sustainability

MDPI

Article

The Impact of Corruption and Shadow Economy on the Economic and Sustainable Development. Do They "Sand the Wheels" or "Grease the Wheels"?

Răzvan Hoinaru [1], Daniel Buda [2], Sorin Nicolae Borlea [3,4], Viorela Ligia Văidean [5] and Monica Violeta Achim [5,*]

1. School of Business and Management, Queen May University of London, London E1 4NS, UK; r.hoinaru@qmul.ac.uk
2. Department of Public Administration and Management, Babeş-Bolyai University, Cluj-Napoca 400132, Romania; daniel.buda@fspac.ro
3. Doctoral School of Economics, University of Oradea, Oradea 410087, Romania; sborlea@uoradea.ro
4. Department of Economics, Vasile Goldis "Western" University of Arad, Arad 310414, Romania
5. Department of Finance, Babeș-Bolyai University, Cluj-Napoca 400591, Romania; vaideanviorela@yahoo.com

* Correspondence: monica.achim@econ.ubbcluj.ro

Received: 25 November 2019; Accepted: 4 January 2020; Published: 8 January 2020

check for updates

Abstract: Having in mind the main debate "grease the wheels" vs. "sand the wheels", the main objective of this study is to find the way in which corruption and shadow economy influence economic and sustainable development. A large cross-country database of 185 countries is used for the 2005–2015 time period. We find that corruption and shadow economy are poverty-driven diseases and they highly characterize low-income countries. Thus, the higher levels of corruption and shadow economy are correlated with low levels of economic and sustainable development. Then, the main contribution of this work consists of finding general and empirical evidence for the destructive role held by the corruption and shadow economy phenomena upon the economic and sustainable development of states. However, we also find some evidence that corruption can be also seen as a way to circumvent the law in order to achieve higher economic benefits and thereby to increase economic development. In addition, we find that economic and sustainable development in high-income countries is more strongly and negatively affected by the phenomena of corruption and shadow economy than in the case of low-income countries. Our research may have political implications for the government institutions that need to adopt the best-required policies, in order to boost economic and sustainable development. For low-income countries, we find some evidence for positive effects of corruption and shadow economy upon economic and sustainable development and the immediate practical implications are not to encourage but to effectively and strongly fight against these destructive phenomena and to find the proper channels to increase the institutional quality and to adopt the appropriate regulatory policies.

Keywords: corruption; shadow economy; economic growth

1. Introduction

Both corruption and shadow economy seem to have the circumvention of regulations and that of tax payments in common, further leading towards lower tax revenues, an increase in public expenditures and the hampering of productivity and growth. Therefore, generally, corruption and shadow economy are seen as two destructive activities, which also go together, undermining democratic governance and the rule of law, and negatively affecting the economic and sustainable development [1–5] The proponents of this negative effect also called this strand effect as "sand the wheels".

On the other side, there are the proponents of a positive effect held by corruption and shadow economy upon economic and sustainable development. This positive effect is also known as "grease the wheels". Supporting this view, there are findings documenting that corruption may actually help firms circumvent government regulation and therefore the firm grows [6–8]. This is also the case of several countries such as China, Vietnam and Cambodia which face economic growth in spite of their lack of good governance [8–10]. In addition, there is evidence that the shadow economy, especially in corrupt countries, represents an important buffer for solving many economic problems [11].

Having in mind this main dispute regarding the validity of these two theories ("grease the wheels" vs. "sand the wheels"), the main objective of this study is to find the answers to the following questions: Do corruption and shadow economy negatively or positively affect the economic growth of states? Do corruption and shadow economy negatively or positively affect the sustainable development of countries? Moreover, since corruption and shadow economy are more prevalent in poorer countries, this study also intends to investigate how a country's level of corruption and shadow economy influences their economic and sustainable development, for various income levels of countries.

A large cross-country database comprising 185 countries was used for the eleven-year time period between 2005 and 2015. The main contribution of this work consists of finding general and empirical evidence for the destructive role of the size of corruption and shadow economy upon economic and sustainable development. However, we also find some evidence that corruption can be also seen as a way to circumvent the law in order to achieve higher economic benefits and thereby to increase economic development. In addition, we find that economic and sustainable development in high-income countries is more strongly and negatively affected by the phenomena of corruption and shadow economy than in the case of low-income countries.

Our paper is structured as follows: the theoretical considerations are sketched in Section 2 according to which the main working hypotheses and research questions are stated, while Section 3 contains the methodology and the data sources, along with the description of variables. Considering the available measurements of economic and sustainable development, the main working hypotheses and research questions are stated. Section 4 describes the results and discussions of the main empirical findings followed by our conclusions.

2. Literature Review

An important strand in the literature supports the "sand the wheels" theory, documenting the destructive influence of corruption and shadow economy upon the economic and sustainable development of states. The World Bank [12] identifies corruption as one of the greatest obstacles to economic growth, social development and reduction of poverty. By carrying a large cross-countries survey over the 2007–2012 periods, Groșanu et al. [5] find that a high quality of public governance fosters entrepreneurship, determining an increase of new entrants of companies and vice-versa. Regarding the regulation of entry, Djankov et al. [2], working on 85 countries, a document that the official costs of entry are very high in most countries. This impediment is circumvented by companies, further enhancing corruption. Djankov et al. [2] find that in countries with strong regulation of entry, the levels of corruption and that of the shadow economy are higher than in the countries with low regulation. A lot of evidence suggests that corruption has a negative effect on economic development, being an impediment for increasing investments [1,13], absorption of European funds [14], efficiency in fiscal policies [15–18] and finally for economic growth. For instance, Kaufman [17] obtains a strong relationship between corruption and fiscal deficits in industrialized countries. Further, he also finds that corruption lowers tax revenues, increases public expenditures while affecting productivity, competitiveness and growth. In the same view, Ivanyna et al. [18] point out that increasing corruption leads towards a decrease in government revenues and it also hampers economic growth. Similarly, a negative perception of the corruption phenomenon is present among physical persons too, covering all age groups, from students to retired people. For example, Bordean [19] refers to the general phenomena of corruption that seems to have conquered all the local authorities of the state through the eyes of young respondents from a low-income country.

Moreover, De Rosa et al. [20], by conducting a large survey upon 11,000 firms from 28 transition and developed countries, find evidence that bribing taxes to circumvent the bureaucratic requirements is not considered the best option to achieve higher productivity and therefore corruption has negative consequences for enterprise performance. The study of Achim [21] conducted on a sample of 185 countries for the 2012–2015 period shows that corruption significantly reduces the ease of doing business, the level of entrepreneurship and market capitalization as selected indicators for business development, being a major obstacle for economic growth. Regarding the impact of corruption on sustainable development the findings of Absalyamova et al. [22] reveal a negative effect as follows: a 1% increase in the corruption levels of the socio-economic systems of a state causes a decrease of more than 1% of the value of the human capital sustainable development index (HCSDI) of that state. In the same view, Forson et al. [23] find that corruption poses a long-term threat to the sustainable development of 22 economies in Sub-Sahara Africa. Moreover, several studies have associated shadow economy (or informal sector) with low productivity and low economic development. For instance, the shadow economy has a lower share in high-income countries, while counting for as much as 70% of low-income African economies [24]. In conclusion, a large strand of the literature shows that both corruption and shadow economy seem to have in common the avoidance of regulations and payments of taxes, thus resulting in lower tax revenues, an increase of public expenditures and the hampering of productivity and growth [25].

However, there is another strand in the literature supporting the "grease the wheels" theory. These opposed findings document the positive effect of existing corruption and shadow economy upon the economic and sustainable development of countries. For instance, Jiang and Nie [8] empirically document the Chinese miracle of continued high Gross Domestic Product (GDP) growth despite the prevalence of government corruption. By conducting a large survey on the Chinese firms covering the 1999–2007 periods, they find that corruption has a positive effect on the profitability of companies, but only for the private ones. For these private firms, corruption may help them to circumvent government regulations and therefore their profitability is enhanced. They conclude that in countries with a low quality of governance, corruption may actually foster resource allocation and therefore the productivity is increased. Some similar results are obtained by Beck and Maher [6] who find that, in the absence of penalties for bribery, supplier firms are indifferent to the choice between bribery or bidding institutions. Thus, corruption may be used as a way to get the higher price of business opportunities. Hamra [26] also highlights the preference for bribery in international business transactions and its benefits. Some nuanced results are obtained by Sahakyan and Stiegert [4] who find that the relationship between corruption and firm performance depends on the size of their activity, the age of the firm and the numbers of competitors. They empirically document that large firms, young firms and firms with few competitors are statistically more prone to see corruption as a way to increase firm performance. Also, the level of education achieved by managers decreases the likelihood to see corruption as a way to circumvent the law. In the same line, Zaman and Goschin [11] and Ruzek [27] argue for a positive and required role of the shadow economy upon economic and sustainable development. Thus, Zaman and Goschin [11] highlights that shadow economy, especially in corrupt countries, represents an important buffer for solving many problems such as the high rate of unemployment, the future usage of black money in the official economy, and the local efficient use of public goods, based on market principles in the situation in which goods are used by a limited number of beneficiaries (private/public local beneficiaries) who pay different and voluntary-based contributions. In the same view, the economic recessions are supposed to not only be a negative phenomenon but a factor which should be exploited in what could be their progressive inputs [11]. Moreover, the informal sector may provide social capital, promote local economies, create jobs and provide the needed economic shift towards a sustainable future [27]. Under these positive effects of the shadow activities, decision-makers should pay attention to both sides of the coin by minimizing the negative effects and maximizing the potentially positive consequences at the same time [11].

Furthermore, various studies document that high-income countries face a low level of corruption and shadow economy. Thus, Husted [28] argues that "since the level of development is related to the overall level of resource munificence, one would expect that corruption would be more common in the less developed economies". In this view, Treisman [29] and Paldam [13] argue that corruption is a poverty-driven disease which vanishes when the country becomes richer. Gundlach and Paldam [30], after empirically analyzing the bilateral causality between income and corruption, conclude that the long-run causality appears to be entirely from income to corruption and the cross-country pattern of corruption can be fully explained by the cross-country pattern of income. Supporting this view, De Rosa et al. [20] confirm a correlation coefficient of 0.81 between GDP per capita and Transparency International's Corruption Perception Index [31]. This means that a higher level of corruption correlates with a lower level of income. The study of Achim [21] finds that the influence of corruption on business development (reflected through the ease of doing business, the level of entrepreneurship and market capitalization) is negative and significantly higher for developing countries as compared to developed countries. It means that the extent to which corruption affects business development is higher for developing countries than for the developed ones. This finding concludes that corruption is a poverty-driven disease which significantly hinders business development. However, some researchers find a positive association between wealth and corruption and they explain this by the fact that a high level of wealth could lead to increased opportunities for government officials to extract rents, thereby increasing corruption [7]. Similar results are empirically obtained by Jiang and Nie [8] for China. They show that corruption helps private firms circumvent regulation and therefore offer an understanding of the high-growth miracle of China with high corruption. The international business trade used to be licensed by the government and trade quotas were strictly controlled, which further affected private firms the most. Under the weak regulation of the Chinese government, private firms have to corrupt regulators to evade legal restrictions and thereby make a profit out of more flexible business operations. However, the authors stated as an immediate practical implication of their results to clear away the mud under which corruption breeds i.e., inappropriate regulatory policies and excessive government intervention in the marketplace [8].

