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Is corruption detrimental to society?

An empirical investigation of corruption's effect on subjective well-being in Europe

by

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Abstract

Corruption has been a widely discussed and analysed topic for decades. However, the results stemming from research on its effect are mixed and highly volatile, leading to a debate that it may be beneficial to the economy and society. The thesis puts this to a test with a focus on Europe during 2005-2019. By using rigorous testing, different proxies for corruption and subjective well-being, and various econometric techniques, evidence arguing against corruption's positive effect on society's subjective well-being is found, yet it depends on chosen regression's functional form and proxy for corruption.

Keywords: corruption, subjective well-being, panel data, dynamics

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1 Introduction

Can corruption positively affect economic growth and thus, by extension, improve people's well-being? This question might seem somewhat futile or even provocative, yet an increasing amount of researchers are diving into the effects of corruption, finding mixed results at best (Menocal et al. 2015). One, admittedly smaller, strand of papers lead by Leff (1964) and Huntington (1968) argues that corruption may help to overcome unnecessary bureaucratic measures, facilitate economic activity or help individuals to deal with inefficient institutions, therefore indirectly improving people's subjective well-being (SWB)[1]. However, the other strand of publications relating to either economic growth (for example, Mauro, 1995; Deaton, 2008; Swaleheen, 2011) or ones concerned with subjective well-being (Djankov et al. 2016; Tay et al. 2014) finds that for both variables of interest, corruption has a strong, statistically significant negative effect that remains robust in various model specifications and after sensitivity checks.

In addition to that, Amini & Douarin (2020) note that in recent years GDP per capita (GDPpc) and SWB measures occasionally have had opposite directions, that is, even with significant economic growth, happiness had been lagging or even declining. Therefore this questions GDPpc ability to proxy one's economic well-being and welfare despite its long-standing position in the literature (Dynan & Sheiner, 2018) and now is increasingly substituted for surveys that directly ask individuals their life satisfaction. Given this, recent economic growth and advances in econometric methods, one might still wonder whether *corruption is greasing or sanding* the economic and societal mechanism wheels? This is one of the main questions for the upcoming analysis.

The thesis investigates the multifaceted effects of corruption on SWB in Europe by using country-level panel data for the time period of 2005-2019. The research design used here is somewhat more flexible and addresses potential issues that are frequently ignored in the recent literature, that is, the persistence of corruption in time, non-stationarity and potential interaction between regressors.

Results from panel regressions indicate that in growth rate functional form, corruption has a statistically significant and negative effect on SWB. When additional controls are added, their significance is varying, yet generally being on par with the current literature. In levels corruption

[1]Here and after, terms 'subjective well-being', 'life satisfaction', 'happiness' are used interchangeably. Also note that whilst for some interested party research on economic growth and happiness might seem like two different topics, here I argue that for the analysis of SWB, one can not distance from research relating to economic growth literature.

proxy's effect is insignificant and additional covariates such as GDPpc or social support seem to matter more, except for specifications where additional lags of SWB and corruption are introduced. Whilst many missing observations may be to blame for varying results, especially for those of the control variables, here I argue that despite coefficient sensitivity to chosen specification, the thesis has found evidence that corruption has a negative effect on SWB.

The thesis is organized into 7 sections. Section 2 introduces the reader with relevant theory and variables proxying life satisfaction/corruption, their typical use in research and related empirical findings. Sections 3 and 4 are complementary to the former since they describe in detail what variables, data sources are used and set the research framework. Section 5 contains the thesis' empirical findings. Section 6 discusses them, whilst Section 7 concludes.

2 Background

There are many constituents that form corruption and one's life satisfaction, thus before moving on to empirical research in this chapter I, firstly, set forth theoretical aspects on why corruption may persist in time and give a short introduction on the supposed linkage between both variables. Next, I briefly summarize empirical results in the field, and, lastly, mention some issues in proxying both variables and the misusage of GDP.

However, before that, to avoid any confusion, definitions of terms that will be used in the later parts of the thesis are now presented. As aforementioned, SWB, happiness and life satisfaction are here assumed to be synonyms and will be used interchangeably. Given this one may argue, for example, that SWB is a short-term happiness proxy, while life satisfaction – indicates one's happiness in long term, yet I do not differentiate between different time periods and only note that due to obvious data limitations by using macro-level data, different time horizon impact on SWB is not analysed here (see Tay et al. (2014) for detailed research on this).

Corruption in the thesis is defined as "the abuse of entrusted power for private gain" (Transparency International, n.d.). In particular, given data restrictions, corruption here is limited only to the public sector. That is, any corruptive action in the private sector, bribes between two private parties are not accounted for here, whilst I note that they may be equally important causes for changes in SWB, yet to be analysed in further researches with more data available.

2.1 Theoretical background

Corruption has been present since the first civilizations and still is widely discussed in research, media and politics. One of the main reasons why corruption persists over time is *asymmetric information* and its profitability under the right circumstances. We may use an example similar to that of Bose et al. (2008) to illustrate this as a principal-agent problem. Let's now assume that a government has made a procurement to deliver some sort of public good g_a. For simplicity, we may assume that a chosen bureaucrat is solely responsible for the procurement and *ex-ante* his choice to others is unknown. In addition, there exists a good g_b that is of inferior quality, yet guarantees the bureaucrat a profit margin as $P_a > P_b$. If the cost and potential risk of exposure, thus loss of the bureaucrat's job or facing criminal charges, is low, we may expect that a contract for the good g_b will be signed as a result of optimising behaviour, giving him some share of the respective price difference. Note that this simplification of the ex-ante unknown choice is not too distant from reality, as the bureaucrat may employ entrenchment strategies making him irreplaceable in this ever-increasingly complex world.

Furthermore, even under a good anti-corruption procurement framework, there are many reasons why there is no guarantee that the best and cheapest deal wins. If corruption becomes a social norm, the collective action theory predicts that in case of the entire system being corrupt except for one person, for him it does not make any sense to be non-corrupt as well, thus there will be no principals that will ensure that anti-corruption measures are in place, needing additional input from the agent, that usually are the voters (Marquette & Peiffer, 2015). These problems are somewhat similar to tax evasion (see Hindriks & Myles, 2006) – every procurement can not be thoroughly examined with the limited resources that the auditing apparatus has. Sometimes the procurement object is very specific thus any audit would require help from an expert leading to an increase in auditing expenses and time. Even requiring companies to emit some expensive signal proving their quality[2] at some point requires someone making a somewhat subjective decision of which competitor to choose. In addition, there exist some costs that are related to this lobbying effort – both involved firms and bureaucrats spend some unproductive time on finding rent (or profit) providing arrangements. All these, perhaps, minor expenses may sum up to a significant amount and come at a large cost to society and thus it is not surprising that increasing levels of corruption are associated with higher distrust in government Menocal et al. (2015).

[2]Frequently, this implies that procurement is made at a premium so that businesses have positive profit.

A similar way of theoretical reasoning is done by Leff (1964) and Huntington (1968). These papers, as aforementioned, are one of the first to present the idea that corruption might be beneficial to society. However, their reasoning is mostly based on mere argumentation and a few basic observations from data tables, rather than any statistical technique that would allow them to make any interference on corruption's effect and argue about causality. Leff (1964, p.8), for example, argues that corruption could increase investment rates as it allows businesses to circumvent unnecessary bureaucratic measures arising from "personalist and irrational style of decision-making" leading to a self-contradictory argument as the usage of bribes to avoid certain policies increase the complexity of *de facto* judicial system, reducing the competitiveness of less connected firms. Also, he states that since the amount of favours a bureaucrat may grant is of limited supply, companies have to compete with others to gain the favours needed. Whilst it may indeed be true that this increase businesses efficiency (since funding for bribes is needed) and increases competition, the paper disregards the potential impact of unproductive time spent on lobbying efforts.

