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Does Institutional Quality Moderate the Relationship between Corruption and Subjective Well-Being?

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1. Introduction

Corruption, which is commonly defined as the misuse of public resources for private gain (Bardhan, 1997) in a way that changes the rules of the game (Jain, 2001), is a multifaceted phenomenon that arises when three conditions exist – discretionary power, economic rents, and institutional weaknesses (Aidt, 2003). This definition highlights that corruption and institutions are distinctly different and that institutions provide the context and motives in which corrupt acts are experienced or perceived by citizens.

Aidt (2003) identifies four types of corruption – efficient, due to corruptible bureaucracy, due to corruptible government (politicians and bureaucrats), and self-reinforcing. We argue that all types of corruption have both direct and indirect effects on subjective well-being (SWB). The direct effects stem from the psychological costs of corrupt acts, which are immoral and evoke strong negative emotions within an individual (Schnall et al., 2008). Perceptions of corruption may also hurt the SWB of individuals who are not directly affected by corruption but who are aware of it through fear of corruption or through their loss of sense of fairness in society (Welsch, 2008; Singer 2013). The SWB of recipients of bribes may also be hurt because of negative social stigma of being corrupt, especially if people are coerced to engage in corrupt acts. Indeed, corruption can create a sense of victimisation and in this regard Sulemana et al. (2017) show that experienced corruption reduces the SWB of both bribe victims and recipients. Corruption's indirect effects on SWB stem from its influence on a country's economic and policy performance and increased crime and inequality (Tavits, 2008; Mauro, 1995).

Different types of corruption are expected to have different direct and indirect effects on SWB. Efficient corruption allows citizens to get around red tape and thus enhances allocative efficiency by speeding bureaucratic procedures and the efficiency of service delivery. This type of corruption is expected to have minimal indirect effects on SWB, in line with the hypothesis that bribes 'grease-the-wheels' of growth. Under corruptible bureaucracy, the prevalence of corruption and therefore the magnitude of its direct and indirect effects are determined by how well institutions are designed. It is minimized when institutional quality is high implying that this type of corruption is rare in high-income countries. The other two types of corruption are likely to have both large direct and indirect effects on SWB. Hence, while the indirect effects of corruption on SWB may vary with the type of corruption, in all cases corruption has potentially serious direct effects on SWB. Even under efficient corruption bribe deals have the potential to hurt the SWB of bribe victims, recipients, and witnesses or people with knowledge of such deals depending on the institutional context. In this research note, we predominantly focus on the direct effects of perceived corruption on subjective well-being (SWB) – also known as life satisfaction (Veenhoven, 1984) - and the moderating effect of institutions.

The level of all types of corruption is determined by the incentive structures embodied by institutions. Under corruptible government, institutions are highly dysfunctional because politicians are not interested in designing optimal institutions (Buchanan and Tullock, 1962), while under self-reinforcing corruption countries with otherwise similar institutions may experience very different levels of corruption due to the role of history (Aidt, 2003). In other words, there may be a lag in the response of corruption to institutional improvements for two reasons. Profitable rent seeking in the past alters the distribution between rent seekers and producers in society implying a large share of rent seekers relative to producers in the future (Acemoglu, 1995). The incentives of an individual to be corrupt depend also on the collective reputation of the group to which the person belongs (Tirole, 1996). A person belonging to a

corrupt group may not find it in his interest to be honest. This path dependency implies that institutions influence the extent to which rent seeking is profitable or the consequences of associating with corrupt groups. It simply underscores the fact that institutions may impact future incentives. Hence, eventually, institutions have a moderating effect on all types of corruption and its effect on SWB.

A burgeoning literature on the well-being effects of corruption finds a strong negative association between corruption and SWB, at both the individual- and country-level (e.g., Welsch, 2008; Arvin & Lew, 2014; Tay et al., 2014; Djankov et al., 2016; Li & An, 2020, Yan & Wen, 2020). There is also a considerable literature exploring the effect of institutional quality on SWB (Frey & Stutzer, 2010). These studies show that effective and impartial government institutions increase SWB (Bjørnskov et al. 2010; Tov & Diener, 2009; Frey and Stutzer, 2000). In line with this, Ott (2010) and Helliwell and Huang (2008) find that better governed countries have higher levels of SWB relative to the rest.

We contribute to the literature by focusing on the moderating effect of institutional quality on the corruption-SWB relationship. To our knowledge this is the first paper to explore this issue.[1] We expect institutional quality to strengthen the inverse link between corruption and SWB for the following reasons. First, *high quality rule-of-law institutions and government effectiveness raise the costs of being involved in corrupt practices* and the chance of being caught, amplifying the psychological costs of being involved in corrupt deeds and therefore the negative effects of experienced corruption on SWB. Second, *greater transparency and access to information heightens perceptions of corruption* because information about corruption in society is disseminated more widely. Third, in countries with *more impartial and fair institutions*, corruption cases, although less frequent, are viewed more harshly and carry greater stigma because people place greater weight in their preferences on fairness. This is in line with the literature that finds stronger effect of corruption on SWB in high-income compared to low-income countries (Arvin & Lew, 2014; Li & An, 2020), alluding to changes in social norms as per capita income levels in a country rise with development. Among the changes in values that occur as incomes increase are greater demand for elite integrity, implying greater scrutiny over governance issues and, respectively, lower incidence of corrupt practices (Inglehart & Welzel, 2005). Fourth, and in line with the previous point, in low-income countries hardship often serves to justify corruption and to reduce the stigma and psychological costs of these acts. In high-income countries, only a small portion of society faces significant hardship which can be dealt with through safety nets and other support mechanism. Hence, *corruption cannot be justified with hardship in affluent countries*, implying that corruption is perceived as a moral failure with a greater negative effect on SWB.

Our results confirm that as institutional quality increases, the negative effect of individual perceived corruption on SWB increases, supporting the notion that better governance and elite integrity are demanded by individuals in countries with higher levels of institutional quality. These results imply that in low income countries, which typically have low-quality institutions, local demand for improved governance is weak. In turn, this underscores the importance of

[1] A related study by Jong-Sung and Khagram (2005) explores the moderating effect of income inequality on the corruption-SWB relationship in China. They argue that inequality amplifies the effect of corruption on SWB through two channels – a material effect and a normative effect. The material effect comes from the income gap between the rich and the poor. A larger gap encourages the rich to pay bribes to defend their position and interests, while the poor have little means to monitor corruption. The normative effect reflects distortions in social morality as a consequence of increasing inequality. In such a context, people become more tolerant of corruption, dampening the effect of corruption on SWB.

institution building as part of the development process; without improvement in institutional quality the local drive for improved governance will be weak. These findings are important in the context of a recent study by Witte, Burger, and Ianchovichina (2020) who find a strong association between SWB and peaceful protests. The stronger effect of perceived corruption on the SWB in countries with good quality institutions implies that the likelihood of peaceful protests in these countries is also greater during episodes of increased perceived corruption. The remainder of this paper is organised as follows. Section 2 describes the data and methodology, Section 3 reports and discusses the results, and section 4 offers concluding remarks.