Regarding the shadow economy, Schneider and Klingmair [32] find that the highest rates of shadow activities are associated with developing and in transition countries. According to Kirchler [24], in Africa and South America, 41% of economic activities are clandestine. Orviska and Hudson [33] support the idea that in developed countries, tax fraud is estimated at 20% of the total income, while in developing countries that percentage is even higher.

3. Methodology and Data

3.1. Working Hypotheses and Research Questions

Having in mind both strands in the literature regarding the availability of the "grease the wheels" or "sand the wheels" perspective regarding the impact of corruption and shadow economy upon economic and sustainable development, the following hypotheses are stated:

Hypothesis 1. The higher the level of corruption, the lower the level of economic development.

Hypothesis 2. The higher the level of corruption, the lower the level of sustainable development.

Hypothesis 3. The higher the level of shadow economy, the lower the level of economic development.

Hypothesis 4. The higher the level of shadow economy, the lower the level of sustainable development.

Based on the empirical aforementioned findings, we may conclude that the income patterns have a main influence on the patterns of corruption and shadow economy. All in all, this study supports the expectation that corruption and shadow economy would be more common in poorer countries. In this view, we are interested in investigating the extent to which this relationship depends on the level of country development. Therefore, we state the following research questions:

Research question 1. How does the impact of corruption upon economic development differ among high-income and low-income countries?

Research question 2. How does the impact of corruption upon sustainable development differ among high-income and low-income countries?

Research question 3. How does the impact of the shadow economy upon economic development differ among high-income and low-income countries?

Research question 4. How does the impact of the shadow economy upon sustainable development differ among high-income and low-income countries?

3.2. Defining and Measuring the Variables

3.2.1. Defining and Measuring the Dependent Variables: Corruption and Shadow Economy

According to Transparency International [31], corruption is defined as the abuse of entrusted power for private gain. It can be classified as grand, petty, and political, depending on the amounts of money lost and the sector where it occurs. The World Bank [34] provides a short definition of corruption in which corruption is "the abuse of public office for private gain." We measure corruption using the latest report of the Corruption Perceptions Index (CPI) provided by Transparency International [31]. This index measures the perceived levels of corruption in the public sector of worldwide countries. Scores ranged from 0 (highly corrupt) to 100 (very clean). This study deals particularly with countries whose rankings ranged from 1 (lowest level of corruption) to 180 (highest level of corruption).

In order to define shadow economy (SE), we use the narrow definition provided by Schneider and his contributors [35–37]. According to these authors "The shadow economy includes all market-based legal production of goods and services that are deliberately concealed from public authorities for the following: **a**. to avoid paying income, value-added, or other taxes, **b**. to avoid paying social security contributions, **c**. to avoid having to meet certain legal labour market standards, such as minimum wages, maximum working hours, and safety standards, and **d**. to avoid complying with certain administrative procedures, such as completing statistical questionnaires or other administrative forms". We rely on this narrow definition of the shadow economy that refers only to activities that are concealed from the government, rather than to those that are illegal (activities that produce branded goods illegally, drug trafficking, prostitution, loan sharking, illegal gambling, hiring of illegal immigrants, hidden income, and tax fraud). We measure the shadow economy using data provided by Medina and Schneider [35] for the 2005–2015 time period, throughout which it is calculated as a percentage of the official GDP.

3.2.2. Defining Independent Variables: Economic and Sustainable Development

Economic development is generally defined as "sustained increase in the economic standard of living of a country's population, normally accomplished by increasing its stocks of physical and human capital and improving its technology [38]."

Economic development is measured with the Gross Domestic Product per capita (GDPpercap), a very used indicator measuring the level of development and prosperity of a country. Following various authors [23,39,40] which investigate the influence of corruption and shadow economy upon the economic development) we are going to use the per capita GDP of countries as a measure for their economic development. The indicator is annually provided by the World Bank [41].

Current research of the economic phenomena goes beyond the economic explanations, emphasizing the role of social and psychological dimensions. Stiglitz et al. [42] highlight the importance of measuring a nation's emotional prosperity rather than its economic prosperity, focusing more on well-being rather than on wealth. Also, Aidt [43] highlights that GDP per capita is not necessarily a good measure of development as long as development is supposed to be concerned with sustainable improvements in human welfare and not spontaneous improvements. Therefore, a growing number of studies use an alternative measure of development which is welfare driven [23].

The theme of sustainable development has been initiated since 1970, with the publication of the first report of the Club of Rome entitled "The Limits of Growth".

The most well-known definition of this concept is mentioned in the report of the World Commission on Environment and Development [44], known as the Brutland Committee. It defines sustainable development as "a development that meets the needs of the present generation, without compromising the ability of future generations to meet their own needs". In the context of sustainable development, the concept of corporate social responsibility occurs. This concept defines the orientation and attitude of an organization to voluntarily integrate into its strategy and work the social and environmental concerns, while ensuring the economic success of the business. At the macroeconomic level, sustainable development includes at least three economic, social and environmental pillars which should be equally and completely integrated into the process of enhancing development.

Sustainable development is measured with the help of the following indicators:

(**a**) The human development index (HDI) reflects a final criterion for evaluating the development of a country, not just for economic growth. It is a summary measure of the average achievement in three key dimensions of human development: a long and healthy life, being aware of the cause and having a decent standard of living, according to UNDP Human Development Reports [45]. The HDI indicator is used in many research papers as a proxy for sustainable development [22,46].

(**b**) Environmental performance index (EPI) which provides a national scale of how close countries are to meeting the established environmental policy goals. The EPI thus offers a scorecard that highlights leaders and laggards in environmental performance, gives insight on best practices, and provides guidance for countries that aspire to be leaders in sustainability [47]. Environmental Performance Index (EPI) ranks 180 countries on 24 performance indicators across ten issue categories covering environmental health and ecosystem vitality. It is used in many studies as a proxy for environmental performances [48–50]. The environmental indicators comprised by EPI are focused on two objectives: on the one hand, a reduction in environmental stresses to human health and, on the other hand, the protection of ecosystems and natural resources [48,49].

Besides these two variables, which are used on the turn as exogenous variables, our study also uses time dummies for the crisis years (2008, 2009, 2010), in order to capture its potential effects.

3.3. Sample and Data

A large cross-country database comprising 185 countries is used for the eleven-year time period between 2005 and 2015, for which, all variables data are available. We are constrained by the existing data for the shadow economy, only available up to 2015 (according to the data provided by Medina and Schneider [35]).

Our research is developed further in order to point out the influence of a country's income on its business development. For this purpose, we use the classification in developed (high-income) and developing (low-income) countries which are based on the income classifications provided by World Bank report 'Country and Lending Groups' [51], for 214 countries. We classified the countries with high-income (gross national income above $12,376 per capita) as being developed countries and the countries with low-income, lower middle income and upper middle income (gross national income below $12,375 per capita) as being developing countries. In our study, we symbolize developed countries with *HI* and developing countries with *LI*, with a detailed list provided by Table A1, Appendix A.

3.4. Descriptive Analysis

Table 1 contains the main descriptive statistics for the dependent and independent variables of our study, for the entire sample of 185 countries (_ALL) and for the two subsamples of high-income countries (_HI) and low-income countries (_LI). The high standard deviations for all variables show a high level of heterogeneity which requires care in interpreting the results. We may also remark the existence of high differences in the mean and median values of our variables among the two samples (high and low-income countries) which justifies our choice to perform a separate analysis for these two subsamples. High-income countries register higher levels of economic and sustainable development (expressed by their GDPpercap, HDI and EPI) and low levels of corruption and shadow economy while for low-income countries, it's exactly the other way around. We may further notice that, in accordance with research findings, corruption and shadow economy are poverty-driven diseases and high-income countries have a low level of corruption [13,20,28–30] and low levels of their shadow economies [24].

Table 1. Summary Statistics for the entire sample and the subsamples of high-income (HI) and low-income (LI) countries respectively, using the observations 1:01–185:11 (missing values were skipped).

Variable	Mean	Median	S.D.	Min	Max
GDPpercap_ALL	1.31×10^4	4.70×10^3	1.89×10^4	151.	1.19×10^5
GDPpercap_HI	3.57×10^4	3.18×10^4	2.11×10^4	5.22×10^3	1.19×10^5
GDPpercap_LI	3.54×10^3	2.60×10^3	3.22×10^3	151.	1.57×10^4
HDI_ALL	0.677	0.706	0.161	0.286	0.949
HDI_HI	0.853	0.865	0.0604	0.569	0.949
HDI_LI	0.605	0.635	0.132	0.286	0.836
EPI_ALL	50.12	49.67	16.63	14.68	88.79
EPI_HI	66.24	67.97	13.00	21.57	88.79
EPI_LI	43.37	43.75	12.94	14.68	87.67
COR_ALL	86.0	84.5	50.4	1.00	182.
COR_HI	33.3	26.0	29.9	1.00	172.
COR_LI	109.	110.	38.9	11.0	182.
SE_ALL	29.1	29.4	12.3	6.16	69.1
SE_HI	18.1	16.6	7.81	6.16	39.9
SE_LI	34.5	33.7	10.3	11.7	69.1

Source: Authors' processing.

When we perform an analysis on geographical regions, we observe that the highest levels of economic and sustainable development (expressed by *GDPpercap*, *HDI* and *EPI*) are found in North American countries (Canada and Unites States) while the countries from Sub-Saharan Africa and South-Asia face the lowest levels of these economic and sustainable development indicators. In the same time, we may notice that North American countries register the lowest sizes of corruption and shadow economy. On the opposite, the countries from Sub-Saharan Africa register the highest sizes of financial crimes under the form of corruption and shadow economy.

Table 2 contains the correlation matrix of the variables reported in the main results of this paper, for all 185 countries in the eleven-year time period. The scatter plots are found in Appendix D. For normality reasons, the per capita GDP has been used as a logarithm. The variables LogGDP, HDI and EPI have negative and high correlations with COR and SE, meaning that higher levels of economic and sustainable development are associated with lowers sizes of corruption and shadow economy.

Table 2. Correlation matrix.

	LogGDP	**HDI**	**EPI**	**Corr**	**SE**
LogGDP	1.0000				
HDI	0.9220	1.0000			
EPI	0.7726	0.8027	1.0000		
COR	−0.7539	−0.7295	−0.6625	1.0000	
SE	−0.6900	−0.6502	−0.5975	0.6548	1.0000

Source: Authors' processing.