The former small-scale case of a single bureaucrat corruption can be scaled up and leads to a phenomenon known as *predatory regulation* (Hindriks & Myles, 2006) meaning that some part of the bureaucratic apparatus conspire together and create heavy bureaucratic burdens which those who do not or can not pay bribes are not able to avoid, thus excluding them from the market, leading to increased uncertainty, inequality and expenses for businesses (note the similarity with Leff, 1964). Tanzi & Davoodi (1997) summarizes issues arising in the commercial side due to corruption in four points. They argue that (i) corruption leads to higher public investment, as rent-seeking bureaucrats can profit more or more easily from that[3]; (ii) as the extent of provided services and goods is not as good as it should have been, government revenues are lower; (iii) as both governments and economists argue in favour of high levels investment as it supposedly leads to higher economic growth, other necessary investments, such as maintenance and operations of utilities are neglected; this logically leads to (iv) reduction of quality and accessibility of public services – including health and education. This, however, implies that using public spending as a growth explaining variable may give erroneous results if the potential effects of corruption are not addressed.

From this theoretical investigation, whilst mostly limited to so-called "grand" or public corruption

[3]Mauro (1998) argues that high-tech, defense or others complex projects are more susceptible to corruption as they are larger in scale and the complexity may mask corruptive actions since specific expertise in the field is required to evaluate investment effectiveness. This, however, explains why education-related or similar projects that are more basic in nature or use already established technology are less frequently involved in corruption.

that I focus on in the thesis, we may observe that its linkage to society's life satisfaction is fairly direct, yet the direction of corruption's effect remains ambiguous. Corruption's intertwinement with SWB from a more empirical viewpoint is now next.

2.2 Previous empirical work

Since previously analyzed theory do not unequivocally answer the question whether corruption is *greasing or sanding* the wheels of economic growth or gives any benefit to society and some already aforementioned papers arrive at, perhaps, unconvincing results, it initially may seem plausible that corruption might be beneficial for society and individuals.[4] The following analysis of the available empirical research argues that this is not true and only in very specific settings corruption could improve one's life satisfaction.

Deciphering happiness

Data-driven economic research on happiness initially started with a conventional form: macroeconomic variables, such as unemployment levels, inflation, income or GNP (e.g., Easterlin, 1974) were correlated or regressed on life satisfaction proxying data, finding reasonably consistent results in favour of a positive SWB-GDP relationship. Then, increasingly more variables were added to the equation of happiness, such as health (Deaton, 2008) or institutions (Inglehart et al. 2008), thus covering more potential channels of impact and perhaps including some previously omitted variables. Inglehart et al. (2008) find that economic development, democratization and social liberalization, while not necessarily have a large direct effect on SWB, all three positively increase one's sense of freedom that leads to a very strong, direct and statistically significant effect on SWB. Whilst the paper is not the first to accentuate that SWB may be indirectly affected by some previously disregarded factors, this serves as a great example of how complex finding causal links and transmission channels can be.

Corruption

An indirect rebuttal of Leff (1964) and Huntington (1968) is done by Mauro (1995) that probes their findings with cross-sectional data for 1960-1985 and finds a negative, statistically significant relationship between corruption, investment and economic growth, therefore rejecting Leff's and Huntington's hypothesis. Many papers afterwards are on par with Mauro (1995) findings, for example, see Deaton (2008), Inglehart et al. (2008).

[4] A great summary paper presenting results and used methodology of some selected research papers is written by Menocal et al. (2015).

Tavits (2008) expands this analysis by using micro-level data concluding that SWB is higher if the government is effective (and is not corrupt) and that on individual level a person experiences higher life satisfaction if the party that (s)he voted for wins. In addition, for various regressions inclusion of corruption perception rendered unemployment and inflation statistically less significant. Also, a positive effect of voting for a winning party was conditional on the party being non-corrupt. Similarly, institutional importance is presented in Tay et al. (2014) where they find that corruption increases distrust in the political system/government, thus decreasing one's life satisfaction. Interestingly, the paper finds that the effect of corruption is more pronounced in the West (of Europe) as corruption there is more frowned upon and society is less adapted in tolerating it.

The effect of corruption, nevertheless, is not only dependent on social or cultural norms but also on the type of corruption, where Djankov et al. (2016) finds that in Eastern Europe (EE) petty bribery (that of corrupt traffic officers, for example) is less negative than that of high level politicians. They argue that this relates to the low tier corruption being an inseparable part of (USSR) history making it more acceptable. The paper also notes that a country experiencing political/economic reforms is more prone to face "the paradox of unhappy growth" (also see Deaton, 2008). According to Djankov et al. (2016) EE countries after separation from the USSR experienced high economic growth, yet life satisfaction was lagging. Moreover, after controlling for corruption and other covariates, such as religion, SWB differences between West and East Europe disappears.[5] Similar investigation with a focus towards EE is done by Amini & Douarin (2020). Their findings are on par with the aforementioned and their analysis suggests that both at micro and macro-level corruption's effect on life satisfaction is negative, especially for those that are less educated and have fewer connections since they are less able to use bribes in their favour.

To summarize – there are many papers investigating corruption's effect on (i) economic growth, (ii) inequality, (iii) institutional settings, or in our case (iv) SWB, yet despite a few papers initially arguing in favour of corruption, the remainder of literature find generally robust evidence that corruption is worsening economic conditions and life satisfaction, especially for transitional countries (for example, EE) and less advantaged individuals.

[5]Unexpectedly, per their individual level regressions Eastern Orthodox religion accounts for a 30% difference in life satisfaction, thus indicating a necessity to control for religion in the regressions.

2.3 Measuring corruption and subjective well-being

Obtaining reasonably reliable data for the former two variables is not as straightforward as it is with many other economic indicators. While one might argue that SWB is the least troublesome to determine (given an abundance of surveys), current proxies for corruption are primarily obtained via *subjective* measures – surveys of individuals and experts on their perceived levels of corruption. The most frequently used indices are Transparency International Corruption Perception Index (CPI) and World Bank Control of Corruption Index (CoC) that are deemed by Hamilton & Hammer (2018) as statistically most accurate proxies available.

In contrast, *objective* measures of corruption are rare and usually not very representative. Djankov et al. (2016) as a part of their research used audit data from Bulgaria analysing misappropriation of flood-related compensations in 2004-2005. Another good, whilst seemingly random, example showing the lengths taken by researchers to obtain an objective corruption proxy is seen in Fisman & Miguel (2006). They look at a natural experiment of parking ticket issuance for UN ambassadors in New York and by linking the ambassador's country of origin with the number of tickets given, they create an alternative proxy for corruption. Despite the limited amount of observations in both instances, the papers were still able to find a negative effect of corruption.

We now can take a look into SWB-related variables. To obtain a comprehensive framework of life satisfaction affecting factors, I combine classifications presented in Diener (2021) and Frey & Stutzer (2000). The result is a set of *3 larger groups supposedly affecting SWB*: micro-level variables (e.g., relating to inherited traits, genetics, household characteristics), external/macroeconomic factors (sufficient material and social resources, desirable society, inflation, unemployment) and institutional indicators (proxies for democracy, political autonomy). This categorisation is somewhat followed by researchers and affect their chosen research design – those that opt for using many micro-level indicators typically use cross-sectional data and focuses on short-term analysis, usually being constrained by surveys spanning only a few years or with a frequency of less than once in 3 years (Tavits, 2008; Rodriguez-Pose & Maslauskaite, 2012; Amini & Douarin, 2020). The other part of the papers is a mix of micro and macro-level variables. Annual World Happiness Report (WHR) by Helliwell et al. (2021) decomposes happiness measurement in constituents that are mostly of macro and institutional nature, while Djankov et al. (2016) combines multiple micro & macro-level data sets and investigates 1990-2014.

Based upon the aforementioned findings, the thesis will focus on WB Control of Corruption Index and Gallup World Poll life satisfaction measure's intertwinement, while keeping other (corruption

and SWB proxying) variables for sensitivity analysis. Also, since the most focus will be put on macro/institutional quality indicators, my research falls in the second category presented above.