2. Data and Methodology

To examine the relationship between perceived corruption and SWB, this study utilises nationally representative data from the Gallup World Poll (GWP) for the period between 2005 and 2013. This dataset includes information on individual perceptions of corruption and SWB of over 300,000 individuals from 128 countries. Information on all the relevant country-level control variables is available for 89 of these countries.

Individual perceived corruption is measured in the GWP using two separate questions that ask the respondent whether corruption is widespread throughout the government and within businesses located in the country. Responses are coded either as '*yes*' or '*no*'. Following the approach in the World Happiness Report, we create an index of perceived corruption for each individual using the average of the responses to the two questions (Helliwell et al., 2016). An overview of differences in individual perceived corruption across countries is provided in the Supplementary Material Figures A1 and A2.

Our dependent variable SWB captures an individual's subjective appreciation of his or her life (Veenhoven, 1984) and reflects people's 'happiness' or 'life satisfaction'. We measure SWB using the Cantril ladder scores at the individual-level based on the following question: '*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 and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time*'. An overview of differences in SWB across countries is provided in the Supplementary Material Figure A3 and Table A1.

Finally, to measure institutional quality, we utilise the World Governance Indicators (WGI), which employ a scale that ranges from -2.5 (weak governance) to 2.5 (strong governance). The WGI is constructed from the views of survey respondents who are experts in public, private, and non-governmental organisations (NGO) (Kaufmann et al., 2010). More specifically, we take in the following dimensions that are measured at the *national level*: voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, and rule of law. A more elaborate description of these variables can be found in the supplementary material (Supplementary Material B). Based on these five dimensions, we created an institutional quality index by estimating a simple average.[2]

Our econometric model aims to capture the relationship between corruption and SWB, specifically focusing on the moderating effect of quality of institutions and controlling for other

[2] Please note that the correlation between perceived corruption and institutional quality is low at the individual level (0.24) and only moderate at the country level (0.51).

factors that may confound this relationship. Since quality of institutions is measured at the country-level, we estimate the following equation using multi-level modelling (Hox, 2010):

$$SWB_{ijt} = \gamma_{00} + \gamma_{10}(Corruption_{ijt}) + \gamma_{01}(WGI_{jt}) + \gamma_{20}X'_{ijt} + \gamma_{02}(Z'_{jt}) + \Sigma\gamma_{30}(Year_t) + \gamma_{40}(Interaction_{ijt}) + \mu_{0j} + r_{ij} \quad (1)$$

where SWB_{ijt} refers to the SWB-level of individual i in country j and year t, $Corruption_{ijt}$ refers to the individual i's perception on the prevalence of corruption in country j and year t, WGI_{jt} refers to the WGI institutional quality measure included in the model for country j in year t, $Year_t$ represents an year dummy included to control for time-related external shocks, $Interaction_{ijt}$ represents the interaction between the WGI included in the model and individual perceived corruption, and μ_{0j} and r_{ij} represent country-level and individual-level residual errors, respectively. X'_{ijt} is a vector capturing the individual level control variables that potentially confound the relationship between individual perceived corruption, institutional quality, and SWB, including age, gender, marital status, education level, absolute income, food inadequacy, religion, pro-social attitudes, migrant status, social support, satisfaction with freedom, health problems and positive and negative affect.[3] Z'_{jt} is a vector of country controls, including GDP per capita, GDP growth, and internet accessibility. Detailed descriptions and descriptive statistics of the control variables included in our regression can be found in the Supplementary Material C and D. Please note that although our dependent variable is ordinal in nature, it has become the convention in the literature to estimate SWB equations using linear models, especially for SWB measured on 10 or 11-point scales. In this regard, Ferrer-i-Carbonell and Frijters (2004) have found that assuming ordinality or cardinality of the dependent variable does not significantly affect the results and, hence, we only use ordinal probit estimation as a sensitivity analysis.[4]

3. Empirical Results

In our estimations, presented in Table I, we examine the association between individual perceived corruption and SWB using the pooled sample. We obtain similar findings when we re-estimate our model using ordinal probit (Supplementary Material Table E). As expected, we find that individual perceived corruption in business and government is negatively associated with happiness. On average, people who feel that corruption is widespread in government and business score around 0.21 points lower on the Cantril ladder than people who do not believe that corruption is widespread in government and business (Column 1). The association between perceived corruption and SWB slightly weakens but remains statistically significant after we control for health satisfaction, positive affect and negative affect and other country characteristics such as poverty and GDP per capita (Column 2).

[3] By including positive and negative affect variables, we try to account for simultaneity between SWB and perceived corruption. Generally, however, our results should be interpreted as conditional associations rather than reflecting causal relationships.

[4] Although recent research by Bond and Lang (2019) and Schroeder and Yitzhaki (2017) has challenged this approach, claiming that SWB estimations can be reversed with certain monotonic increasing transformations of SWB data, Kaiser and Vendrik (2020) show that this would only happen under the rare instances when people use SWB response scales in a strongly nonlinear fashion. In the context of a linear model, such reversals are almost impossible.

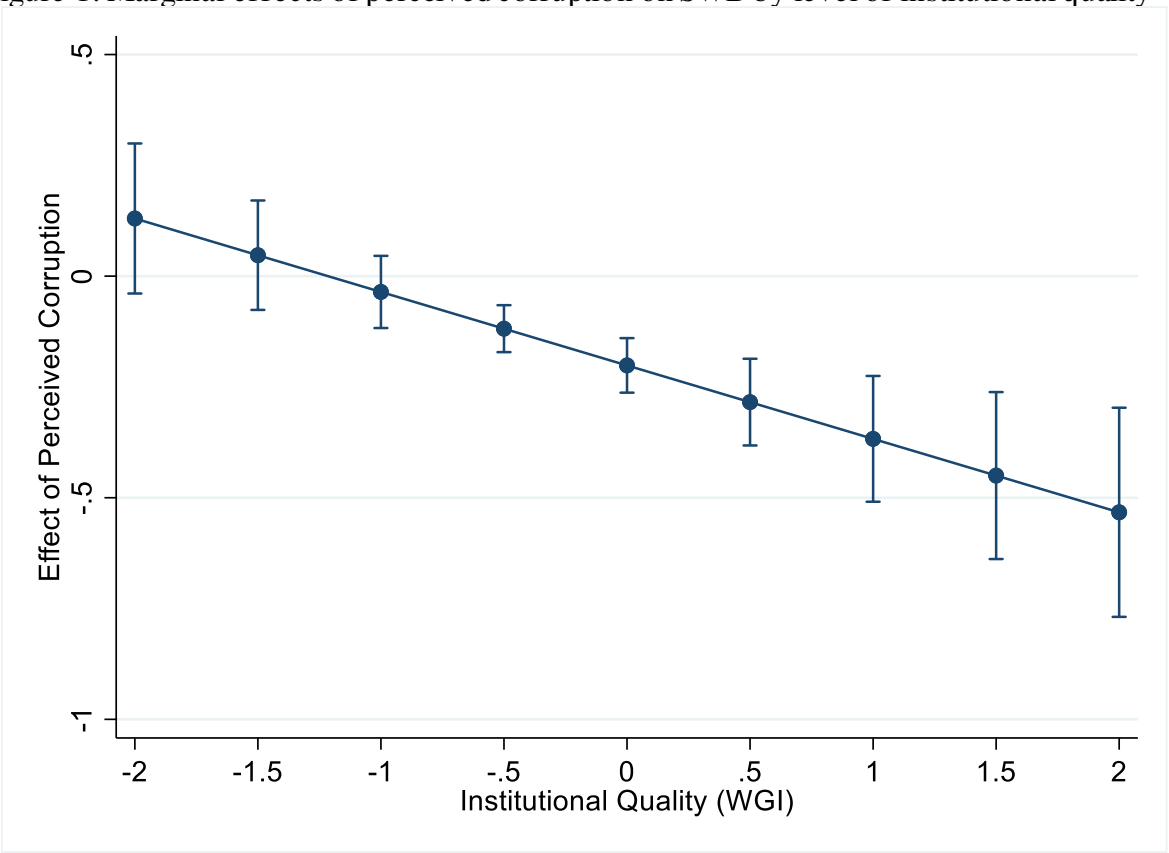
Table I:
The moderating effect of institutional quality on the relation between corruption and SWB