4. Results and Discussions

Our main results consist of explicating economic development (LogGDP) and sustainable development (HDI and EPI) as a function of corruption rankings (COR) and shadow economy (SE) as exogenous variables, taken independently: COR in Models (1) and SE in Models (2). Each model is at first estimated through the Pooled OLS technique for panel data, and then the estimations are also performed on the fixed-effects model (FEM) and the random-effects model (REM) for panel data. The simplest estimator for panel data is the one obtained through the pooled OLS method, one of the widest used techniques, providing the researchers with a baseline for comparison with more complex estimators. Its principal alternatives are the fixed effects and random-effects models. A FEM generally refers to a model in which the group means are fixed (non-random) as opposed to a REM in which the group means are a random sample. FE requires fewer assumptions than RE but it fails to estimate time-invariant covariates coefficients. On the other hand, RE is more efficient, at the cost of distributional assumptions. All the necessary validation procedures are performed to ensure the statistical significance of the results. Robust standard errors are used each time. All F-tests point towards the FEM models and all Breusch-Pagan tests point towards the REM models, so the final decisions for the optimum estimation techniques (bolded out) are taken with the help of the Hausman test. Its values and associated probabilities are found on the bottom line of Table A2a,b, Table A3a,b and Table A4a,b, Appendix B. Each time, the optimal models are graphically represented in Appendix E.

Our initial estimations include yearly dummy variables and we notice a pronounced impact of the 2008 major financial crisis, in that particular year and the following two years. As such, in order to capture the effects of the crisis that started in 2008, we keep the time dummy variables for the years 2008, 2009, 2010 (Dummy_2008, Dummy_2009, and Dummy_2010, respectively), that are generally validated throughout our models.

All our main results are found in Appendix B. Table A2a,b contain the estimates for the economic development measured as LogGDP as a dependent variable, using COR and SE as independent variables, in turn (Models (1) and (2), respectively. Table A2a uses the entire sample of 185 countries, for the entire eleven-year time period. Then, Table A2b models LogGDP as a function of COR and SE in turn, also including time dummies for the subsamples of high-income countries and low-income countries respectively (54 developed countries and 131 developing countries detailed in Table A1, Appendix A). Furthermore, sustainable development, expressed as HDI, is explicated as a function of COR and SE, using crisis dummy variables as well, in Table A3a, for all countries. Table A3b estimates HDI as a function of COR (Models (1)) and SE (Models (2)) for the two subsamples of high-income countries and low-income countries. Nonetheless, EPI is used as a sustainable development measure and it is estimated as a function of COR (Models (1)) and as a function of SE (Models (2)) for the entire sample of 185 countries in Table A4a and the two subsamples of high-income and low-income countries in Table A4b from Appendix B.

Table A2a,b come with a log-linear model of LogGDP as a function of COR(Models (1)) and SE (Models (2)) for the entire sample of 185 countries (Table A2a) and the two subsamples of high and low-income countries (Table A2b).

In Table A2a, the literal interpretation of the estimated coefficient of COR is that a one-unit increase in COR will produce an expected increase in LogGDP of −0.0232 units. So, in terms of effects of changes in COR on untransformed per capita GDP (unlogged),we have that each one-unit increase of COR increases percapita GDP by a *multiple* of $e^{-0.0232}$ = 0.97706, or a 2.2932% decrease. So, the lower the corruption ranking (increase in the rank position), the lower the per capita GDP of countries, with 2.2932% lower for each one rank increase. The explicative power of this first Pooled OLS model is of 57.04%, rather powerful. However, using the FEM method we have a positive coefficient of COR of 0.0023, significant at an only 10% threshold. This means that each one-unit increase in COR multiplies the expected value of GDP by $e^{0.0023}$ =1.002302 or a 0.23% increase. When we use REM method, the coefficient of corruption is also negative (like in the case of Pooled OLS) but is not statistically significant.

Concluding, when we analyze the total sample of the countries, we obtain mixed results about the way in which the size of corruption may impact economic development (expressed as LogGDP). Thus, two of the three used methods confirm our Hypothesis 1 (The higher the level of corruption, the lower the level of economic development). Thus, our Pooled OLS and REM results validate the findings of the "sand the wheels" supporters [1,2,5,12,14–16,18], documenting the destructive role of corruption upon economic development. A high level of corruption hampers the market entrance of new companies, further diminishing entrepreneurship [5] and thus reducing business development, being a major obstacle for economic growth [21]. Nonetheless, corruption affects the absorption of European funds [14], new investment opportunities [1,13], the efficiency of fiscal policies [15–18] and finally, it affects economic growth.

On the other hand, the results of our FEM model reject our Hypothesis 1, documenting the "grease the wheels" role of the corruption upon economic growth. There is also a large strand in literature which supports our findings [8–10]. Thus, an increase incorruption may increase the profitability of firms, especially in countries with low government regulation and low quality of governance [8]. This is the case of several countries such as China, Vietnam and Cambodia which have a high economic growth while their level of governance is rather weak [6,8–10,26]. Further, we proceed to analyze the impact of corruption upon economic development separately among the two subsamples of countries and therefore our first results from Table A2a will be better explained.

Table A2b contains results on subsamples of countries. The data from Table A2b are used to find the answers for our two research questions, namely Research question 1. (How does the impact of corruption upon economic development differ among high-income and low-income countries?) and Research question 3. (How does the impact of the shadow economy upon economic development differ among high-income and low-income countries?). Table A2b contains the results for the estimation of LogGDP as a function of COR (Models (1)) and SE (Models (2)), respectively, for the high-income countries (left part) and for the low-income countries (right part). The right part of Table A2b deals with the subsample of low-income countries. This subsample contains 131 countries out of the total 185 analyzed states, so 70.81% of our entire sample consists of developing countries. These coefficients somehow resemble the results we obtained in Table A2a, for the entire sample.

Regarding the impact of corruption on economic development among the two subgroups of countries, we notice that both coefficients of COR from the Pooled OLS results are negative and significant at a 1% threshold. For high-income countries, the −0.0111 coefficient of COR, significant at a 1% threshold, is interpreted as follows: each one-unit increase of COR increases percapita GDP by a *multiple* of $e^{-0.0111}$ = 0.98896 or a 1.1038% decrease. The Adj R^2 is of 0.3107 on the Pooled OLS estimation technique.

For low-income countries, the coefficient of COR is −0.0126 and it is significant at a 1% threshold. In terms of effects of changes in COR upon per capita GDP (unlogged), we find that each one-unit increase of COR increases percapita GDP by a multiple of $e^{-0.0126}$ =0.98747 or a 1.26% decrease. The Adj R^2 for this Pooled OLS model is of 21.11%.

Hausman test points towards FEM as the optimal estimation technique. For high-income countries, one may see that the coefficient of COR is not significant on FEM. However, for low-income countries, the FEM model shows that the coefficient of COR is0.0024, positive and significant at a 10% threshold.

Basically, each one-unit increase in COR multiplies the expected value of GDP by $e^{0.0024}$ =1.002402 or a 0.2402% increase. Thus, we get supplementary evidence for a positive impact of corruption upon the level of development faced by low-income countries.

In order to respond to our research question (Research question 1. How does the impact of corruption upon economic development differ among high-income and low-income countries?), we may conclude that the negative effects of corruption on economic development are more pronounced in high-income countries (the Adj R^2 for the Pooled OLS model is of 0.3107) compared to low-income countries (the Adj R^2 for the Pooled OLS model is of only 0.2111). We see that in low-income countries, the negative impact of corruption is diminished compared to high-income countries, and we even find positive effects of corruption upon the level of state development (through the use of FEM). Thus, we may sum up on a rather mixed role of the size of corruption on the economic development of low-income countries while for the high-income countries' subsample we have clear evidence of a negative relationship. Thus, for low-income countries with weaker governance than high-income countries, corruption may help firms avoid government regulations and therefore their profitability enhances. These positive influences are also validated by the literature research among the supporters of the "grease the wheels" idea [4,6,8,26].

To continue with Models (2), for the case of shadow economy we may find negative and significant coefficients in all the three models from Table A2a. Thus, the literal interpretation of the estimated coefficient of SE in the Pooled OLS is that a one-unit increase in SE will produce an expected increase in logGDP of −0.0887 units. So, in terms of effects of changes in SE on untransformed GDP, we have that each one-unit increase of SE increases percapita GDP by a multiple of $e^{-0.0887}$ =0.91512, or an 8.4879% decrease. So, the increase in the shadow economy determines the decrease in economic development. The explicative power of this Pooled OLS model is strong, having an R^2 of 47.82%. Moreover, the panel diagnosis tests point towards FEM as the optimal estimation technique. For FEM, the coefficient of SE is of −0.0547. Basically, each one-unit increase in SE multiplies the expected value of GDP by $e^{-0.0547}$ =0.9467 or a 5.32% decrease. Thus, all the run tests applied for the entire sample document a negative and significant coefficient of SE in relation to LogGDP. Therefore, our finding supports the idea that the higher the shadow economy, the lower the economic development and thus our hypothesis (Hypothesis 3. The higher the level of shadow economy the lower the level of economic development) is accepted. Our findings are in line with the "sand the wheels" literature strand regarding the negative influence of the shadow economy on economic development [24,25]. Underground activities come along with tax payments avoidance further decreasing the income of the state. The state would need these incomes in order to support its public investments, to cover the expenses of public institutions, to support the development of the national economy and to cover healthcare, education and citizens' protection expenditures. All these may finally hamper productivity and growth [25]. A decrease in the state's income will lead to a reduction of its financial power, which is necessary in order to ensure the normal functioning of state institutions and authorities. The effects of fiscal evasion will be felt both by the honest taxpayers and by the ones that avoid these compulsory payments.

From Table A2b we find that the negative influence of the level of shadow economy upon economic development is maintained among both groups (high-income and low-income countries, Models (2)). When SE is used as an independent variable for estimating LogGDP of developed countries, the coefficients of SE are almost identical regardless of the estimation technique. The −0.0444 coefficient of SE from the Pooled OLS Model (2), significant at a 1% threshold, is interpreted as follows: each one-unit increase of SE increases percapita GDP by a multiple of $e^{-0.0444}$ =0.95657, or a 4.3428% decrease. The Adj R^2 is of 0.3251 on the Pooled OLS estimation technique, so SE explicates 32.51% of economic development for the high-income countries' subsample. Furthermore, the Hausman test points towards REM as the optimal estimation technique in the regression of LogGDP against SE for high-income countries.