2.4 Issues of using GDP as a well-being proxy

Given the good (or at least improving) quality of GDP measurements around the world paired with an abundance of research papers analysing GDP growth patterns, one might wonder if there is a need for any other indicator to analyze how countries and societies are doing. Whilst indeed GDP can reasonably well proxy economic well-being or empirically we may observe that higher (GDP) outputs tend to transfer to higher life satisfaction (Mankiw, 2011), the previous decade puts this to a test.

Firstly, as the inequality level rises any indicators based on sample means are non-representative. Alvaredo et al. (2013), for example, notes that the top 1% wealth doubled from 9% to 20% of the world's total annual income, whilst the bottom 95th-99th percentile's share increased only by 3 percentage points. Secondly, as mentioned in Chapter 2.1, high public investments, therefore higher GDP, do not necessarily correspond to supposed levels of public goods/services expected as corruption can distort their quality (put simply – our ability to use them). Lastly, Black swans such as the COVID-19 pandemic or war in Ukraine since 2014 which may be instantly seen in SWB data, might not be observed in GDP data at all, as generous stimulus packages are used to avoid GDP decline, masking the true impact of the events and leading to potentially misleading results. In addition to the aforementioned, here I disregard some obvious things, such as GDP not including time spent on leisure, its disregard for sustainability (both in terms of nature and economic variables, say, sustainability of public debt) and others on whom one can see a great discussion about at Stiglitz et al. (2013).

To summarize, GDPpc and society's subjective well-being are becoming increasingly distant variables, thus both of them should not be confused and GDPpc can not be used to proxy standards of living without considering many other characteristics affecting one's SWB such as inequality, corruption or simply methodological differences.

3 Data

Most of the data for the thesis originates from World Bank (WB; occasionally obtained via Teorell et al., 2021), Gallup World Poll (GWP; obtained from Helliwell et al. (2021) dataset) and World Health Organization (WHO), see Table 3.1 for summary statistics and data source

for variables involved in the baseline specification (see appendix A1 for a detailed description of all variables used). As my analysis mostly is concerned with the change in levels, delta (Δ) hereafter denotes variables transformed in first-differenced natural logarithms, giving us growth rate change approximation. Also, for easier comparisons "(res)" near variable name implies that it has been rescaled.

Table 3.1: Summary statistics for selected variables

Variable	Mean	Std. Dev.	Min.	Max.	Source
SWB	6.142	0.962	3.844	8.019	GWP
Δ SWB	0.006	0.046	-0.191	0.167	GWP
CoC (res)	3.512	2.03	0.06	7.264	WB
Δ CoC (res)	0.008	0.188	-1.953	1.132	WB
Δ CoC^2 (res)	0.035	0.222	0	3.813	WB
Δ GDPpc	0.021	0.037	-0.155	0.215	WB
Δ Healthy life exp.	0.003	0.002	0	0.011	WHO
Δ Social support (res)	0.001	0.045	-0.194	0.208	GWP
Δ Freedom of choice (res)	0.015	0.093	-0.366	0.426	GWP

Furthermore, from Table 3.1 we may observe that differenced variable means are close to zero, as one should expect. This implies that stationarity assumptions for regression estimates ought to be satisfied. Means (and other properties) for these selected variables in levels are also unsurprising. The mean value of SWB for 39 countries in continental Europe[6] during 2005-2019 is 6.142 out of 10 (where higher values imply higher life satisfaction), while for the corruption proxy it is 3.512 (where lower values imply a less corrupt country). Moreover, the highest value of life satisfaction is observed in Denmark, lowest in Bulgaria while perceived levels of corruption (CoC) are highest in Russia and lowest in Denmark which repeated lead in both rankings at glance seems to indicate a possible negative correlation between corruption and SWB.

4 Methodology

The research framework is based upon findings and potential issues mentioned in Chapter 2. Most importantly, given that time series measuring SWB, corruption or related characteristic variables are very limited and only infrequent cross-sectional survey data is available, here I opt to mostly use macro and institutional level variables. This implies that I do not use micro-level indicators (such as age, household income, individual's education) except for those that can be aggregated to macro level which I henceforth will refer to as *aggregated micro variables*. My research, thus follows a similar path taken by Djankov et al. (2016), Amini & Douarin (2020) and

[6] 5 countries were excluded due to missing data – Andorra, Vatican, Liechtenstein, Monaco, San Marino.

Helliwell et al. (2021), i.e., corruption proxying variable and covariates related to macroeconomic and institutional settings are regressed on SWB proxy. Formally the main model of interest is

$$y_{it} = \alpha_0 + \alpha_1 CORR_{it} + \alpha_2 CORR_{it}^2 + \beta^1 \mathbf{X}_{it}^{1'} + \beta^2 \mathbf{X}_{it}^{2'} + \mu_i + \nu_t + \varepsilon_{it}, \tag{4.1}$$

where y_{it} ($i = 1, \dots, 39$; $t = 2005, \dots, 2019$) denotes the outcome variable (i.e., life satisfaction measure), $CORR_{it}$ is our corruption proxy, while $CORR_{it}^2$ is its square. $\mathbf{X}_{it}^{1'}$ is a vector containing macroeconomic/institutional covariates and $\mathbf{X}_{it}^{2'}$ contains aggregated micro level controls. Lastly, μ_{it} denotes country specific time-invariant unobserved effects, ν_t will be used to control for year specific shocks and ε_{it} is assumed to be serially uncorrelated, homoscedastic error term.[7] Note that for simplicity Eq. 4.1 is displayed in levels, whilst the used functional form varies throughout the thesis with most commonly all variables being in growth rate form, i.e., first-differenced natural logarithms (Δ).

Variables that will be included in both vectors are common in the field and some model specification may resemble that of economic growth accounting. $\mathbf{X}_{it}^{1'}$ will contain GDPpc (that Helliwell et al. (2021) deems to be the most important variable affecting SWB), GWP's social support proxy, GWP's freedom to make choice proxy and lastly WB's 3 governance indicators – government effectiveness, rule of law and regulatory quality; all of which are supposed to have a positive effect on one's SWB. $\mathbf{X}_{it}^{2'}$ contains aggregated micro-level variables. Here life (or healthy life) expectancy at birth, religiosity, trust and, lastly, the Gini index are included. Note that there exists a slight difference between life and healthy life expectancy - nation's life expectancy may be high, yet with low healthy life expectancy SWB levels should be lower, thus if one opts for only life expectancy usage, (s)he may find a downward bias. Moreover, the Gini coefficient, in addition to being a control for different levels of inequality, may also improve the estimation accuracy if used as an interaction term with corruption, since, according to Menocal et al. (2015), high inequality levels may exacerbate the effect of corruption. This is what we discuss next.

To allow for heterogeneous effects of included regressors interaction terms will be used. In addition to aforementioned, $CORR_{it} \times GINI_{it}$ interaction, one could also interact $CORR_{it} \times TRUST_{it}$ proxies since countries with high levels of trust, corruption might have more pronounced effect.

Lastly, an important potential problem affecting the accuracy and consistency of our regressions and ones found in the recent literature might be endogeneity. In particular, it may be true that

[7] As it is argued later, the error term may partially contain dependent and independent variable's previous period lags that have to be accounted for.

$CORR_{it-n}$ or SWB_{it-n} ($\forall\, n < t$) have a high persistency in time, thus we need to account for this and fulfil strict exogeneity assumption needed in our regressions.Therefore, dynamic panel estimators are used that deals with endogeneity arising from introduction of lagged variables. Also, whilst there is no easy way to deal with omitted variables that leads again to endogeneity problems, opting for growth rate functional form may lessen their impact. This is because using variables in levels implies that we are trying to decompose SWB in its constituents and thus there exists a high possibility that some regressors might be missed. However, if we focus on change in levels this is not only a methodical difference but also implies that omitted variables are less likely to have a significant impact on the total change in the dependent variable.