	(1)	(2)	(3)	(4)	(5)
	. Multilevel	Multilevel	Multilevel	Multilevel	Multilevel
Individual perceived corruption	-0.208***	-0.144***	-0.209***	0.188	-0.234***
	(0.020)	(0.027)	(0.032)	(0.249)	(0.039)
Institutional quality (country)	0.675***	0.344	0.505*	0.450	0.485
	(0.190)	(0.296)	(0.293)	(0.299)	(0.296)
Individual perceived corruption *			-0.195***	-0.125**	-0.166***
Institutional quality (country)			(0.043)	(0.059)	(0.050)
Individual perceived corruption *				-0.050	
Natural log of GDP pc (country)				(0.033)	
Individual perceived corruption *					0.002
Poverty (country)					(0.001)
Age	-0.026***	-0.019***	-0.019***	-0.019***	-0.019***
	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)
Age-squared	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Gender	-0.130***	-0.118***	-0.118***	-0.119***	-0.119***
	(0.015)	(0.017)	(0.017)	(0.017)	(0.017)
Marital status	0.168***	0.091***	0.091***	0.091***	0.091***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Education: 9-15 years	0.216***	0.191***	0.191***	0.191***	0.191***
	(0.019)	(0.022)	(0.022)	(0.022)	(0.022)
Education: 16+ years	0.452***	0.448***	0.446***	0.446***	0.446***
	(0.023)	(0.027)	(0.027)	(0.027)	(0.027)
Natural log of income	0.390***	0.357***	0.357***	0.357***	0.357***
	(0.019)	(0.021)	(0.021)	(0.021)	(0.021)
Food inadequacy	-0.658***	-0.513***	-0.513***	-0.513***	-0.513***
	(0.028)	(0.027)	(0.027)	(0.027)	(0.027)
Religiosity	0.022	-0.007	-0.007	-0.007	-0.007
	(0.014)	(0.019)	(0.019)	(0.019)	(0.019)
Charitability	0.185***	0.148***	0.148***	0.148***	0.148***
	(0.014)	(0.017)	(0.017)	(0.017)	(0.017)
Volunteerism	0.097***	0.044***	0.044***	0.044***	0.044***
	(0.013)	(0.015)	(0.015)	(0.015)	(0.015)
Migrant status	0.106***	0.050	0.050	0.050	0.050
	(0.028)	(0.038)	(0.038)	(0.038)	(0.038)
Social support	0.507***	0.391***	0.391***	0.392***	0.391***
	(0.020)	(0.021)	(0.021)	(0.021)	(0.021)
Freedom	0.327***	0.222***	0.223***	0.222***	0.223***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Satisfaction with health		-0.385***	-0.384***	-0.384***	-0.384***
		(0.018)	(0.018)	(0.018)	(0.018)
Negative experience index		-0.004***	-0.004***	-0.004***	-0.004***
		(0.000)	(0.000)	(0.000)	(0.000)
Positive experience index		0.007***	0.007***	0.007***	0.007***
		(0.000)	(0.000)	(0.000)	(0.000)
Natural log of GDP pc (country)		0.001	-0.004	0.028	-0.002
		(0.279)	(0.278)	(0.280)	(0.279)
Poverty (country)		0.002	0.001	0.001	0.000
		(0.010)	(0.010)	(0.010)	(0.010)
GDP growth (country)		0.005	0.005	0.005	0.005
		(0.006)	(0.006)	(0.006)	(0.006)
Resource rich (country)		0.238	0.235	0.233	0.235
		(0.189)	(0.188)	(0.189)	(0.188)
Internet (country)		0.006	0.006	0.006	0.006
		(0.004)	(0.004)	(0.004)	(0.004)
Intercept	1.880***	4.200	4.258	3,964	4.234
	(0.189)	(6.534)	(6.520)	(6.540)	(6.532)
Pseudo R2	0.663	0.536	0.541	0.544	0.541
Observations	399,410	274,998	274,998	274,998	274,998
Number of countries	128	89	89	89	89
Year fixed effects	YES	YES	YES	YES	YES

Notes: The dependent variable is the Cantril ladder. Cluster-robust standard errors (clustered at the country level) are in parentheses. *p<.05, **p<.01, ***p<.001.

Next, we test whether institutional quality – measured by the WGI – affects the relationship between perceived corruption and SWB (Column 3). The interaction effect in Table I shows that, in line with our hypothesis, the better the quality of institutions in a country, the stronger the negative effect of perceived corruption on SWB. As institutional quality increases, the negative association between perceived corruption and an individual's subjective well-being increases. This result can be explained with the increased personal costs and likelihood of being caught perpetrating corrupt deeds in countries with better rule of law, the heightened perceptions of corruption in countries with better access to information, and the heavy stigma imposed by corruption in more affluent societies which place greater value on fairness and associate corruption with moral failure rather than economic hardship. Figure 1 shows the average marginal effects of perceived corruption on SWB, moderated by institutional quality, indicating that the relationship between corruption and SWB is negative and statistically significant for values of institutional quality greater than -0.5. These results are confirmed when we re-estimate our model using a split sample (Supplementary Material Table F), while the individual country regressions (Supplementary Material Table G) also highlight that in countries with a lower quality of institutions, the relationship between perceived corruption and SWB is generally weaker. These results are not merely driven by the level of economic development of countries since they are robust to controlling for the economic development and poverty level and including interactions between development level and perceived corruption (Table I, Column 4) and poverty and perceived corruption (Table I, Column 5).