For the low-income countries' subsample, we estimate that each one-unit increase of SE increases percapita GDP by a *multiple* of $e^{-0.0375}$ =0.96319, or a 3.68% decrease. So, the increase in the shadow economy actually determines the decrease in economic development. The Adj R^2 for this Pooled OLS model is of 12.88%. Moreover, the panel diagnosis tests point towards REM as the optimal estimation technique. For REM, the coefficient of SE is of −0.0551, significant at a 5% threshold. Basically, each one-unit increase in SE multiplies the expected value of GDP by $e^{-0.0551}$=0.94639 or a 5.36% decrease. The higher the weight of the shadow economy, the lower the economic development.

Concluding, to respond to our research question (Research question 3. How does the impact of shadow economy upon economic development differ among high-income and low-income countries?), just like in the case of corruption, we may state that the negative effects of shadow economy on economic development are more pronounced in high-income countries (Adj R^2 for the Pooled OLS model is of 0.3251) compared to low-income countries (Adj R^2 for the Pooled OLS model is of 0.1288). In other words, for high-income countries, the negative effects of shadow activities upon economic development are higher than in the case of low-income countries. Our results are somehow in line with the findings of Williams [52], Zaman and Goschin [11], and Ruzek [27] who document that informal activities represent an important buffer for solving many economic problems especially for the less developed countries. Thus, if in developed countries the informal economy can be a choice, in less developed countries it is out of economic necessity [27,52]. Thus, for low-income countries, the negative effects of the shadow economy are significantly diminished, which is in line with our findings.

Regarding the effects of the 2008 economic and financial crisis we validate the effects it induced upon worldwide economic and sustainable development. Most countries have registered a decline of their economies in 2008, 2009, or 2010, the latest, as post-crisis effects. In order to capture the influence of aggregate (time-series) trends, we included time dummies for 2008, 2009, and 2010 in all our regressions, keeping the significant ones as results. The coefficients of the 2008, 2009, and 2010 time dummy variables are mainly significant in the regressions from Table A2a. The effects of the crisis upon the per capita GDP dependent variable were delayed in low-income countries, thus the coefficients for the time dummies are significant only for 2009 and 2010 in Table A2b. The significant coefficients of these dummy variables point out the fact that in the crisis years there always were hindering effects for development.

Table A3 in Appendix B estimate linear models of Human development index (HDI) as a function of COR Models (1)) and SE (Models (2)) for the entire sample of 185 countries (Table A3a) and the two subsamples of high-income and low-income countries (Table A3b).

In Table A3a, the interpretation of the −0.0023 estimated coefficient of COR is the change in HDI for a one-unit change in COR. So, we have that each one-unit increase of COR (a lower ranking in Corruption) decreases the HDI of countries by 0.0023 points, on average, everything else unchanged, thus hindering human development. The explicative power of this first Pooled OLS model is 53.46%, rather powerful. Moreover, the panel diagnosis tests point towards FEM as the optimal estimation technique. However, the coefficient of COR is positive but non-significant on FEM. Thus, the significant Pooled OLS results bring evidence on a negative effect of corruption upon the HDI. Our results confirm the “sand the wheels” theory, documenting the destructive role of corruption not only upon the economic but also upon the sustainable development of worldwide countries. Thus, our findings are in line with those of Absalyamova et al. [22] and Forson et al. [23] who find a negative influence of the size of corruption upon the sustainable development of states. The study of Absalyamova et al. [22] finds that a 1% increase in the corruption of the socio-economic system of the state causes a reduction by more than 1% of the value of the human capital sustainable development index (HCSDI). In addition, the study conducted for 22 Sub-Sahara African countries by Forson et al. [23] finds that corruption affects the sustainable development of these economies in the long term.

Table A3b works on subsamples of countries. The left part of this table contains the results for the estimation of HDI as a function of COR (Models (1)) and SE (Models (2)), respectively, for the high-income countries’ subsample. The −0.0114 coefficient of COR, significant at a 1% threshold from Model (1) is interpreted as follows: each one-unit increase of COR decreases HDI by 0.0014 units, on average, everything else unchanged. The Adj R^2 is of 0.5826 on the Pooled OLS estimation technique.

Although the Hausman test points towards FEM as the optimal estimation technique, the positive coefficient of COR is not significant on FEM. The right part of Table A3b deals with the subsample of low-income countries. In terms of effects of COR on HDI, we obtain a 0.0015 decrease in HDI for a one-unit increase in COR, significant at 1%. The Adj R^2 for this Pooled OLS model is of 19.54%. Moreover, the panel diagnosis tests point towards FEM as the optimal estimation technique for COR, but the positive coefficient of COR is not significant.

To respond to our research question (Research question 2. How does the impact of corruption on sustainable development differ among high-income and low-income countries?) we may conclude that the negative effects of corruption upon the sustainable development of states are much more pronounced in high-income countries (the Adj R^2 for the Pooled OLS model is of 0.5826) compared to low-income countries (the Adj R^2 for the Pooled OLS model is of 0.1954). Accordingly, we may see that in low-income countries, the negative impact of corruption is highly diminished compared to high-income countries.

For the case of SE, we obtain clear evidence on the negative effects of the shadow economy upon the sustainable development of worldwide countries in all the three models from Table A3a (Models (2)). We obtain that each one-unit increase of SE decreases HDI by 0.0088 units, on average, everything else unchanged. The explicative power of this Pooled OLS model is of 42.63%. Moreover, the panel diagnosis tests point towards FEM as the optimal estimation technique. For FEM, the coefficient of SE is of −0.0101. Basically, each one-unit increase in SE determines a 0.0101 unit decrease in HDI. So, the increase of the shadow economy phenomenon determines the decrease of countries' sustainable development which is in line with the supporters of the "sand the wheels" literature strand. The document that working in the shadow leads towards a decrease in the incomes of a state, further diminishing the ability of the state to provide public goods and services for its citizens, such as healthcare, education and protection and security services [53] (p. 332). In order to respond to our research question (Research question 4. How does the impact of the shadow economy on sustainable development differ among high-income and low-income countries?),we analyze the results provided by Table A3b. In both subgroups of countries, we find a negative and significant influence of shadow economy upon sustainable development (through all the three estimation methods). We may also remark that the negative impact of the shadow economy upon the HDI is much more pronounced for high-income countries (the Adj R^2 for the Pooled OLS model is of 0.4046) compared to low-income countries (the Adj R^2 for the Pooled OLS model is of 0.106). We may see that in low-income countries the negative impact of shadow economy upon sustainable development (expressed by HDI) is highly diminished. Our results are in line with the findings of Williams [52], Zaman and Goschin [11] and Ruzek [27] who document the positive role held by shadow activities for solving many economic problems especially in developing countries, and therefore for finding the proper channels to increase the level of sustainable development.

The time dummies for 2008, 2009 and 2010 considered in our regressions point towards a rather immediate effect of the crisis upon sustainable development. The coefficients of the 2008 and 2009 time dummy variables are mainly significant in the regressions from Table A3a. In Table A3b, we obtain significance for almost all 2008 dummy variables.

Table A4a,b from Appendix B use EPI as another sustainable development proxy. The independent variables are COR (Models (1)) and SE (Models (2)) respectively. Table A4a contains the estimations for the entire sample of 185 countries while Table A4b works with the two subsamples of high-income and low-income countries. The results of using EPI as another proxy indicator for sustainable development are highly similar to the previous results. Thus we find a negative and significant influence of the corruption and shadow economy on the level of EPI: as COR rankings increase, EPI decreases on average with 0.2182 units, all other things equal. Then, in Models (2), for the case of SE, we obtain negative and significant coefficients of SE regardless of the estimation technique. When SE increases with one unit, EPI is higher on average by −0.7926, so we have a decrease of 0.7926 units. Basically, the increase of the shadow economy determines the decrease of sustainable development, reflected by EPI.

The amount of variance in EPI explained by COR and SE is of more than 43% and 34% respectively, so the predictive accuracy of these models is good.

When the influences of corruption and shadow economy upon EPI are analyzed among the two subgroups of countries we also find negatives influences among the two groups. Table A4b contains the estimations of the impact of COR (Models (1)) and SE (Models (2)) upon EPI for high-income countries on the left and low-income countries on the right. For both sets of countries, COR has a negative relationship with EPI. For high-income countries, when EPI is estimated as a function of COR, COR has a negative and significant coefficient of −0.1875, so each one-unit increase of COR decreases EPI by approximatively 0.19 units, all other things equal. The Adj R^2 is of 0.2178 on the Pooled OLS estimation technique. Although the Hausman test points towards FEM as the optimal estimation technique, the positive coefficient of COR is not significant on FEM. For REM, the coefficient of COR is still negative and significant. In Models (2), for high-income countries, we obtain a −0.7544 coefficient of SE, significant at a 1% threshold, so each one-unit increase of SE decreases EPI by 0.75 units. The Adj R^2 is of 0.2257 on the Pooled OLS estimation technique, so we obtain that 22.57% of the amount of variance in EPI is explained by COR.

The right part of Table A4b deals with the subsample of low-income countries. The relationship between EPI on the one hand and COR and SE, on the other hand, is negative, pointing out the indirect relationship between them. As such, for low-income countries, a one-unit increase in COR decreases EPI by 0.122 units, all other things equal (Pooled OLS). The predictive accuracy of this model shows that 13.14% of the variance in EPI is explicated by COR. Despite the fact that the Hausman test decides that FEM is the optimal estimation technique, the coefficient of COR (0.0189) is not significant here. When SE is used as an exogenous variable for the estimation of EPI, its coefficient is of −0.2736, so for each additional unit in SE, EPI is lower on average by 0.2736. The REM coefficient is also negative and significant at a 1% threshold, so for each additional unit in SE, EPI is actually lower on average by 0.4383.

Summing up, as in the case of HDI, we also find that the negative effects of the corruption and shadow economy upon EPI are more pronounced in high-income countries than in low-income countries (the value of Adj R^2 for the Pooled OLS models are significantly higher in the case of high-income countries than in the case of low-income countries, both for COR and SE).

The time dummy for the 2008 crisis is always significant for the two subsamples of countries. Most models from Table A4b validate the 2009 and 2010 time dummies as well, so the effects of the crisis and post-crisis years are present here as well.

5. Robustness Checks

The stability and reliability of our results have been checked by analysing the impact of the shadow economy and corruption upon The Global Sustainability Competitiveness Index (GSCI), having the support of previous literature findings. The Global Sustainability Competitiveness Index (GSCI)aims to evolve a broader picture of competitiveness that incorporates the essential pillars of an economy to enable sustainable economic growth and wealth [54]. It measures the competitiveness of countries in an integrated way. It is calculated based on 111 measurable, quantitative indicators which are grouped into 5 sub-indexes, namely Natural Capital, Resource Efficiency and Intensity, Intellectual Capital, Governance Efficiency, and Social Cohesion. The Index is purely based on quantitative indicators, therefore excluding any subjectivity. It can be used as an alternative to the GDP, international credit ratings, as a measure of "green growth", and sustainable development. This index has been published annually since 2012 [54]. Due to data unavailability, the time interval for the data from Tables A4 and A5 is restricted to 2011–2015 (5 years). For the 2011–2015 time period, GSCI ranges from 25 (Yemen, 2011) to 62.8 (top values are registered by the Northern European countries), with a mean value of 42.1.