5 Analysis

5.1 Corruption and SWB trends in Europe

Figure 5.1 presents a simple scatterplot showing a fairly linear relationship between CoC and SWB. In addition, we now can observe that Northern Europe (NE) has one of the highest life satisfaction levels and the lowest levels of corruption simultaneously. Similarly, the West is not far behind whilst unsurprisingly EE and SE are closer to the bottom part of the graph. Also, notice that since, according to the WB classification that is used here, the Baltic states are a part of NE and they are responsible for the lowest values in life satisfaction of the Northern countries.

As corruption is not a static phenomenon, we continue by observing CoC index[8] dynamics. Our sample is split into quartiles and in Figure 5.2 one may observe CoC values for 2002. It is not surprising to see that countries who are closer to Russia (and thus most likely were a part of the USSR upon till 1991) displays the highest levels of corruption, whilst WE and NE countries have the lowest.

Similarly, Figure 5.3 shows that in 2019 EE became less corrupt, whilst Spain in the West fell one quartile lower. Given the former, paired with Amini & Douarin (2020) findings, I will split Europe in 4 parts to see whether corruption's effect is more pronounced in any specific region.

[8]Non-rescaled CoC values seen in the two figures are within ±2.5 range with the most positive values indicating the least corrupt countries.

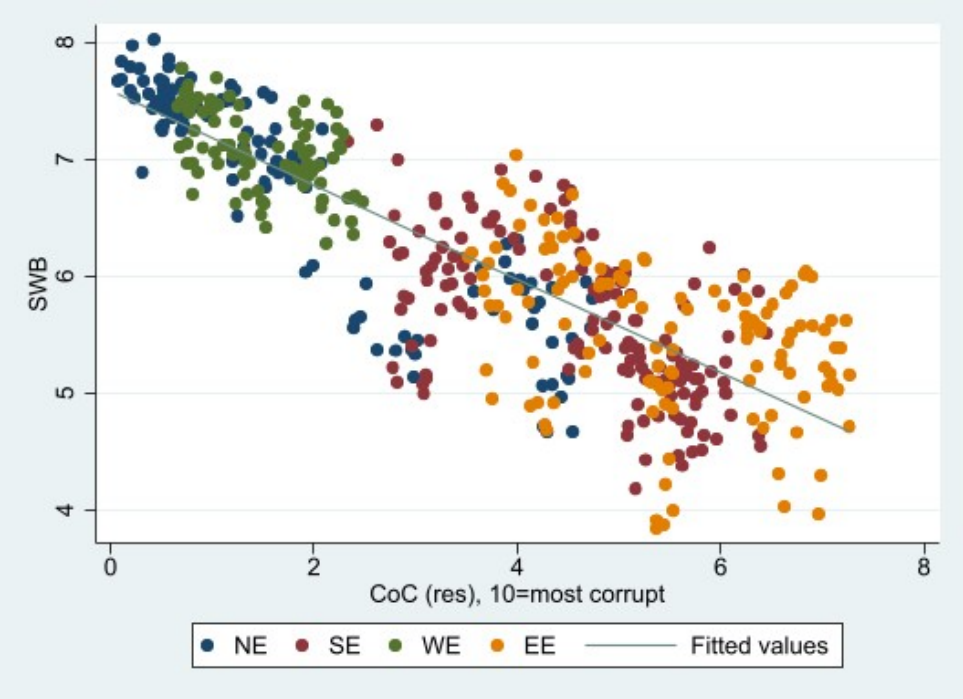

Figure 5.1: Corruption and SWB in Europe, 2005-2019

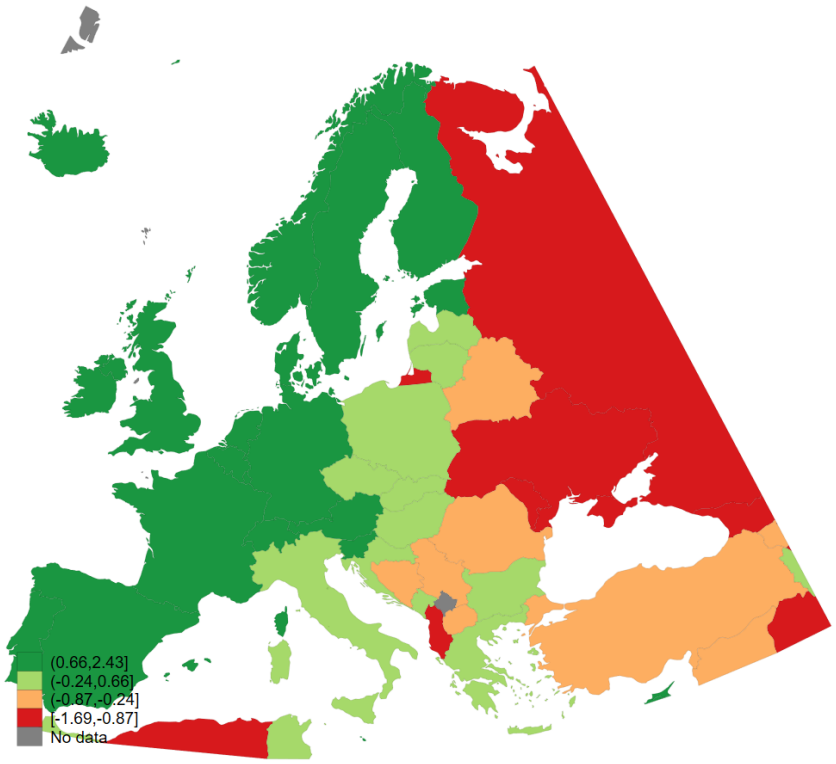

Figure 5.2: Control of Corruption Index in Europe, 2002

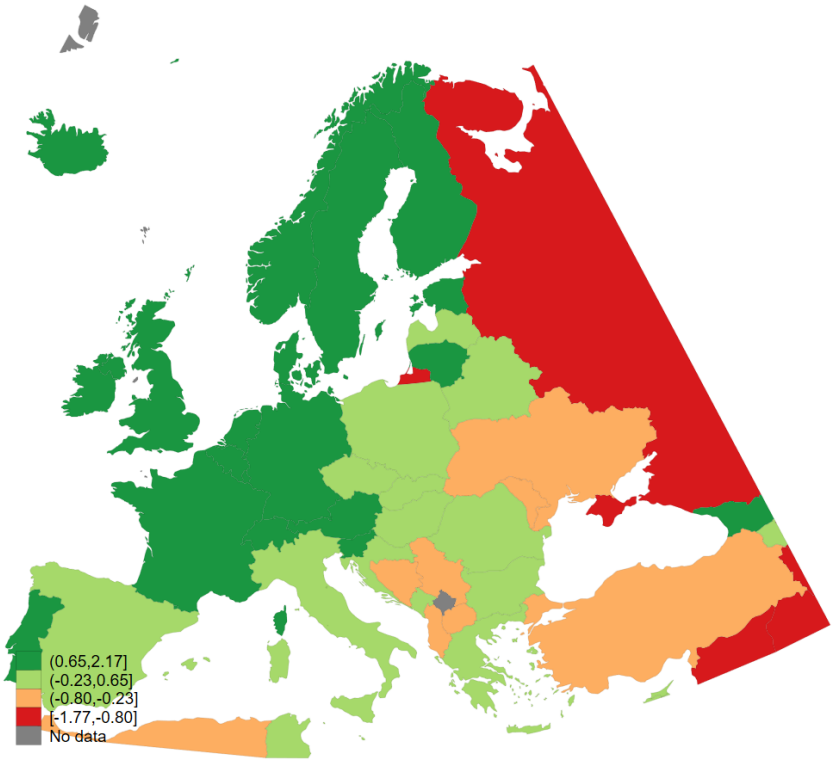

Figure 5.3: Control of Corruption Index in Europe, 2019

5.2 Empirical analysis

In addition to figures presented in Chapter 5.1, preliminary regressions (not shown) are used to determine whether there exists a first-stage relationship between our variables of interest. In both *level-level* and *change-change* functional form CoC corruption proxy is statistically significant and have sign that is on par with theoretical findings from the literature review in Chapter 2.2. Yet given that (i) there may be many confounding factors both in micro and macro levels, and (ii) that the outcome variable (SWB) seems to be non-stationary especially in the Eastern part of Europe, here, as aforementioned, I opt for the usage of *change-change* functional form in the remainder of the thesis, except for some sensitivity tests. In other words, more focus will be devoted to understanding the change in levels of corruption and SWB, rather than decomposing the constituents that are responsible for the current amount of corruption or SWB. For the latter inquiry cross-sectional micro-level survey data might be a better choice. Papers such as Djankov et al. (2016) or Amini & Douarin (2020) provides a good introduction in this.