Figure 1: Marginal effects of perceived corruption on SWB by level of institutional quality



Note: Own estimations on Gallup World Poll Data, based on specification (3) in Table I. Error bars show 95% confidence interval.

4. Concluding Remarks

The aim of this research note is to provide a better understanding of the relationship between perceived corruption and SWB worldwide. Our results indicate that perceived corruption has a significant negative relationship with individual SWB, but there is also a sizeable number of countries in which individual perceived corruption has no significant association with SWB; these countries are characterized by (i) weak rule-of-law institutions which lower the personal costs and likelihood of being caught perpetrating corrupt deeds, (ii) poor access to information which dampens perceptions of corruption, and (iii) reduced stigma imposed by corruption in societies with malfunctioning legal institutions and economic hardship. Future research could further examine the specific channels through which institutional quality moderates the association between perceived corruption and SWB.

Our findings are in line with Inglehart's and Welzel's (2005) human development sequence hypothesis, which maintains that central values in societies change over time as a result of economic development and changing existential constraints. In post-industrial societies values have shifted from an emphasis on survival to self-expression, resulting in a greater demand for institutional quality and effective democracy, characterized by elite integrity and disapproval of corruption.

References

Acemoglu, D. (1995). Reward structures and the allocation of talent. *European Economic Review*, 39(1), 17-33.

Aidt, T. S. (2003). Economic analysis of corruption: a survey. The Economic Journal, 113(491), F632-F652.

Arvin, M., & Lew, B. (2014). Does income matter in the happiness-corruption relationship? *Journal of Economic Studies*, *41*(3), 469–490.

Bardhan, P. (1997). Corruption and development: A review of issues. *Journal of Economic Literature*, *35*(3), 1320–1346.

Bjørnskov, C., Dreher, A., & Fischer, J. A. (2010). Formal institutions and subjective wellbeing: Revisiting the cross-country evidence. *European Journal of Political Economy*, 26, 419–430.

Bond, T. N., & Lang, K. (2019). The sad truth about happiness scales. *Journal of Political Economy*, 127(4), 1629-1640.

Buchanan J.M., & Tullock, G. (1962). *The Calculus of Consent: Logical Foundations of Constitutional Democracy*. Ann Arbor, MI: University of Michigan Press.

Djankov, S., Nikolova, E., & Zilinsky, J. (2016). The happiness gap in Eastern Europe. *Journal of Comparative Economics*, 44(1), 108-124.

Ferrer-i-Carbonell, A., & Frijters, P. (2004). How Important is Methodology for the estimates of the determinants of Happiness?. *The Economic Journal*, 114(497), 641–659.

Frey, B. S., & Stutzer, A. (2000). Happiness, economy and institutions. *The Economic Journal*, *110*(466), 918-938.

Frey, B. S., & Stutzer, A. (2010). *Happiness and Economics: How the Economy and Institutions affect Human Well-being*. Princeton, NJ: Princeton University Press.

Helliwell, J. F., & Huang, H. (2008). How's your government? International evidence linking good government and well-being. *British Journal of Political Science*, 38(4), 595-619.

Hox, J. (2010). *Multilevel Analysis: Techniques and Applications*. London: Routledge.

Inglehart, R., & Welzel, C. (2005). *Modernization, Cultural Change, and Democracy: The Human Development Sequence*. Cambridge, UK: Cambridge University Press.

Jain, A. K. (2001). Corruption: A review. *Journal of Economic Surveys*, 15(1), 71-121.
Jong-Sung, Y., & Khagram, S. (2005). A comparative study of inequality and corruption. *American Sociological Review*, 70(1), 136-157.
Kaiser, C. & Vendrik, M. (2020), How Threatening are Transformations of Happiness Scales to Subjective Wellbeing Research?. IZA Discussion Paper No. 13905, Available at SSRN: https://ssrn.com/abstract=3743129
Kaufmann, D., Kraay, A., & Mastruzzi, M. (2010). *The Worldwide Governance Indicators: Methodology and Analytical Issues* (SSRN Scholarly Paper No. ID 1682130).
Li, Q., & An, L. (2020). Corruption Takes Away Happiness: Evidence from a Cross-National Study. *Journal of Happiness Studies*, *21*(2), 485-504.
Mauro, P. (1995). Corruption and growth. *The Quarterly Journal of Economics*, *110*(3), 681-712.
Ott, J. C. (2010). Good governance and happiness in nations: Technical quality precedes democracy and quality beats size. *Journal of Happiness Studies*, *11*(3), 353-368.
Schnall, S., Haidt, J., Clore, G. L., & Jordan, A. H. (2008). Disgust as embodied moral judgment. *Personality and Social Psychology Bulletin*, *34*(8), 1096–1109.
Schroeder, C., & Yitzhaki, S. (2017). Revisiting the evidence for cardinal treatment of ordinal variables. European Economic Review, 92, 337-358.
Singer, M. M. (2013). Bribery diminishes life satisfaction in the Americas. *Americas Barometer Insights*, *89*(1), 1-9.
Sulemana, I., Iddrisu, A. M., & Kyoore, J. E. (2017). A micro-level study of the relationship between experienced corruption and subjective wellbeing in Africa. *The Journal of Development Studies*, 53(1), 138-155.
Tavits, M. (2008). Representation, corruption, and subjective well-being. *Comparative Political Studies*, 41(12), 1607-1630.
Tay, L., Herian, M. N., & Diener, E. (2014). Detrimental effects of corruption and subjective well-being: Whether, how, and when. *Social Psychological and Personality Science*, 5(7), 751-759.
Tirole, J. (1996). A theory of collective reputations (with applications to the persistence of corruption and to firm quality). *The Review of Economic Studies*, 63(1), 1-22.
Tov, W., & Diener, E. (2009). The well-being of nations: Linking together trust, cooperation, and democracy. In *The Science of Well-Being* (pp. 155-173). Springer, Dordrecht.
Veenhoven, R. (1984). *Conditions of Happiness*. Dordrecht, Netherlands: Kluwer Academic.
Welsch, H. (2008). The welfare costs of corruption. *Applied Economics*, *40*(14), 1839–1849.
Witte, C. T., Burger, M. J., & Ianchovichina, E. (2020). Subjective Well-Being and Peaceful Uprisings. *Kyklos*, 73(1), 120-158.
Yan, B., & Wen, B. (2020). Income inequality, corruption and subjective well-being. *Applied Economics*, *52*(12), 1311-1326.