Table A5 in Appendix C contains robustness checks for the Global Sustainability Competitiveness Index as the dependent variable and corruption as an independent variable. Data cover the 2011–2015 time intervals because the first release of GSCI was issued in 2012 for the year 2011. Unfortunately, due to this reduced time period, the year dummies for crisis effects cannot be considered. The entire sample contains 185 countries, further split into the two subsamples of high-income countries (54 developed countries) and low-income countries (131 developing countries, detailed in Table A1, Appendix A). The correlation coefficient of GSCI with SE is of −0.6022 so a moderate to strong negative linear relationship exists. These reduced panel data were analyzed with the Pooled OLS technique, the fixed-effects model and the random-effects model, with robust standard errors each time. The optimal estimation technique, decided based on the results of the Hausman test, is bolded out each time. The results confirm the indirect relationship between COR and GSCI: at a one-unit increase of corruption rankings, GSCI decreases with 0.0767 points on average, everything else unchanged, for the entire sample of countries. The decrease of GSCI is stronger for high-income countries, of 0.1075 points, and there's a lighter decrease of 0.0384 points for low-income countries. A negative and significant coefficient of COR is obtained for the entire sample of countries and the two subsamples of countries as well. The medium explicative power of the model for the entire sample (Adj R^2 = 0.3618) is also validated by the high-income countries' subsample (Adj R^2 = 0.2168), while for the low-income countries' subsample a weak explicative power is obtained through the Pooled OLS method (Adj R^2 = 0.1046). The optimum estimation technique is that of a random-effects model (GLS) and the coefficients of COR are still negative and significant for the worldwide sample and the two subsamples respectively.

Table A6 from Appendix C contains robustness checks for GSCI as a dependent variable and shadow economy as an independent variable, for the 2011–2015 time interval, for the worldwide sample of 185 countries and the two subsamples of high-income countries and low-income countries (detailed in Table A1). The correlation coefficient of GSCI with SE is of −0.5547 so a moderate to strong negative linear relationship exists. These reduced panel data were analyzed with the Pooled OLS technique, the fixed-effects model and the random-effects model, with robust standard errors each time. The F-test and Breusch-Pagan test lead towards the Hausman test in order to decide between the FEM and REM, as the optimum estimation technique, further bolded out. A negative and significant coefficient of SE is obtained regardless of the sample for the Pooled OLS method, so an increase in a country's shadow economy further determines a decrease of its GSCI, with 0.3001 points for the entire sample, 0.4478 points for the high-income countries' subsample and 0.0986 points for the low-income countries' subsample, everything else unchanged. 30.67% of the variance in GSCI is explained by the shadow economy for the entire sample of countries.

Concluding, our robustness checks applied for corruption and shadow economy confirm our previous results documenting a negative and significant role of corruption and shadow economy upon the sustainable development (expressed by GSCI) of states. In addition, we find that the sustainable development expressed as GSCI in the case of high-income countries is stronger affected by both corruption and shadow economy than in the case of low-income countries (we obtain higher values for all their coefficients, high-income countries versus low-income).

6. Conclusions

The first main contribution of this work consists of finding general and empirical evidence for the destructive role of the size of corruption and shadow economy upon the economic and sustainable development of worldwide countries. In general, our findings are in line with the supporters of the "sand the wheels" theory [1,5,14,21,23] documenting a negative relationship between corruption and shadow economy on the one hand, and economic and sustainable development on the other hand. Basically, our main econometric models, further supported by robustness checks, estimate the negative impact of corruption and shadow economy upon economic prosperity (LogGDP) and sustainable development (HDI and EPI) of states, in general (the entire sample of 185 worldwide countries). In addition to these, we find that the economic and sustainable development of high-income countries is stronger and negatively affected by the phenomena of corruption and shadow economy than in the case of low-income countries. Thus, for low-income countries, where the governance is weaker than in high-income countries, corruption and shadow economy may help firms to avoid government regulations, to solve many economic problems and thus, they "grease the wheels". This way, the negative effect of corruption and shadow economy is reduced for low-income countries.

Moreover, we also find little evidence for a positive role of corruption upon the level of economic development (positive and significant coefficients of GDPpercapita), especially for low-income countries. Thus, for poorer countries, we have another reason so that corruption can be also seen as a way to circumvent the law in order to achieve higher economic benefits. Therefore, the "grease the wheels" theory is again at play for these low-income countries. However, despite these empirical findings which point out a very weak positive influence of corruption and economic growth, still, we should not promote the false perception that governance does not matter that much for economic performance [55].

We also find that corruption and shadow economy are poverty-driven diseases and they highly characterize low-income countries. Thus, the higher sizes of corruption and shadow economy are correlated with low levels of economic and sustainable development. Unfortunately, the unwanted phenomena of corruption and shadow economy are spread within developing economies, which struggle hard to reduce their evolution.

It should be noted that this research may have political implications for government institutions that need to adopt the best-required policies, in order to increase both the economic and sustainable development of states. As regards low-income countries, where we find some evidence of the positive effects of corruption and shadow economy upon economic and sustainable development, the immediate practical implication is not to encourage but to effectively and strongly fight against these destructive phenomena and find the proper channels to increase the institutional quality and to adopt the appropriate regulatory policies.

Our research has some limitations. We have only analyzed the relationship between corruption and shadow economy on the one hand and economic and sustainable development, on the other hand, only considering the moderating effect of the economic crisis. Still, no other control variables are used, which may distort the final results. In order to substantiate our findings for our future studies, we intend to overpass these limits. Potential control variables might come from the field of foreign direct investments, research and development expenditures as a technological proxy, population employment ratios, the Human Capital Index recently published by the World Bank and others. We might even analyze the underlying relationship between the two main explanatory variables of this paper: corruption and the shadow economy. Another promising research direction would focus on explicating corruption and shadow economy as a function of several explanatory variables from the economic and sustainable development field. Interest findings might then arise from testing the causality between corruption and shadow economy on the one hand and economic and sustainable development on the other hand.

Author Contributions: Conceptualization, R.H., M.V.A. and S.N.B.; formal analysis: D.B., V.L.V.; methodology: V.L.V., M.V.A.; resources, R.H., D.B., S.N.B., V.L.V., M.V.A.; writing—original draft, M.V.A., V.L.V.; writing—review & editing, R.H., D.B., S.N.B., V.L.V. and M.V.A. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A Description of Subsamples of Countries

Table A1. Sample countries classified as 'developed' and 'developing'.

Developed Countries (*High-Income Countries*) (54)	**High Income (54)**	Australia, Brunei New Zealand, Singapore, South Korea, Austria, Czech Republic, Denmark, Ireland, Italy, Israel, Qatar, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, UK, Bahamas, Puerto Rico, Trinidad and Tobago, Uruguay Kuwait, Malta, Saudi Arabia, United Arab Emirates, USA, Hong Kong, Japan, Belgium, Croatia, Cyprus, Estonia, Finland, France, Germany, Greece, Iceland, Luxembourg, Barbados, Chile, Bahrain, Oman, Canada, Macao, Taiwan, Equatorial Guinea
Developing Countries (*Low-Income Countries*) (131)	**Upper Middle Income (50)**	Albania, Algeria, Angola, Argentina, Azerbaijan, Belarus, Belize, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, Gabon, Grenada, Hungary, Iran, Iraq, Jamaica, Jordan, Kazakhstan, Lebanon, Libya, Macedonia, Malaysia Maldives, Mauritius, Mexico, Montenegro, Namibia, Panama, Peru, Romania, Saint Lucia, Saint Vincent and the Grenadines, Serbia, Seychelles, South Africa, Suriname, Thailand, Tonga, Tunisia, Turkey, Turkmenistan, Venezuela.
	Lower Middle Income (47)	Armenia, Bhutan, Bolivia, Cambodia, Cameroon, Cape Verde, Congo Republic, Côte d´Ivoire, Djibouti, Egypt, El Salvador, Georgia, Ghana, Guatemala, Guyana, Honduras, India, Indonesia, Kiribati, Kosovo, Kyrgyzstan, Laos, Lesotho, Mauritania, Moldova, Mongolia, Morocco, Nicaragua, Nigeria, Pakistan, Papua New Guinea, Paraguay, Philippines, Samoa, Sao Tome and Principe, Senegal, Sri Lanka, Sudan, Swaziland, Syria, Timor-Leste, Ukraine, Uzbekistan, Vanuatu, Vietnam, Yemen, Zambia.
	Low Income (34)	Afghanistan, Bangladesh, Benin, Burkina Faso, Burundi, Central African Republic, Chad, Comoros, Congo Democratic Republic, Eritrea, Ethiopia, Haiti, Kenya, Korea (North), Gambia, Guinea, Guinea-Bissau, Liberia, Madagascar, Malawi, Mali, Mozambique, Myanmar, Nepal, Niger, Rwanda, Sierra Leone, Somalia, South Sudan, Tajikistan, Tanzania, Togo, Uganda, Zimbabwe.

Appendix B Main Results

Table A2. (**a**) The Estimation of Economic and Sustainable Development measured as LogGDP. Robust (HAC) standard errors, simple regressions, the entire sample. (**b**) The Estimation of Economic and Sustainable Development measured as LogGDP. Robust (HAC) standard errors, simple regressions, high-income countries' subsample and low-income countries' subsample.