As per our main model of interest (see Eq. 4.1), we now gradually introduce other covariates in addition to the ΔCoC variable (see Table 5.1). Growth rates of corruption proxy, GDPpc and social support are found to be significant and with signs on par with the recent literature. In

Column (4), 1% increase in the ΔCoC leads to about 0.024% reduction in the ΔSWB[9], with later model specifications explaining a larger amount of SWB's variation ($R^2 = 0.16$) and assuming higher statistical significance. Unexpectedly, as opposed to Helliwell et al. (2021) social support has a marginally larger positive effect on SWB than GDPpc, yet healthy life expectancy is not statistically significant.[10] Also note that regressions unless otherwise indicated contains country and time specific fixed-effects paired with heteroscedasticity and autocorrelation robust standard errors.

Table 5.1: Baseline estimates

	(1)	(2)	(3)	(4)
	Δ SWB	Δ SWB	Δ SWB	Δ SWB
Δ CoC (res)	-0.022*	-0.022*	-0.025**	-0.024**
	(0.013)	(0.013)	(0.011)	(0.011)
Δ CoC^2 (res)	0.014	0.014	0.011	0.010
	(0.011)	(0.012)	(0.011)	(0.011)
Δ GDPpc	0.250**	0.250**	0.199**	0.183**
	(0.103)	(0.103)	(0.094)	(0.090)
Δ Healthy life exp.		0.212	-0.293	-0.233
		(1.611)	(1.347)	(1.393)
Δ Social support (res)			0.237***	0.236***
			(0.062)	(0.060)
Δ Freedom of choice (res)				0.026
				(0.038)
Constant	-0.076***	-0.077***	-0.075***	-0.072***
	(0.003)	(0.006)	(0.005)	(0.005)
R^2	0.108	0.108	0.158	0.160
Observations	398	398	398	398

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

To verify whether these findings hold, before introducing interaction terms and lags, I run additional regressions by replacing most of the variables used in the baseline specification. These regressions can be seen in Appendix A2. As we may observe, ΔCoC is still statistically significant and the coefficient value is very similar to one before. Substitution from healthy life expectancy at birth to life expectancy at birth did not have a significant effect on SWB. In addition, after opting for a supposedly more *objective* measure of social welfare and health, i.e., by using government expenditure on social protection and health, social support proxy is not statistically significant

[9]Whilst the effect is small, note that ΔSWB's mean value for the whole time period and all countries included in the baseline estimate is 0.6% (with min/max values being -19% and 17% respectively), thus ΔCoC coefficient's relative impact must also be considered.

[10]One may observe that even though this specification heavily relies on Helliwell et al. (2021), here I do not include 2 regressors that they are using - generosity and so-called *dystopia* variable. This is because generosity is simply a residual left from their main happiness decomposition models and dystopia is a secondary residual that they use to explain part of their error term. While both of these variables may truly capture useful effects explaining SWB, they are equally likely to capture errors arising from model misspecifications, etc.

as GWP's *subjective* social protection proxy did. Another potentially more objective proxy for political and civil freedom, Freedom in World (FIW) index, became significant, yet with an unexpected negative sign. Altogether, with minor exceptions, this sensitivity test provides support of using specification from Column (4) in Table 5.1 as our primary model.

As a noticeable amount of papers analysing corruption and well-being in Europe focused specifically on Eastern Europe, for example, Djankov et al. (2016), Amini & Douarin (2020), we may verify whether this holds for our sample as well by separating Europe into multiple parts and using our main regressions from before (see Table 5.2).

Table 5.2: Baseline estimates by regions of Europe

	(1)	(2)	(3)	(4)	(5)	(6)
	Δ SWB	Δ SWB	Δ SWB	Δ SWB	Δ SWB	Δ SWB
Δ CoC (res)	-0.025**	0.031	-0.019	-0.025	-0.026**	0.058
	(0.009)	(0.074)	(0.020)	(0.197)	(0.011)	(0.080)
Δ CoC^2(res)	0.003	-0.008	-0.283**	0.263	0.011	0.800
	(0.012)	(1.235)	(0.107)	(7.003)	(0.009)	(0.514)
Δ GDPpc	0.108	0.565	-0.634	0.457***	-0.077	0.335**
	(0.125)	(0.384)	(0.490)	(0.139)	(0.084)	(0.134)
Δ Healthy life exp.	1.910	0.023	-7.123**	0.183	-2.482	0.133
	(1.765)	(2.882)	(2.128)	(2.146)	(2.763)	(1.765)
Δ Social support (res)	0.705**	0.165*	0.095	0.127	0.105	0.269*
	(0.225)	(0.077)	(0.074)	(0.096)	(0.069)	(0.130)
Δ Freedom of choice (res)	-0.050	0.070	0.117	0.064	0.131	0.023
	(0.101)	(0.063)	(0.092)	(0.062)	(0.098)	(0.059)
Constant	-0.020	0.050***	-0.028	-0.005	-0.052***	-0.015
	(0.027)	(0.013)	(0.017)	(0.021)	(0.012)	(0.014)
Region	NE	SE	WE	EE	WE & NE (ex. Baltics)	EE & Baltics
R^2	0.475	0.261	0.608	0.225	0.452	0.255
Observations	99	123	68	108	132	143

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

One can observe that only for NE and WE&NE (excluding the Baltic states) regions ΔCoC variable is statistically significant, yet it is approximately of the same value as seen in Table 5.1. Thus as opposed to the two previously cited papers, we do not find the apparent relationship between corruption and life satisfaction in EE, whilst this is on par with Tay et al. (2014) findings that corruption may have a larger effect on life satisfaction in WE as it is more unacceptable upon there. This moderate result, I argue, is mainly related to a significant decrease in the number of observations. Also, one might notice that in Column (3), healthy life expectancy has a statistically significant and negative effect, yet again with only 68 observations and a high R^2 value, this seems like a simply spurious result.

Given this, we now may introduce more flexibility in the model's specification by using additional

controls (see Table 5.3). Here one may observe, that even after introducing controls that proxy governmental/institutional quality and some aggregated micro-level variables, ΔCoC is still statistically relevant[11]. Furthermore, in contrast to Djankov et al. (2016) findings that the Orthodox church had a significant negative effect on one's SWB, here we do not find support for nation's religiosity to have any effect on SWB, nor trust in others seem to matter. This is true for both the original data that was collected once in two years, thus leading to a large loss in the number of observations and for the interpolated version at which I replaced missing values with their two closest neighbour average. Lastly, the only statistically significant variable from aggregated micro-level variables is the Gini coefficient, yet of a very small impact. Again, part of this may be related to a significant reduction in the number of observations.[12]

Previous analysis can be augmented by the inclusion of interaction terms, see Table 5.4, where I include the baseline specification paired with interaction terms and their levels. Whilst main covariates are varying in their significance, ΔCoC variable is significant and of the same magnitude in most regressions. Interaction terms in Columns (3) and (4) are not statistically significant, while we may observe that higher corruption levels paired with higher levels of inequality have a very small, yet positive effect on SWB in Column (1). Furthermore, if interaction term levels are added to the same specification, as can be seen in Column (2), we see that the inclusion of level-CoC renders its change-CoC statistically insignificant and marginally increases coefficient value for the Gini index.