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Supplementary Material

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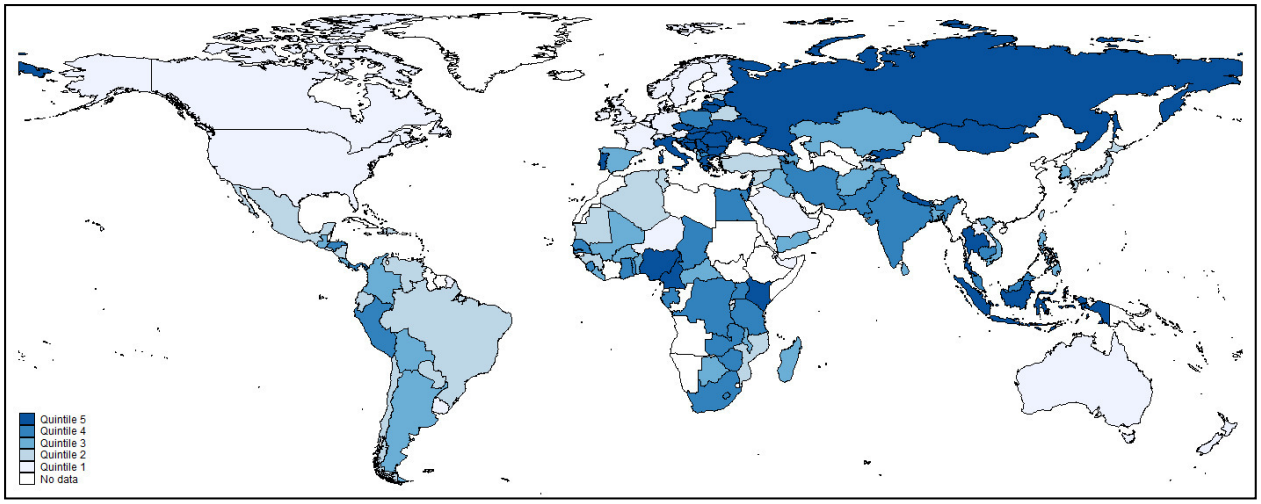
Supplementary Material A: Figures

Figure A1: The proportion of people who believe there is corruption in each country



Note: Darker colours indicate a greater proportion of people who perceive that there is a corruption in each country. The quintiles are constructed based on the average of the corruption index of nations, which is provided in Appendix B. Countries shown in white are not included in the sample. Source: authors' estimations based on Gallup World Poll data.

Figure A2: Perceived corruption and institutional quality

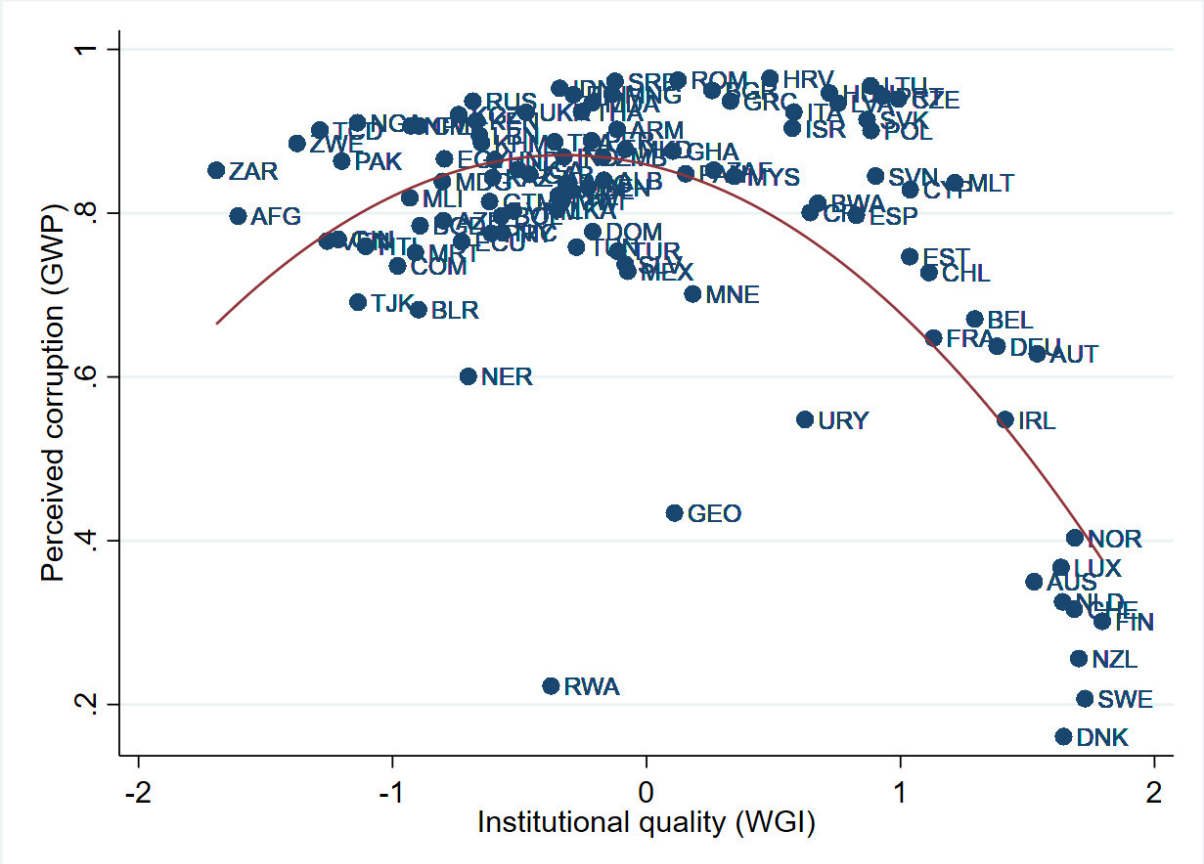
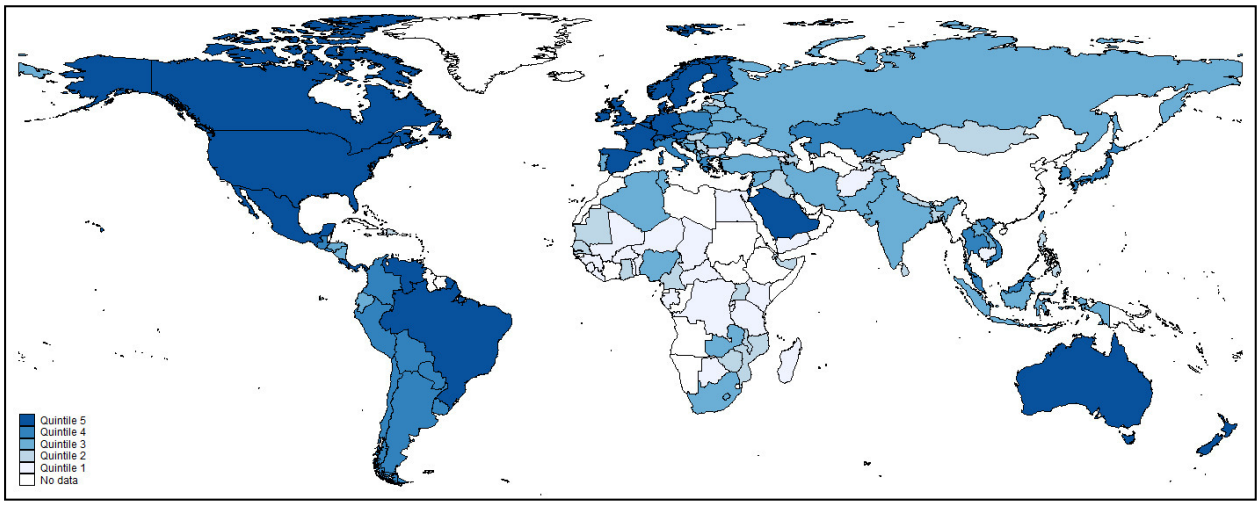