(a)						
LogGDP	**(1)**			**(2)**		
	Pooled OLS	**Fixed-Effects**	**Random-Effects (GLS)**	**Pooled OLS**	**Fixed-Effects**	**Random-Effects (GLS)**
Const	10.4578***	8.2927***	8.5432***	11.0640***	10.0848***	10.1502***
Corruption	−0.0232***	0.0023*	−0.0009			
Shadow economy				−0.0887***	−0.0547***	−0.0573***
Dummy_2008	0.0654***					
Dummy_2009		−0.0721***	−0.0596***	0.0981***	0.0316**	0.0359***
Dummy_2010		0.0238***	0.0298***	0.0805***	0.0605***	0.0618***
	R^2 = 0.5709	LSDV R-squared = 0.9752	'Between' variance = 0.8885	R^2 = 0.4782	LSDV R-squared = 0.9836	'Between' variance = 1.2901
	Adj R^2 = 0.5704	Within R-squared = 0.0181	'Within' variance = 0.0652	Adj R^2 = 0.4773	Within R-squared = 0.3002	'Within' variance = 0.0456
No obs.		1811			1665	
Decision	H = 290.596 with *p*-value = prob(chi-square(2) > 290.596) = 7.90651 × 10^{-64}, in favour of **FEM**			H = 22.3252 with *p*-value = prob(chi-square(3) > 22.3252) = 5.58162 × 10^{-5}, in favour of **FEM**		

Table A2. *Cont.*

(b)												
LogGDP	**High-Income Countries**						**Low-Income Countries**					
	(1)			**(2)**			**(1)**			**(2)**		
	Pooled OLS	**Fixed-Effects**	**Random-Effects (GLS)**	**Pooled OLS**	**Fixed-Effects**	**Random-Effects (GLS)**	**Pooled OLS**	**Fixed-Effects**	**Random-Effects (GLS)**	**Pooled OLS**	**Fixed-Effects**	**Random-Effects (GLS)**
Const	10.6767***	10.2339***	10.3476***	11.1038***	11.1206***	11.1182***	9.0372***	7.42***	7.5880***	8.9061***	9.5517***	9.4946***
Corruption	−0.0111***	0.0022	−0.0011				−0.0126***	0.0024*	0.0009			
Shadow economy				−0.0444***	−0.0453***	−0.0452***				−0.0375***	−0.0565***	−0.0551**
Dummy_2008	0.0960***	0.0845***	0.0862***	0.0562***	0.0553***	0.0554***		−0.0438***	−0.0363**			
Dummy_2009	−0.0372**	−0.0607***	−0.0577***					−0.0787***	−0.0703***		0.0505***	0.048***
Dummy_2010								0.0338***	0.0382***		0.081***	0.0805***
	R^2 = 0.3144	LSDV R-squared = 0.9300	'Between' variance = 0.2227	R^2 = 0.3276	LSDV R-squared = 0.9453	'Between' variance = 0.23	R^2 = 0.2117	LSDV R-squared = 0.9348	'Between' variance = 0.7824	R^2 = 0.1296	LSDV R-squared= 0.9557	'Between' variance = 0.9764
	Adj R^2 = 0.3107	Within R-squared = 0.0433	'Within' variance = 0.0281	Adj R^2 = 0.3251	Within R-squared = 0.2698	'Within' variance = 0.0217	Adj R^2 = 0.2111	Within R-squared = 0.0206	'Within' variance = 0.0815	Adj R^2 = 0.1288	Within R-squared = 0.3106	'Within' variance = 0.057
No obs.		558			550			1253			1115	
Decision	H = 29.9069 with *p*-value = prob(chi-square(3) > 29.9069) = × 10^{-6} in favour of **FEM**			H = 0.0103508 with *p*-value = prob(chi-square(1) > 0.0103508) = 0.918964 in favour of **REM**			H = 59.4817 with p-value = prob(chi-square(1) > 59.4817) = 1.2344 × 10^{-14}, in favour of **FEM**			H = 3.65515 with *p*-value = prob(chi-square(1) > 3.65515) = 0.0558961 in favour of **REM**		

Source: Authors' processing. *Note:* *** designates the 1% significant coefficients, ** designates the 5% significant coefficients and * designates the 10% significant coefficients.

Table A3. (**a**) The Estimation of Economic and Sustainable Development, measured as Human development index (HDI).Robust (HAC) standard errors, simple regressions, the entire sample. (**b**)The Estimation of Economic and Sustainable Development, measured as Human development index (HDI). Robust (HAC) standard errors, simple regressions, high-income countries' subsample and low-income countries' subsample.

(a)						
HDI	**(1)**			**(2)**		
	Pooled OLS	**Fixed-Effects**	**Random-Effects (GLS)**	**Pooled OLS**	**Fixed-Effects**	**Random-Effects (GLS)**
Const	0.8833***	0.6796***	0.6871***	0.9381***	0.8019 ***	0.8065***
Corruption	−0.0023***	0.00002	−0.0001			
Shadow economy				−0.0088***	−0.0041***	−0.0043***
Dummy_2008		−0.0097***	−0.0093***	−0.0092***	−0.0101***	−0.0101***
Dummy_2009		−0.0059***	−0.0055***	0.0085***		
Dummy_2010	0.0041*			0.0035**		
	R^2 = 0.5351	LSDV R-squared = 0.9877	'Between' variance = 0.0116	R^2 = 0.4277	LSDV R-squared = 0.9914	'Between' variance = 0.0157
	Adj R^2 = 0.5346	Within R-squared= 0.0298	'Within' variance = 0.0003	Adj R^2 = 0.4263	Within R-squared = 0.322	'Within' variance = 0.0002
No obs.		1816			1700	
Decision	H = 207.907 with *p*-value = prob(chi-square(2) > 207.907) = 7.13725 × 10^{-46} in favour of **FEM**			H = 34.1474 with *p*-value = prob(chi-square(2) > 34.1474) = 3.84583 × 10^{-8} in favour of **FEM**		

Table A3. *Cont.*

(b)												
	High-Income Countries						**Low-Income Countries**					
HDI	**(1)**			**(2)**			**(1)**			**(2)**		
	Pooled OLS	**Fixed-Effects**	**Random-Effects (GLS)**	**Pooled OLS**	**Fixed-Effects**	**Random-Effects (GLS)**	**Pooled OLS**	**Fixed-Effects**	**Random-Effects (GLS)**	**Pooled OLS**	**Fixed-Effects**	**Random-effects (GLS)**
Const	0.9049 ***	0.8559***	0.8669***	0.9444***	0.9043***	0.9083***	0.7691***	0.6038***	0.609***	0.7437***	0.75***	0.7496***
Corruption	−0.0014***	0.00002	−0.0003				−0.0015***	0.00002	−0.00001			
Shadow economy				−0.0049***	−0.0027***	−0.0029***				−0.0042***	−0.0044***	−0.0044***
Dummy_2008	−0.0053***	−0.0061***	−0.006***	−0.0099***	−0.0081***	−0.0083***		−0.0113***	−0.0111***	−0.0101***	−0.0104***	−0.0104***
Dummy_2009	−0.0042***	−0.0058***	−0.0055***		−0.0025***	−0.0023***		−0.0061***	−0.0059***			
Dummy_2010		−0.0016**	−0.0016 **									
	R^2 = 0.5849	LSDV R-squared = 0.9586	'Between' variance = 0.0013	R^2 = 0.4068	LSDV R-squared = 0.9672	'Between' variance = 0.002	R^2 = 0.196	LSDV R-squared = 0.9769	'Between' variance = 0.0133	R^2 = 0.1076	LSDV R-squared = 0.9837	'Between' variance = 0.016
	Adj R^2 = 0.5826	Within R-squared = 0.0358	'Within' variance = 0.0001	Adj R^2 = 0.4046	Within R-squared = 0.1894	'Within' variance = 0.0001	Adj R^2 = 0.1954	Within R-squared = 0.0309	'Within' variance = 0.0004	Adj R^2 = 0.106	Within R-squared = 0.351	'Within' variance = 0.0003
No obs.		545			550			1271			1150	
Decision	H = 68.6927 with *p*-value = prob(chi-square(3) > 68.6927) = 8.13129 × 10^{-15} in favour of **FEM**			H = 6.50989 with *p*-value = prob(chi-square(1) > 6.50989) = 0.0107276 in favour of **FEM**			H = 35.9574 with *p*-value = prob(chi-square(1) > 35.9574) = 2.01683 × 10^{-9}, in favour of **FEM**			H = 0.242071 with *p*-value = prob(chi-square(2) > 0.242071) = 0.886002 in favour of **REM**		

Source: Authors' processing. *Note:* *** designates the 1% significant coefficients, ** designates the 5% significant coefficients and * designates the 10% significant coefficients.

Table A4. (**a**) The Estimation of Economic and Sustainable Development, measured as Environmental performance index (EPI). Robust (HAC) standard errors, simple regressions, the entire sample. (**b**) The Estimation of Economic and Sustainable Development, measured as Environmental performance index (EPI). Robust (HAC) standard errors, simple regressions, high-income countries' subsample and low-income countries' subsample.

(**a**)						
EPI	**(1)**			**(2)**		
	Pooled OLS	**Fixed-Effects**	**Random-Effects (GLS)**	**Pooled OLS**	**Fixed-Effects**	**Random-Effects (GLS)**
Const	69.2211***	49.3478***	59.5931***	73.9634***	61.893***	68.8388 ***
Corruption	−0.2182***	0.0131	−0.1087***			
Shadow economy				−0.7926***	−0.381**	−0.622**
Dummy_2008	0.6525*					
Dummy_2009	0.9577**		0.5285*	1.4381***	0.9039***	1.215***
Dummy_2010	0.8111**		0.6151**	0.8344***	0.7651***	0.804***
	R^2 = 0.4364	LSDV R-squared = 0.8159	'Between' variance = 115.956	R^2 = 0.3423	LSDV R-squared = 0.8194	'Between' variance = 126.982
	Adj R^2 = 0.4349	Within R-squared = 0.0004	'Within' variance = 58.2328	Adj R^2 = 0.3409	Within R-squared = 0.016	'Within' variance = 57.245
No obs.		1474			1381	
Decision	H = 85.5988 with *p*-value = prob(chi-square(4) > 85.5988) = 1.13223 × 10^{-17} in favour of **FEM**			H = 14.8036 with *p*-value = prob(chi-square(2) > 14.8036) = 0.000610163 in favour of **FEM**		

(**b**)												
	High-Income Countries						**Low-Income Countries**					
EPI	**(1)**			**(2)**			**(1)**			**(2)**		
	Pooled OLS	**Fixed-Effects**	**Random-Effects (GLS)**	**Pooled OLS**	**Fixed-Effects**	**Random-Effects (GLS)**	**Pooled OLS**	**Fixed-Effects**	**Random-Effects (GLS)**	**Pooled OLS**	**Fixed-Effects**	**Random-Effects (GLS)**
Const	71.6847***	64.9243***	69.8618***	79.2721***	55.7528***	73.9757***	57.1787***	41.7543***	47.1726***	52.9833***	63.3299***	58.5152***
Corruption	−0.1875***	0.0166	−0.1494***				−0.122***	0.0189	−0.0278*			
Shadow economy				−0.7544***	0.5387**	−0.4697***				−0.2736***	−0.5745***	−0.4383***
Dummy_2008	3.652***	3.183***	3.4113***	2.6765***	3.7044***	2.8878***	−0.9128**	−1.423***	−1.2449***	−1.1898***	−1.0997***	−1.06***
Dummy_2009	3.9266***	3.3761***	3.665***	4.3123***	2.9273***	3.9924***	−0.7312*	−1.2768***	−1.0872***	−0.633*		
Dummy_2010	4.0888***	3.722***	3.8615***	4.1734***	3.5953***	4.0311***	−0.8037**	−0.9408***	−0.8726***	−0.7364**		
	R^2 = 0.2248	LSDV R-squared = 0.6216	'Between' variance = 53.3006	R^2 = 0.2326	LSDV R-squared = 0.6012	'Between' variance = 46.109	R^2 = 0.1348	LSDV R-squared = 0.7253	'Between' variance = 107.561	R^2 = 0.0523	LSDV R-squared = 0.736	'Between' variance = 103.936
	Adj R^2 = 0.2178	Within R-squared = 0.0406	'Within' variance = 70.7438	Adj R^2 = 0.2257	Within R-squared = 0.053	'Within' variance = 72.736	Adj R^2 = 0.1314	Within R-squared = 0.0079	'Within' variance = 51.4123	Adj R^2 = 0.0482	Within R-squared = 0.0514	'Within' variance = 46.8788
No obs.		449			451			1025			930	
Decision	H = 24.992 with *p*-value = prob(chi-square(3) > 24.992) = 1.55002 × 10^{-5} in favour of **FEM**			H = 27.7698 with *p*-value = prob(chi-square(2) > 27.7698) = 9.32974 × 10^{-7} in favour of **FEM**			H = 23.3646 with *p*-value = prob(chi-square(4) > 23.3646) = 0.000107065, in favour of **FEM**			H = 5.76895 with *p*-value = prob(chi-square(2) > 5.76895) = 0.0558843, in favour of **REM**		

Source: Authors' processing. *Note:* *** designates the 1% significant coefficients, ** designates the 5% significant coefficients and * designates the 10% significant coefficients.