In the last three tables, we have seen quite varying coefficient values for control variables, whilst the main regressor of interest ΔCoC has been statistically significant in 11 out of 16 different model specifications, with its coefficient being in the range: $[-0.068; -0.021]$. From this, whilst corruption's negative effect seems to be highly robust, I cannot with an equal level of confidence argue about other covariates. This most likely is related to (i) many missing observations, (ii) usage of growth rates to avoid spurious results as many variables used here are trending, see Granger & Newbold (1974) for a discussion on this, and lastly (iii) there may be some omitted variables leading to inconsistent estimates.

To address this and to allow for persistence in time, here dynamic panels are introduced using the baseline regression specification seen in Table 5.1. Here I assume that the only endogenous

[11]One might notice that ΔCoC^2, that is used to account for potential non-linearity, is positive and significant. Whilst this is not what the theory predicts, exclusion of the term in preliminary regressions (not shown) leads to a minor reduction in ΔCoC significance level and slight change in the coefficient value. Given this, the squared term is left in the main regressions for improved estimate accuracy.

[12]As we are using fixed-effects models here, inclusion, say, of dummies indicating a previous affiliation with USSR or simply indicating EE countries, leads to multicollinearity issues and exclusion of involved variables.

Table 5.3: Main specification with institutional and aggregated micro level covariates

	(1)	(2)	(3)	(4)	(5)	(6)
	Δ SWB	Δ SWB	Δ SWB	Δ SWB	Δ SWB	Δ SWB
Δ CoC (res)	-0.021*	-0.068***	-0.032**	-0.067***	-0.032**	-0.029**
	(0.012)	(0.020)	(0.013)	(0.020)	(0.013)	(0.011)
Δ CoC^2(res)	0.007	0.056***	0.034**	0.056***	0.034**	0.029**
	(0.013)	(0.016)	(0.014)	(0.016)	(0.015)	(0.013)
Δ GDPpc	0.160*	0.389	0.018	0.385	0.017	0.141*
	(0.088)	(0.235)	(0.159)	(0.238)	(0.158)	(0.079)
Δ Healthy life exp.	0.098	-3.033	-0.878	-3.118	-0.515	1.480
	(1.529)	(2.840)	(1.922)	(2.640)	(1.774)	(1.340)
Δ Social support (res)	0.243***	0.358*	0.141	0.363*	0.142	0.268***
	(0.062)	(0.193)	(0.127)	(0.189)	(0.129)	(0.081)
Δ Freedom of choice (res)	0.025	-0.158**	-0.018	-0.159**	-0.018	0.068
	(0.036)	(0.076)	(0.060)	(0.077)	(0.060)	(0.043)
Institutional variables:						
Δ Gov. effectiveness (res)	-0.023					
	(0.110)					
Δ Rule of law (res)	-0.023					
	(0.108)					
Δ Regulatory quality(res)	0.167**					
	(0.082)					
Aggregated micro variables:						
Religiosity		-0.004				
		(0.028)				
Religiosity (interp.)			0.006			
			(0.009)			
Trust in Other People				0.002		
				(0.026)		
Trust in Other People (interp.)					0.001	
					(0.010)	
Gini index (res)						0.008***
						(0.002)
Constant	-0.071***	-0.084	-0.093***	-0.108	-0.078	-0.318***
	(0.005)	(0.106)	(0.031)	(0.128)	(0.049)	(0.063)
R^2	0.169	0.374	0.276	0.373	0.275	0.233
Observations	398	114	203	114	203	303

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5.4: Main specification with interaction terms

	(1)	(2)	(3)	(4)
	Δ SWB	Δ SWB	Δ SWB	Δ SWB
Δ CoC (res)	-0.035***	-0.017	-0.065***	-0.065***
	(0.012)	(0.012)	(0.020)	(0.020)
Δ CoC^2(res)	0.027**	0.009	0.055***	0.055***
	(0.012)	(0.015)	(0.016)	(0.020)
Δ GDPpc	0.117	0.108	0.388	0.398*
	(0.079)	(0.086)	(0.235)	(0.213)
Δ Healthy life exp.	0.717	2.262*	-3.188	-3.113
	(1.831)	(1.127)	(2.767)	(2.556)
Δ Social support (res)	0.266***	0.270***	0.360*	0.357*
	(0.085)	(0.078)	(0.188)	(0.187)
Δ Freedom of choice (res)	0.066	0.067	-0.160**	-0.162*
	(0.042)	(0.044)	(0.077)	(0.081)
CoC (res) × Gini index	0.001***	0.003***		
	(0.000)	(0.001)		
Gini index		-0.005		
		(0.003)		
CoC (res)		-0.096***		-0.003
		(0.024)		(0.066)
Trust × CoC (res)			-0.001	-0.000
			(0.002)	(0.012)
Trust				0.002
				(0.043)
Constant	-0.148***	0.106	-0.091***	-0.099
	(0.029)	(0.108)	(0.028)	(0.239)
R^2	0.204	0.256	0.374	0.374
Observations	303	303	114	114

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

regressors from the primary model are GDPpc, SWB and corruption proxy, even though all variables might have some persistence in time (as it happens with many other economic variables in practice). This, I argue, is because that the remaining variables from economic theory's perspective, except for the former trio, are less likely to have large persistence in time, can have seemingly independent jumps irrespective of the previous periods value and in preliminary regressions for the dynamic panel specification (not shown), assuming all regressors as endogenous, nearly all coefficients become insignificant. As before robust standard errors, country and year effects are still used.

In Table 5.5 one can observe dynamic panels in levels. The approach heavily relies on Swaleheen (2011), Stata Corp (2021a; 2021b) examples. Here 2 different estimators are used here: Arellano-Bond (henceforth - GMM first-difference) estimator and Arellano-Bover/Blundell-Bond (GMM system) estimator. As our sample has many gaps in data, first-differencing used by both estimators exacerbate the already noticeable number of missing observations. This, however, might be reason for relatively high variation seen in coefficient values and their significance levels. Despite that level data coefficients on average are similar to one's seen in sensitivity tests below and on par with theory, SWB's lag has a statistically significant impact on current SWB's value and corruption proxy still has a statistically significant negative effect, whilst its lag has not.

Identical specification is used for growth rate functional form (not shown) and this, as expected, results in even fewer observations to use for dynamic panel specification. Whilst control variable coefficients are similar to ones seen in the baseline specification seen in Table 5.1, corruption proxies are not statistically significant. The most troubling finding is that lagged ΔSWB has a negative sign and remains robust in various specifications. After performing additional tests, a majority of specification used has second and higher-order autocorrelation observed in errors, leading to invalid GMM estimator results, rendering the whole growth rate specification unusable and thus I have excluded it. (Note that level specification seen in Table 5.5 satisfies the autocorrelation and Sargan over-identification tests.)

5.3 Sensitivity/robustness checks

Perhaps one of the most important robustness checks is to verify whether our findings: (i) remain robust after opting for the usage of variables in levels, (ii) our findings are similar if we use different proxies for SWB and corruption.