Figure A3: Cantril ladder scores for nations (2005-2013)



Note: Darker colours indicate higher levels of subjective well-being (SWB). The quintiles are constructed based on the average happiness in nations calculated using data from the Gallup World Poll (GWP), which is listed below. The responses range from 0 (worst possible life) to 10 (best possible life). Countries, shown in white, are not in the sample. Source: authors' estimations based on Gallup World Poll data.

Table A1: Average subjective well-being (SWB) in nations (2005-2013)

Country	Average SWB	Country	Average SWB
Afghanistan	4.35	El Salvador	5.65
Albania	5.48	Estonia	5.21
Algeria	5.53	Finland	7.60
Argentina	6.44	France	6.72
Armenia	4.32	Gabon	4.24
Australia	7.34	Georgia	4.15
Austria	7.36	Germany	6.68
Azerbaijan	4.67	Ghana	4.98
Bangladesh	4.96	Greece	5.71
Belarus	5.58	Guatemala	6.16
Belgium	7.02	Guinea	4.04
Benin	3.56	Haiti	4.32
Bolivia	5.71	Honduras	5.38
Bosnia Herzegovina	5.07	Hong Kong	5.61
Botswana	4.46	Hungary	4.69
Brazil	6.98	India	5.10
Bulgaria	3.96	Indonesia	5.30
Burkina Faso	4.36	Iran	5.21
Burundi	3.82	Iraq	4.87
Cambodia	4.18	Ireland	7.13
Cameroon	4.50	Israel	7.33
Canada	7.55	Italy	6.43
Central African Republic	3.66	Japan	6.09
Chad	4.30	Kazakhstan	5.62
Chile	6.30	Kenya	4.28
Colombia	6.27	Kosovo	5.50
Comoros	3.82	Kyrgyzstan	4.95
Congo Kinshasa	4.46	Laos	5.09
Costa Rica	7.33	Latvia	4.88
Croatia	5.58	Lebanon	4.93
Cyprus	6.52	Liberia	4.46
Czech Republic	6.31	Lithuania	5.53
Denmark	7.81	Luxembourg	7.17
Djibouti	4.95	Macedonia	4.59
Dominican Republic	4.90	Madagascar	4.34
Ecuador	5.50	Malawi	4.54
Egypt	4.41	Malaysia	5.89

Note: Subjective well-being is measured using the Cantril ladder question.

Supplementary Material B: Quality of Institutions Variables

In this study, we proxy institutional quality with the World Governance Indicators (WGI), which are measured on a scale that ranges from -2.5 (weak governance) to 2.5 (strong governance). The WGI is constructed from the views of survey respondents and public, private, and non-governmental organisation (NGO) sector experts worldwide (Kaufmann et al., 2010). The five indicators of the WGI included in our quality of institutions index are (Kaufmann et al., 2010, p. 4):

(1) *Voice and accountability*: Perceptions of the extent to which citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.
(2) *Political stability and absence of violence/terrorism*: Perceptions of the likelihood that the government will be destabilised or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism.
(3) *Government effectiveness*: Perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressure, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.
(4) *Regulatory quality*: Perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote sector development.
(5) *Rule of law*: Perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.

Supplementary Material C: Description of control variables

Variable	Description
Age	Age in years.
Gender	Gender is recoded into a dummy variable. 1: Male 0: Female
Marital status	Marital status is recoded into a dummy variable. 1: Married/domestic partner 0: Single/never been married/separated/divorced/widowed
Education level	Dummy variables were created to represent education level. Edu1: 0 to 8 years of education (base group) Edu2: 9 to 15 years of education Edu3: 16 years of education and more
Religiosity	Responses to the question, "*Is religion an important part of your daily life?*" 1: Yes 0: No
Natural log of income	Household income in international dollars.
Food inadequacy	Responses to the question, "*Have there been times in the past twelve months when you did not have enough money to buy food that you or your family needed?*" 1: Yes 0: No
Pro-social behavior (1) Charitability	Responses to the questions, "*Have you donated money to a charity in the past month?*", and "*Have you volunteered your time to an organization in the past month?*" 1: Yes 0: No
(2) Volunteerism	
Migrant status	Responses to the question, "*Were you born in this country, or not?*" 1: Yes 0: No
Social support	Responses to the question, "*If you were in trouble, do you have relatives or friends you can count on to help you whenever you need them, or not?*" 1: Yes 0: No
Satisfaction with freedom	Responses to the question, "*Are you satisfied or dissatisfied with your freedom to choose what you do with your life?*" 1: Yes 0: No
Health problems	Responses to the question, *"Are you satisfied or dissatisfied with your personal health?"* 1: Satisfied 2: Dissatisfied

Positive and Negative experiences	The Gallup positive experience index is constructed from the responses to five questions: (1) "Did you feel well-rested yesterday?" (2) "Were you treated with respect all day yesterday?" (3) "Did you smile or laugh a lot yesterday?" (4) "Did you learn or do something interesting yesterday?" and (5) "Did you experience the following feelings (enjoyment) during a lot of the day yesterday?" On the other hand, the Gallup negative experience index is based on the responses to the umbrella question: "Did you experience the following feelings during a lot of the day yesterday?" This question refers to the feelings of physical pain, worry, sadness, stress, and anger.
Natural log of GDP pc	Logarithm of a country's GDP per capita
Poverty	Percentage of population with per capita income below 1.90$
GDP growth	GDP growth of a country
Resource rich	Dummy from Venables (2016) classification of countries* 1: Resource-rich country 0: Not Resource-rich Country
Internet	Internet users (per 100 people) from World Bank

*Venables, A. J. (2016): "Using Natural Resources for Development: Why Has It Proven So Difficult?" *Journal of Economic Perspectives*, 30, 161–84.