Appendix C Robustness Checks

Table A5. Robustness checks for GSCI as a function of Corruption (COR). Robust (HAC) standard errors.

GSCI	The Entire Sample			High-Income Countries			Low-Income Countries		
	Pooled OLS	**Fixed-Effects**	**Random-Effects (GLS)**	**Pooled OLS**	**Fixed-effects**	**Random-Effects (GLS)**	**Pooled OLS**	**Fixed-Effects**	**Random-Effects (GLS)**
Const	48.9376***	47.0725***	47.728***	51.3328***	50.2577***	50.3941***	44.1331 ***	45.7811***	44.2407***
Corruption	−0.0767***	−0.0553***	−0.0669***	−0.1075***	−0.07553***	−0.0962***	−0.0384***	−0.0533***	−0.0413***
	R^2 = 0.3625	LSDV R-squared = 0.8828	'Between' variance = 23.2837	R^2 = 0.22	LSDV R-squared = 0.8632	'Between' variance = 36.8468	R^2 = 0.1062	LSDV R-squared = 0.7966	'Between' variance = 14.1905
	Adj R^2 = 0.3618	Within R-squared = 0.0337	'Within' variance = 6.1245	Adj R^2 = 0.2168	Within R-squared = 0.0141	'Within' variance = 8.0074	Adj R^2 = 0.1046	Within R-squared = 0.0468	'Within' variance = 5.31959
No obs.	817			246			571		
Decision	H = 1.4165 with *p*-value = prob(chi-square(1) > 1.4165) = 0.23398 in favour of **REM**			H = 0.293443 with *p*-value = prob(chi-square(1) > 0.293443) = 0.588022 in favour of **REM**			H = 1.85992 with *p*-value = prob(chi-square(1) > 1.85992) = 0.172634, in favour of **REM**		

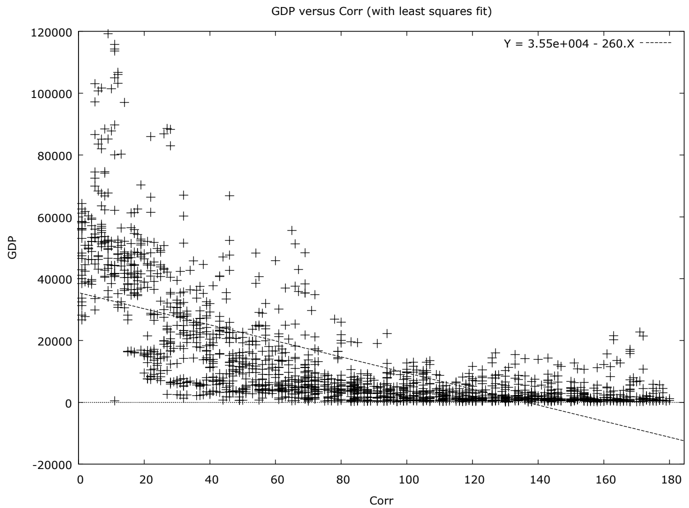
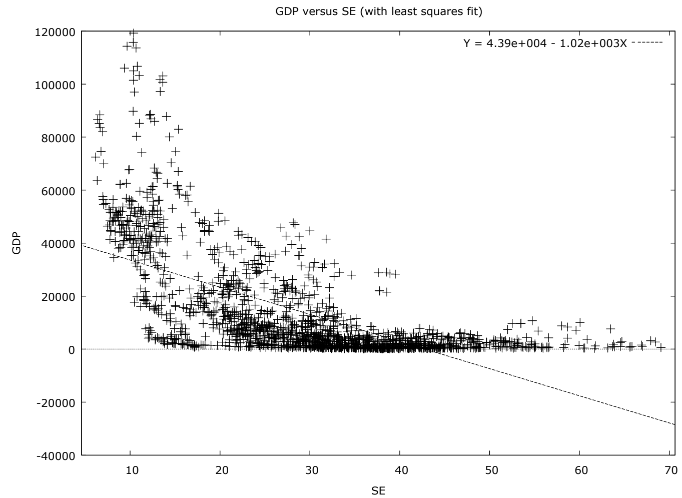
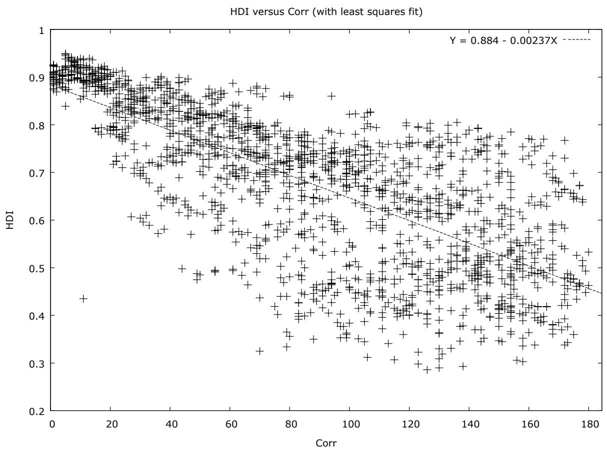
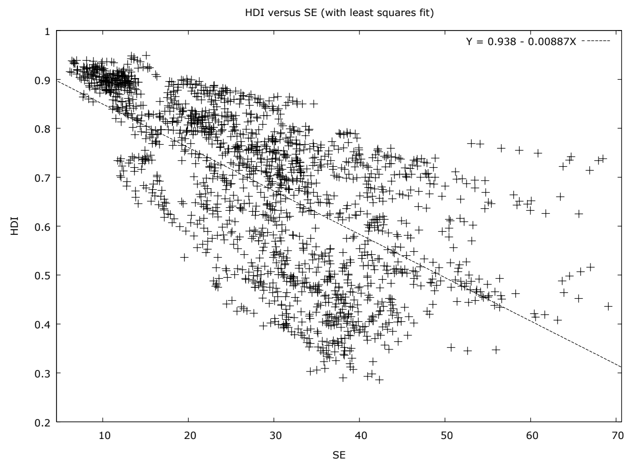
Source: Authors' processing. *Note:* *** designates the 1% significant coefficients, ** designates the 5% significant coefficients and * designates the 10% significant coefficient.

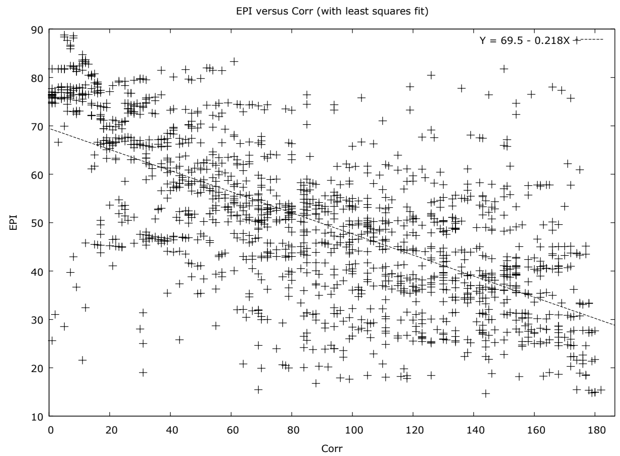
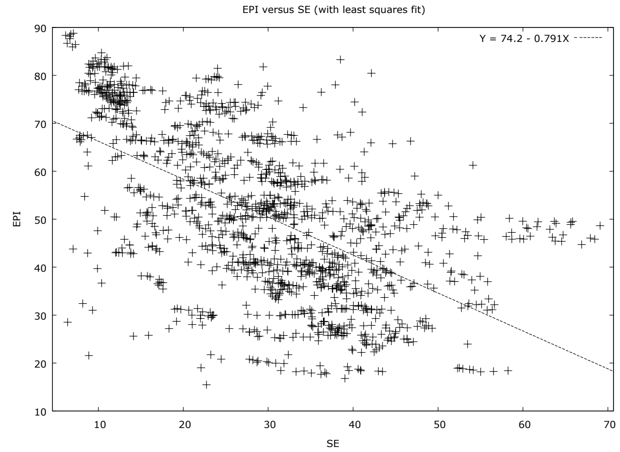
Table A6. Robustness checks for GSCI as a function of Shadow economy (SE), Robust (HAC) standard errors.

GSCI	The Entire Sample			HI Countries' Subsample			LI Countries' Subsample		
	Pooled OLS	**Fixed-Effects**	**Random-Effects (GLS)**	**Pooled OLS**	**Fixed-Effects**	**Random-Effects (GLS)**	**Pooled OLS**	**Fixed-Effects**	**Random-Effects (GLS)**
Const	50.9403***	46.2363***	49.8516 ***	55.5348***	36.5824***	52.4635***	43.3128 ***	47.3046 ***	44.4019***
Shadow economy	−0.3001***	−0.1316**	−0.2618***	−0.4478***	0.6383***	−0.2751***	−0.0986***	−0.2195***	−0.1315***
	R^2 = 0.3076	LSDV R-squared= 0.8725	'Between' variance = 21.9352	R^2 = 0.2782	LSDV R-squared = 0.856	'Between' variance = 25.2566	R^2 = 0.0481	LSDV R-squared = 0.7781	'Between' variance = 13.3079
	Adj R^2 = 0.3067	Within R-squared= 0.0076	'Within' variance = 6.5023	Adj R^2 = 0.2752	Within R-squared = 0.0438	'Within' variance = 8.0307	Adj R^2 = 0.0462	Within R-squared = 0.0325	'Within' variance = 5.48942
No obs.	763			249			514		
Decision	H = 5.9242 with *p*-value = prob(chi-square(1) > 5.9242) = 0.0149343 in favour of **FEM**			H = 22.5328 with *p*-value = prob(chi-square(1) > 22.5328) = 2.06589×10^{-6} in favour of **FEM**			H = 3.16691 with *p*-value = prob(chi-square(1) > 3.16691) = 0.0751446, in favour of **REM**		

Source: Authors' processing. *Note:* *** designates the 1% significant coefficients, ** designates the 5% significant coefficients and * designates the 10% significant coefficient.