To preserve space the first sensitivity test is carried out only for the main specification with

Table 5.5: Main specification with lagged terms and in levels

	(1)	(2)	(3)	(4)	(5)	(6)
	GMM FD			GMM system		
	SWB	SWB	SWB	SWB	SWB	SWB
L.SWB	0.406***	0.357***	0.402***	0.458***	0.391***	0.467***
	(0.055)	(0.060)	(0.063)	(0.062)	(0.061)	(0.058)
L2.SWB		0.045			0.067	
		(0.046)			(0.041)	
CoC (res)	-0.369**	-0.269*	-0.405***	-0.434***	-0.394**	-0.465***
	(0.149)	(0.149)	(0.151)	(0.149)	(0.174)	(0.156)
L.CoC (res)	0.315	0.332	0.343	0.214	0.223	0.255
	(0.215)	(0.219)	(0.215)	(0.174)	(0.189)	(0.180)
CoC^2 (res)	0.041**	0.036*	0.043**	0.052**	0.052**	0.053**
	(0.020)	(0.021)	(0.020)	(0.020)	(0.023)	(0.021)
L.CoC^2 (res)	-0.042	-0.054**	-0.046	-0.035	-0.039	-0.037
	(0.028)	(0.027)	(0.029)	(0.024)	(0.027)	(0.025)
lnGDPpc	0.403	1.480***	0.483	0.972*	1.557***	0.958*
	(0.616)	(0.504)	(0.619)	(0.580)	(0.473)	(0.571)
L.lnGDPpc	0.027	-0.583	0.097	-0.757	-1.297***	-0.710
	(0.550)	(0.404)	(0.542)	(0.616)	(0.443)	(0.609)
Healthy life exp.	-0.119**	-0.035	-0.066	-0.010	0.000	-0.083
	(0.048)	(0.031)	(0.195)	(0.021)	(0.017)	(0.194)
Social support (res)	0.024***	0.020***	0.023***	0.018***	0.014***	0.018***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Freedom of choice (res)	0.006**	0.004	0.006**	0.008***	0.008***	0.008***
	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)
L.Healthy life exp.			-0.064			0.069
			(0.197)			(0.188)
L.Social support (res)			0.002			-0.003
			(0.004)			(0.003)
L.Freedom of choice (res)			-0.000			0.001
			(0.003)			(0.003)
Constant	4.787	-5.201**	4.056	0.046	-0.894	3.794
	(3.811)	(2.524)	(3.814)	(1.818)	(1.955)	(7.891)
Observations	353	312	353	398	353	398

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

initial controls. Also, variables are in levels, making their coefficient value interpretation close to papers reviewed in Chapter 2. As can be seen in Table 5.6, whilst in the very first regression SWB and corruption relation is significant (an increase in CoC (res) by one unit leads to a 0.481 unit decrease in SWB) and one of the largest that we have seen, after introducing additional controls, in particular – GDPpc[13], CoC (res) impact becomes insignificant.

Table 5.6: Sensitivity test: the main specification in levels

	(1) SWB	(2) SWB	(3) SWB	(4) SWB	(5) SWB
CoC (res)	-0.481**	-0.265	-0.263	-0.154	-0.124
	(0.190)	(0.186)	(0.183)	(0.159)	(0.144)
CoC^2 (res)	0.048*	0.035	0.031	0.013	0.012
	(0.025)	(0.021)	(0.023)	(0.020)	(0.018)
lnGDPpc		2.131***	2.200***	2.084***	1.815***
		(0.504)	(0.554)	(0.506)	(0.505)
Healthy life exp.			-0.061	-0.094	-0.092
			(0.082)	(0.075)	(0.071)
Social support (res)				0.030***	0.027***
				(0.008)	(0.009)
Freedom of choice (res)					0.009**
					(0.004)
Constant	7.168***	-15.225***	-11.751**	-11.250**	-9.147*
	(0.403)	(5.366)	(5.789)	(5.118)	(4.630)
R^2	0.198	0.362	0.367	0.448	0.467
Observations	485	485	485	485	485

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Our final test is to substitute corruption and SWB variables for other known proxies. As per Hamilton & Hammer (2018), World Bank's CoC proxy and Transparency International's CPI indices are found to perform best, thus here I switch from CoC used before to TI CPI, results are displayed in Table 5.7.

As TI data is available only from 2012 and onward, this results in a significant loss of observations, which may be the cause of CPI being statistically insignificant in any of the regressions. If we compare these results to ones in Table 5.1 and Table 5.6, one may observe that whilst statistical significance varies, coefficient signs and their values are somewhat similar.

As the last sensitivity test, a new proxy for SWB is introduced. For this I recoded, weighted and rescaled Eurobarometer's survey data (European Commission, 2020) and employ the same regressions used in the baseline specification, see Table 5.8.

The results from Table 5.8 are comparable to ones found before and usage of the new proxy for

[13]Note that GDPpc is expressed in ln, thus coefficient interpretation differs from other regressors included in the table, i.e., an increase in lnGDPpc by 1% leads to 2.131/100 = 0.02 unit increase in SWB.

Table 5.7: Sensitivity test: substitution for TI CPI

	(1)	(2)	(3)	(4)
	Δ SWB	Δ SWB	SWB	SWB
Δ TI CPI (res)	0.030	0.054		
	(0.040)	(0.039)		
Δ TI CPI^2 (res)	-0.217	-0.427**		
	(0.199)	(0.197)		
Δ GDPpc		0.260		
		(0.212)		
Δ Healthy life exp.		0.155		
		(1.963)		
Δ Social support (res)		0.242***		
		(0.054)		
Δ Freedom of choice (res)		0.086*		
		(0.051)		
TI CPI (res)			-0.032	-0.006
			(0.028)	(0.019)
TI CPI^2 (res)			0.000	0.000
			(0.000)	(0.000)
lnGDPpc				1.204*
				(0.608)
Healthy life exp.				-0.194**
				(0.080)
Social support (res)				0.020***
				(0.006)
Freedom of choice (res)				0.013***
				(0.003)
Constant	-0.003	-0.006	6.591***	4.416
	(0.008)	(0.009)	(0.649)	(8.189)
R^2	0.035	0.143	0.256	0.456
Observations	264	264	307	307

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5.8: Sensitivity test: substitution for Eurobarometer's SWB

	(1)	(2)	(3)	(4)
	Δ SWB (res)	Δ SWB (res)	SWB (res)	SWB (res)
Δ CoC (res)	-0.019**	-0.036**		
	(0.009)	(0.015)		
Δ CoC^2 (res)	-0.012**	-0.010		
	(0.005)	(0.012)		
Δ GDPpc		0.443***		
		(0.128)		
Δ Healthy life exp.		-1.637		
		(1.242)		
Δ Social support (res)		0.190*		
		(0.095)		
Δ Freedom of choice (res)		0.131***		
		(0.028)		
CoC (res)			0.178	0.119
			(0.297)	(0.191)
CoC^2 (res)			-0.059	-0.019
			(0.059)	(0.036)
lnGDPpc				1.791***
				(0.345)
Healthy life exp.				0.039
				(0.074)
Social support (res)				0.003
				(0.007)
Freedom of choice (res)				0.014***
				(0.003)
Constant	0.011*	0.027***	6.436***	-16.424***
	(0.006)	(0.004)	(0.286)	(5.984)
R^2	0.219	0.399	0.402	0.632
Observations	412	312	445	380

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

SWB confirms that corruption negatively affect SWB in change functional form, whilst in levels corruption's effect is rendered as insignificant and superseded by other control covariates, most importantly that of GDPpc. Corruption's coefficient value again is within the previously found range.

Based upon these results, I argue that despite apparent issues arising from fewer observations than those of cross-sectional surveys and after dealing with potential issues arising from non-stationarity, sensitivity tests performed adequately well and results found in Chapter 5.2 seem to be econometrically sound and thus inference from them is possible.

6 Discussion

The thesis aimed to verify whether there exists any linkage between corruption and subjective well-being. Whilst results have been varying, especially those of the control variables, altogether corruption seems to negatively affect society's SWB and this remains robust irrespective of chosen proxy for both variables of interest, yet not irrespective of chosen functional form. Results remain generally consistent for growth rate specification, whilst in levels with added covariates corruption's effect is superseded by the control variables, particularly that of GDPpc. In the remainder of this section, I will summarize the empirical findings from the chapter before and contrast them to recent research papers, theory and argue result implications for society, policies and further research.