Supplementary Material Table D. Descriptive statistics of individual level variables

Variable	Mean	Standard deviation	Minimum	Maximum
Subjective well-being (Cantril ladder)	5.40	2.19	0	10
Individual perceived corruption	0.78	0.37	0	1
Institutional quality (country)	-0.11	0.83	-1.84	1.80
Age	39.78	16.71	13	99
Age squared	1861.89	1517.15	169	9801
Gender	0.48	0.50	0	1
Marital status	0.88	0.32	0	1
Education: 9-15 years	0.52	0.49	0	1
Education: 16+ years	0.13	0.34	0	1
Natural log of income	8.80	1.28	2.60	15.29
Food inadequacy	0.32	0.47	0	1
Religiosity	0.75	0.43	0	1
Charitability	0.31	0.46	0	1
Volunteerism	0.21	0.41	0	1
Migrant status	0.96	0.19	0	1
Social support	0.80	0.40	0	1
Freedom	0.70	0.46	0	1
Health problems	1.22	0.43	1	2
Positive Index	69.33	28.5	0	100
Negative Index	25.6	28.7	0	100
Natural log of GDP pc	8.31	1.47	5.36	11.54
Poverty	19.17	21.53	0	77.91
GDP growth	2.31	3.92	-15.03	18
Resource rich	0.23	0.42	0	1
Internet	30.95	27.27	0.25	94.64

Note: These statistics are based on the sample of 399,410 people from 128 countries.

Supplementary Material E: Ordinal Probit Estimation

	(1) . Ordinal Probit	(2) Ordinal Probit	(3) Ordinal Probit
Individual perceived corruption	-0.150***	-0.087***	-0.143***
	(0.029)	(0.027)	(0.028)
Institutional quality (country)	0.137***	-0.106	0.036
	(0.036)	(0.076)	(0.078)
Individual perceived corruption * Institutional quality (country)			-0.172***
			(0.032)
Age	-0.014***	-0.009***	-0.009***
	(0.002)	(0.002)	(0.002)
Age-squared	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)
Gender	-0.076***	-0.059***	-0.060***
	(0.010)	(0.009)	(0.009)
Marital status	0.084***	0.065***	0.065***
	(0.013)	(0.013)	(0.013)
Education: 9-15 years	0.115***	0.082***	0.082***
	(0.022)	(0.022)	(0.022)
Education: 16+ years	0.213***	0.201***	0.199***
	(0.029)	(0.029)	(0.030)
Natural log of income	0.234***	0.189***	0.190***
	(0.016)	(0.014)	(0.014)
Food inadequacy	-0.358***	-0.311***	-0.312***
	(0.019)	(0.018)	(0.018)
Religiosity	0.024	0.042*	0.042*
	(0.023)	(0.025)	(0.025)
Charitability	0.152***	0.110***	0.110***
	(0.020)	(0.018)	(0.018)
Volunteerism	0.064***	0.016	0.016
	(0.015)	(0.016)	(0.016)
Migrant status	0.057*	0.091***	0.090***
	(0.033)	(0.032)	(0.031)
Social support	0.300***	0.219***	0.220***
	(0.018)	(0.018)	(0.017)
Freedom	0.214***	0.143***	0.143***
	(0.016)	(0.014)	(0.014)
Health problems		-0.241***	-0.240***
		(0.000)	(0.000)
Negative experience index		-0.001***	-0.001***
		(0.000)	(0.000)
Positive experience index		0.005***	0.005***
		(0.000)	(0.000)
Natural log of GDP pc (country)		0.182***	0.181***
		(0.064)	(0.063)
Poverty (country)		0.003	0.003
		(0.002)	(0.002)
GDP growth (country)		0.010*	0.010*
		(0.005)	(0.005)
Resource rich (country		-0.037	-0.038
		(0.066)	(0.065)
Internet (country)		0.001	0.001
		(0.003)	(0.003)
Observations	399,410	274,998	274,998
Year Fixed Effects	YES	YES	YES

The dependent variable is the Cantril ladder. Cluster-robust standard errors (clustered at the country level) are in parentheses. *p<.05, **p<.01, ***p<.001.

Supplementary Material F: Split Sample Estimations

	(1A) Multilevel WGI<0	(1B) Multilevel WGI=>0	(2A) Multilevel WGI<0	(2B) Multilevel WGI=>0
Individual perceived corruption	-0.176***	-0.257***	-0.119***	-0.244***
	(0.028)	(0.024)	(0.031)	(0.051)
Institutional quality (country)	0.740**	1.277***	0.382	1.681*
	(0.318)	(0.440)	(0.349)	(1.019)
Age	-0.022***	-0.040***	-0.018***	-0.028***
	(0.004)	(0.004)	(0.004)	(0.006)
Age-squared	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Gender	-0.123***	-0.148***	-0.123***	-0.112***
	(0.020)	(0.021)	(0.021)	(0.022)
Marital status	0.135***	0.200***	0.090***	0.072***
	(0.017)	(0.027)	(0.018)	(0.026)
Education: 9-15 years	0.237***	0.182***	0.229***	0.065
	(0.022)	(0.035)	(0.023)	(0.044)
Education: 16+ years	0.480***	0.389***	0.450***	0.388***
	(0.027)	(0.038)	(0.029)	(0.067)
Natural log of income	0.382***	0.406***	0.347***	0.383***
	(0.025)	(0.025)	(0.025)	(0.028)
Food inadequacy	-0.611***	-0.825***	-0.498***	-0.582***
	(0.032)	(0.050)	(0.030)	(0.051)
Religiosity	0.010	0.034**	-0.019	0.038
	(0.023)	(0.015)	(0.024)	(0.024)
Charitability	0.170***	0.211***	0.133***	0.197***
	(0.020)	(0.017)	(0.021)	(0.028)
Volunteerism	0.064***	0.172***	0.033**	0.108***
	(0.015)	(0.016)	(0.017)	(0.028)
Migrant status	0.027	0.151***	0.013	0.130
	(0.036)	(0.036)	(0.038)	(0.085)
Social support	0.474***	0.626***	0.385***	0.432***
	(0.022)	(0.043)	(0.023)	(0.053)
Freedom	0.272***	0.470***	0.199***	0.311***
	(0.021)	(0.025)	(0.019)	(0.027)
Health problems			-0.378***	-0.394***
			(0.019)	(0.043)
Negative experience index			-0.004***	-0.006***
			(0.000)	(0.001)
Positive experience index			0.006***	0.008***
			(0.001)	(0.001)
Natural log of GDP pc (country)			-0.049	1.684*
			(0.296)	(0.946)
Poverty (country)			-0.002	0.157
			(0.010)	(0.098)
GDP growth (country)			0.003	0.011
			(0.007)	(0.012)
Resource rich (country)			0.185	-1.372
			(0.203)	(1.081)
Internet (country)			0.008**	0.006
			(0.004)	(0.014)
Constant	2.227***	0.927*	3.194	-13.745
	(0.288)	(0.500)	(6.945)	(17.980)
Observations	270,727	128,683	218,804	56,194
Number of groups	81	49	69	22
Year fixed effects	YES	YES	YES	YES

The dependent variable is the Cantril ladder. Cluster-robust standard errors (clustered at the country level) are in parentheses. *p<.05, **p<.01, ***p<.001.

