereb,
MSc in International Economy and Business
Sibulele Mchani,
PhD Student at the Károly Ihrig Doctoral School, University of Debrecen