Given that with the chosen research design most focus was devoted to changes in the two main variables of interest, coefficient values for papers such as Amini & Douarin (2020); Djankov et al. (2016); Helliwell et al. (2021) that decomposed happiness into its constituents including corruption, are not directly comparable as the functional form differs. Nevertheless, in terms of signs and relative sizes of coefficient values, the baseline estimates are similar to Helliwell et al. (2021) on which the baseline specification heavily relies on. In the regressions, GDPpc and social support proxy have the most consistent values and largest impact on SWB, whilst other controls change their significance as additional regressors, interaction terms are included. Most importantly, corruption proxy is statistically significant in addition to the former two regressors.

Now we shift focus on the additional covariates that were not included in the initial specification. Support for EE countries experiencing larger impact from corruption (for example, Amini & Douarin, 2020) is not found, and results are closer to to Tay et al. (2014) that argued that the least corrupt countries suffer more from corruption as the societal mechanisms that absorb the

negative effect of corruption are not as effective as they are in more corrupt countries. Also, adding governmental quality indices or trust seemed not to affect the effect of corruption as opposed to Helliwell & Huang (2006). Since specific religion composition per country data was not available, general religiosity proxy was used, yet again it was irrelevant in regressions, thus being in contrast to Djankov et al. (2016).

Given data limitations, here I cannot argue about any specific field/variable (inequality, institutional quality, etc.) affecting the magnitude of corruption's impact, however, in a standalone way, there are some things that might be considered in regards to corruption and our life satisfaction given the thesis findings. Firstly, given the heterogeneous nature of corruption, there is no one-for-all solution to combat the effects of corruption – be it or not more detrimental in a specific part of Europe, every country must investigate the causes and mechanisms that propagate corruption. Secondly, given its international nature some harmonization should be done – similar public procurement legislation, audit standards or, to combat private corruption, tax harmonisation among countries and intolerance for transfers to tax havens must be put in place. Lastly, in my opinion, the most effective way to deal with corruption is to begin a societal change and bring society's awareness to the effects of corruption. Say, if in society bribery, tax evasion and similar is frowned upon at any level, in an utopian best-case scenario, no control mechanisms are needed. Any family members, colleagues of a corrupt person may bring attention to the losses for society and thus with this social pressure, it seems increasingly unlikely that the person will continue his/her corruptive actions. Since this is a decentralized approach, it can spread as far as the societal change occurs with a fraction of cost that is needed to maintain the extensive audit apparatus. In the end, both the saved expenses to combat corruption and simply resources saved as the result of lower levels of corruption can be put to better use to the benefit of society.

7 Conclusions

Based on the empirical results, the thesis presents evidence towards corruption's negative effect on society's subjective well-being. This remains robust in various specifications and is on par with what the theory and recent research predict. Given the relatively high variation in control variables coefficient values, this supports the assumption that corruption has a highly heterogeneous nature. Therefore to combat it and, thus by extension improve society's well being, corruption has to be studied at each country separately to find reasons for its persistence.

Yet there are some reservations related to the thesis findings that must be mentioned. Relatively little data was available for panel regressions, thus results are varying and for some proxies/model specifications there are not enough observations to make strong arguments on specific indicator's effect. Moreover, as with any other growth-accounting resembling tasks, omitted variables are common, thus endangering the validity of results and makes us to use results with caution. Lastly, as the thesis' scope was limited to Europe, the external validity of this research might be relatively low and in other continents, such as Africa, corruption's and control covariates' effect might be significantly different.

In regards, to the potential improvements for the future, research can be continued by looking into constituents of corruption and devoting additional attention for private corruption that was not discussed here. Perhaps, the differences-in-differences estimator can be used to deal with omitted variables and investigate how whistle-blowing laws or any other specific policy changes affected the incidence of corruption. Also, for improved quality of research, surveys, such as World Value Survey, have to be done annually giving researchers more data to work with and allowing them to use more data demanding methods for improved estimate quality. More frequent data also would allow to investigate the corruption's effects from microdata perspective and observe its change over time. Furthermore, given the developments relating big data, unorthodox and, perhaps, more objective proxies for corruption and tax evasion can be found. For example, one could use publicly available AirBnB or similar data source to find unreported properties or sources of income.

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Appendix

A1: Detailed description of variables

Note that whilst data can be both in level and growth rate form, for simplicity here I describe variable in levels.

Variable name	Description	Source	Scale
CoC (res)	Control of Corruption Index proxies public sector's corruption levels	World Bank (2020)	0-10, lower being less corrupt
Freedom to make choices (res)	Country's aggregated result on question asking respondent's perceived freedom to make life choices	Helliwell et al. (2021); originally from Gallup World Poll	0-100, higher being freer
Gini index	Country's aggregated inequality level	Teorell et al. (2021); originally from WB WDI	0-100, lower being more equal
Gov. effectiveness (res)	Country's governmental effectiveness in providing qualitative services and fulfilling their given duties	Teorell et al. (2021); originally from WB WGI	0-10, higher being more effective
Gov. spending health & social	Annual governmental spending on health and social protection, % of GDP	IMF (2021)	None, continuous variable
Healthy life exp.	Healthy life expectancy in years at birth	World Bank (2021)	None, continuous variable
Life exp.	Life expectancy in years at birth	World Bank (2021)	None, continuous variable
GDPpc	GDP per capita (PPP, 2017 international dollars)	World Bank (2021)	None, continuous variable
Political & civil freedom (res)	Freedom in World Index indicates the general level of freedom in relation to civil liberties and political rights	Freedom House (2021)	0-100, higher being freer
Regulatory quality (res)	Country's regulatory quality, i.e., indicates how well the government implements policies and general framework to support private sector	Teorell et al. (2021); originally from WB WGI	0-10, higher being more qualitative
Religiosity	Country's aggregated result on question asking respondent's own perceived level of his/her religiosity	Teorell et al. (2021); originally from European Social Survey	0-10, higher being more religious
Rule of law (res)	Country's rule of law, i.e., whether *de jure* laws and regulations match those of *de facto*	Teorell et al. (2021); originally from WB WGI	0-10, higher being more qualitative
Social support (res)	Country's aggregate result on question asking respondent's sense of social support surrounding them	Helliwell et al. (2021); originally from Gallup World Poll	0-100, higher being freer
SWB	Life satisfaction	Helliwell et al. (2021); originally from Gallup World Poll	0-10, higher being more satisfied with life
SWB (res)	Life satisfaction (another proxy)	European Commission (2020)	0-10, higher being more satisfied with life
TI CPI (res)	Corruption Perception Index proxies public sector's corruption levels	Transparency International (2021)	0-100, lower being less corrupt
Trust	Country's aggregated result on question asking their trust in others	Teorell et al. (2021); originally from European Social Survey	0-10, higher being more trustful

A2: Sensitivity test

Here main regressors are replaced with similar variables.

	(1)	(2)	(3)	(4)	(5)
	Δ SWB	Δ SWB	Δ SWB	Δ SWB	Δ SWB
Δ CoC (res)	-0.022*	-0.022*	-0.023*	-0.025**	-0.025**
	(0.013)	(0.013)	(0.012)	(0.012)	(0.012)
Δ CoC^2 (res)	0.014	0.014	0.015	0.017	0.016
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Δ GDPpc	0.250**	0.250**	0.275**	0.254**	0.260**
	(0.103)	(0.103)	(0.110)	(0.112)	(0.112)
Δ Life exp.		-0.023	-0.121	-0.080	
		(0.885)	(0.848)	(0.825)	
Δ Gov. spending health & social			0.068	0.059	0.066
			(0.048)	(0.046)	(0.051)
Δ Political & civil freedom				-0.183**	-0.189**
				(0.085)	(0.089)
Δ Healthy life exp.					-1.356
					(1.899)
Constant	-0.076***	-0.076***	-0.077***	-0.074***	-0.071***
	(0.003)	(0.009)	(0.009)	(0.009)	(0.007)
R^2	0.108	0.108	0.130	0.141	0.143
Observations	398	398	357	357	357

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$