Supplementary Material G: Within-country estimations of the individual perceived corruption effect

Country	Corruption index (0-1)	Baseline controls	Additional controls
Afghanistan	0.79	-0.181*	-0.195*
Albania	0.84	-0.719***	-0.600***
Algeria	0.72	-0.424***	-0.505***
Argentina	0.83	-0.010	0.047
Armenia	0.90	-0.216	-0.188
Australia	0.35	-0.472***	-0.347***
Austria	0.62	-0.376***	-0.287***
Azerbaijan	0.79	-0.544***	-0.461***
Bangladesh	0.78	-0.084	-0.006
Belarus	0.68	-0.457***	-0.471***
Belgium	0.67	-0.130	-0.124
Benin	0.83	-0.239	-0.225
Bolivia	0.79	-0.055	-0.053
Bosnia and Herzegovina	0.94	-0.468*	-0.414*
Botswana	0.81	-0.133	-0.123
Brazil	0.68	-0.267	-0.279
Bulgaria	0.94	-0.189*	-0.187*
Burkina Faso	0.79	0.034	-0.015
Burundi	0.75	-0.229**	-0.250**
Cambodia	0.88	0.050	0.110
Cameroon	0.90	-0.036	-0.029
Canada	0.37	-0.390***	-0.211*
Central African Republic	0.84	0.110	0.105
Chad	0.90	0.125	0.126
Chile	0.72	-0.357***	-0.288**
Colombia	0.82	-0.110	-0.046
Comoros	0.73	-0.315***	-0.449***
Costa Rica	0.85	-0.088	-0.049
Croatia	0.80	-0.386**	-0.349**
Cyprus	0.96	-0.230	-0.241
Czech Republic	0.82	-0.538***	-0.446**
Democratic Republic of the Congo	0.93	-0.415*	-0.327
Denmark	0.16	-0.483***	-0.333**
Djibouti	0.58	-0.145**	-0.197**
Dominican Republic	0.77	0.053	0.071
Ecuador	0.76	0.132	0.155
Egypt	0.86	-0.491***	-0.443***
El Salvador	0.73	-0.300**	-0.254*
Finland	0.30	-0.286***	-0.160*
France	0.64	-0.308***	-0.202**
Gabon	0.84	0.223	0.284*
Georgia	0.43	-0.306***	-0.161*
Germany	0.63	-0.355***	-0.255**
Ghana	0.87	-0.150	-0.131
Greece	0.93	-0.266	-0.275
Guatemala	0.81	0.041	-0.028

Guinea	0.76	-0.306*	-0.212
Haiti	0.75	0.274	0.311
Honduras	0.86	0.222	-0.314*
Hong Kong	0.23	-0.475***	-0.358***
Hungary	0.94	-0.415*	-0.321
India	0.86	-0.180***	-0.152***
Indonesia	0.95	0.194	0.255*
Iran	0.87	-0.031	-0.111
Iraq	0.81	-0.071	0.020
Ireland	0.54	-0.337***	-0.261**
Israel	0.90	-0.388***	-0.339**
Italy	0.92	-0.443*	-0.438*
Japan	0.77	-0.283***	-0.206**
Kazakhstan	0.84	-0.339**	-0.243*
Kenya	0.91	-0.222*	-0.218*
Kosovo	0.94	-0.396**	-0.163
Kyrgyzstan	0.92	-0.179*	-0.182
Laos	0.62	-0.112	-0.045
Latvia	0.93	-0.866***	-0.824***
Lebanon	0.89	-0.195	-0.196
Liberia	0.84	0.418**	0.522***
Lithuania	0.95	-0.948***	-0.801***
Macedonia	0.87	-0.315*	-0.127
Madagascar	0.83	0.201*	0.209*
Malawi	0.81	-0.222	-0.237
Malaysia	0.84	-0.306***	-0.298***
Mali	0.81	-0.023	0.005
Malta	0.83	-0.862***	-0.669***
Mauritania	0.75	-0.000	0.033
Mexico	0.72	-0.150	-0.162
Moldova	0.93	0.023	0.012
Mongolia	0.94	0.133	-0.178
Montenegro	0.70	-0.681***	-0.539***
Mozambique	0.77	0.038	0.050
Nepal	0.90	-0.108	-0.160
Netherlands	0.32	-0.236***	-0.160**
New Zealand	0.25	-0.325**	-0.222*
Nicaragua	0.77	-0.241*	-0.186
Niger	0.60	-0.080	-0.044
Nigeria	0.91	-0.220	-0.203
Norway	0.40	-0.204	-0.117
Pakistan	0.86	-0.257*	-0.129
Palestine	0.75	-0.385***	-0.417***
Panama	0.84	-0.225	-0.193
Paraguay	0.77	0.093	0.077
Peru	0.88	-0.246*	-0.242*
Philippines	0.82	-0.102	-0.124
Poland	0.90	-0.387**	-0.319*
Portugal	0.94	-0.407	-0.329
Romania	0.96	0.293	0.368
Russia	0.93	-0.653***	-0.600***

Rwanda	0.22	-0.156	-0.170
Saudi Arabia	0.56	-0.313***	0.017
Senegal	0.88	-0.147	-0.135
Sierra Leone	0.88	-0.735***	-0.704***
Slovakia	0.91	-0.901***	-0.719***
Slovenia	0.84	-0.747***	-0.687***
Somaliland	0.38	-0.251***	-0.238***
South Africa	0.85	-0.002	0.026
South Korea	0.78	-0.410***	-0.286**
Spain	0.79	-0.205*	-0.164
Sri Lanka	0.80	-0.082	-0.048
Sweden	0.20	-0.194*	-0.038
Switzerland	0.31	-0.214	-0.205
Syria	0.72	-0.268*	-0.207
Taiwan	0.77	-0.599***	-0.449***
Tajikistan	0.69	-0.303***	-0.200**
Tanzania	0.88	0.111	0.127
Thailand	0.92	-0.265*	-0.263*
Togo	0.86	0.075	0.149
Tunisia	0.75	-0.072	0.103
Turkey	0.75	-0.937***	-0.931***
Uganda	0.85	-0.126	-0.107
Ukraine	0.92	-0.288*	0.030
United Kingdom	0.50	-0.591***^	-0.342**
United States	0.66	-0.378***	-0.251*
Uruguay	0.54	-0.358***	-0.299***
Venezuela	0.76	-0.317**	-0.151
Vietnam	0.80	-0.155	-0.062
Yemen	0.83	-0.382**	-0.546**
Zambia	0.86	-0.246*	-0.229
Zimbabwe	0.88	-0.278*	-0.238*

Note: Method is OLS. Dependent variable is the Cantril ladder. Baseline controls include age, age-squared, gender, marital status, education level, the natural log of absolute income, food inadequacy, religiosity, region, and survey year. Additional controls include controls for pro-social behaviour, migrant status, social support, and satisfaction with freedom. Statistical significance is indicated with the coefficients, *p<.05, **p<.01, ***p<.001.