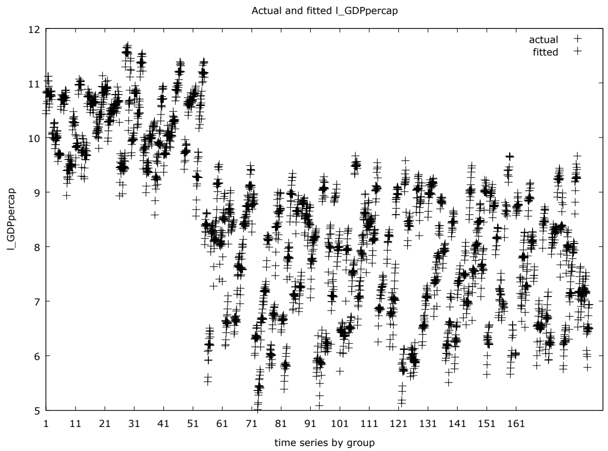
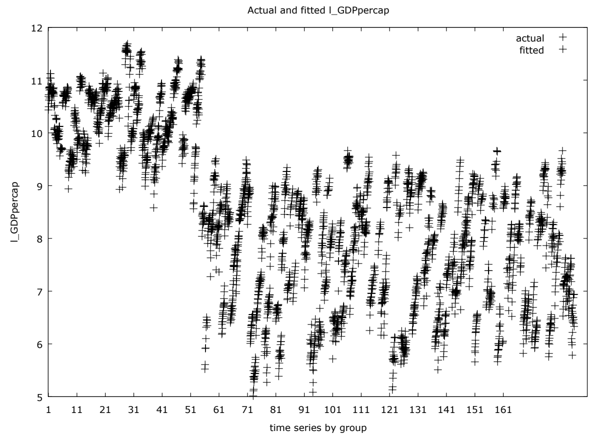
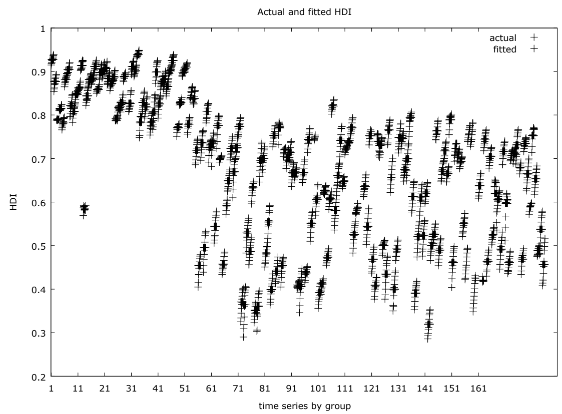
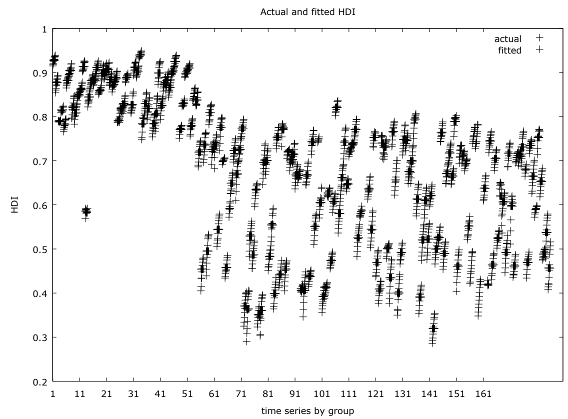
Appendix D X-Y Scatter Plots

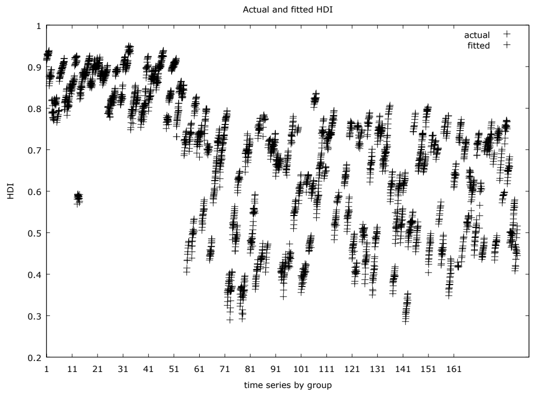
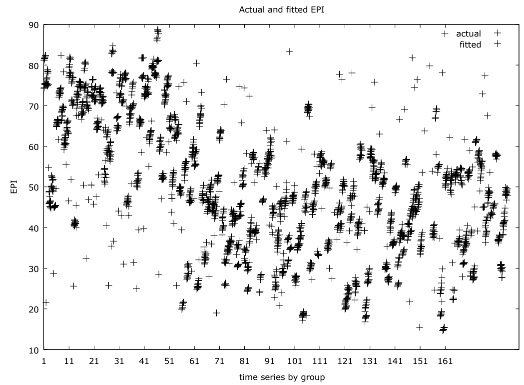
<table>
<tr><th></th><th>COR on the X-Axis</th><th>SE on the X-Axis</th></tr>
<tr><td>GDP on the Y-axis</td><td>
</td><td>
</td></tr>
<tr><td>HDI on the Y-axis</td><td>
</td><td>
</td></tr>
</table>

EPI on the *Y*-axis		

Source: Authors' processings.

Appendix E Graphs for the Actual (+) and Fitted (×) Values of the GDP, HDI and EPI Respectively, through the Optimal Estimation Technique, Using COR and SE As Exogenous Variables

<table>
<tr><th></th><th>COR as Independent Variable</th><th>SE as Independent Variable</th></tr>
<tr><th></th><th>Model (1) FEM</th><th>Model (2) FEM</th></tr>
<tr><td>The Estimation of GDP, the entire sample, from Table A2a</td><td>
</td><td>
</td></tr>
<tr><th></th><th>Model (1) FEM</th><th>Model (2) FEM</th></tr>
<tr><td>The Estimation of HDI, the entire sample, from Table A3a</td><td>
</td><td>
</td></tr>
</table>

	Model (1) FEM	**Model (2) FEM**
The Estimation of EPI, the entire sample, from Table A4a		
Source: Authors' processings.		

References

1. Mauro, P. Corruption and growth. *Q. J. Econ.* **1995**, *110*, 681–712. [CrossRef]
2. Djankov, S.; La Porta, R.; Lopez-de-Silanes, F.; Shleifer, A. The regulation of entry. *Q. J. Econ.* **2002**, *117*, 1–37. [CrossRef]
3. Dreher, A.; Schneider, F. *Corruption and the Shadow Economy: An Empirical Analysis*; CREMA Working Paper Series 2006-01; Center for Research in Economics, Management and the Arts (CREMA): Zürich, Switzerland, 2006.
4. Sahakyan, N.; Stiegert, K.W. Corruption and firm performance. *East. Eur. Econ.* **2012**, *50*, 5–27. [CrossRef]
5. Groşanu, A.; Boţa-Avram, C.; Răchişan, P.R.; Vesselinov, R.; Tiron-Tudor, A. The influence of country-level governance on business environment and entrepreneurship: A global perspective. *Amfiteatru Econ. J.* **2015**, *17*, 62–78.
6. Beck, P.; Mahler, M. A comparison of bribery and bidding in thin markets. *Econ. Lett.* **1986**, *20*, 1–5. [CrossRef]
7. Caselli, F.; Michaels, G. Do oil windfalls improve living standards? Evidence from Brazil. *Am. Econ. J. Appl. Econ.* **2013**, *5*, 208–238. [CrossRef]
8. Jiang, T.; Nie, H. The stained China miracle: Corruption, regulation, and firm performance. *Econ. Lett.* **2014**, *123*, 366–369. [CrossRef]
9. Rodrik, D.; Subramanian, A.; Trebbi, F. Institutions rule: The primacy of institutions over geography and integration in economic development. *J. Econ. Growth* **2004**, *9*, 131–165. [CrossRef]
10. Stojanovi´c, I.; Ateljevi´c, J.; Stevi´c, R.S. Good Governance as a Tool of Sustainable Development. *Eur. J. Sustain. Dev.* **2016**, *5*, 558–573. [CrossRef]
11. Zaman, G.; Goschin, Z. Shadow economy and economic growth in Romania. Cons and pros. *Procedia Econ. Financ.* **2015**, *22*, 80–87. [CrossRef]
12. World Bank. *Anticorruption*; World Bank: Washington, DC, USA, 2009.
13. Paldam, M. The big pattern of corruption: Economics, culture and the see saw dynamics. *Eur. J. Political Econ.* **2002**, *18*, 215–240. [CrossRef]
14. Achim, M.; Borlea, N.S. Determinants of the European funds absorption 2007–2013 in European Union Member States. In Proceedings of the WEI International Academic Conference in Vienna, Vienna, Austria, 12–15 April 2015; pp. 174–188.
15. Fjeldstad, O.H. *Tax Evasion and Corruption in Local Governments in Tanzania: Alternative Economic Approaches*; Working Paper 14; Chr. Michelsen Institute: Bergen, Norway, 1996; pp. 1–31.
16. Fjeldstad, O.H. Fighting fiscal corruption: Lessons from the Tanzania revenue authority. In *Public Administration and Development*; Wiley: Hoboken, NJ, USA, 2003; Volume 23, pp. 165–175.
17. Kaufman, D. *Can Corruption Adversely Affect Public Finance in Industrialized Countries*; Brookings Institution Opinions; Brookings Institution: Washington, DC, USA, 19 April 2010.
18. Ivanyna, M.; Moumouras, A.; Rangazas, P. The Culture of Corruption, Tax Evasion, and Optimal Tax Policy. 2010. Available online: http://www2.warwick.ac.uk/fac/soc/economics/events/seminars-workshopsconferences/conferences/mysore/programme/ivanyna.pdf (accessed on 15 March 2019).
19. Bordean, O.N. Business students' perceptions on corporate governance. *Int. J. Arts Commer.* **2012**, *1*, 173–184.
20. De Rosa, D.; Gooroochurn, N.; Gorg, H. *Corruption and Productivity: Firm-Level. Evidence from the BEEPS Survey*; Kiel Working Paper No. 1632; World Bank: Washington, DC, USA, 2010.
21. Achim, M.V. Corruption, income and business development. *J. Int. Bus. Entrep. Dev.* **2017**, *10*, 85–100. [CrossRef]
22. Absalyamova, S.; Absalyamov, T.; Khusnullova, A.; Mukhametgalieva, C. The impact of corruption on the sustainable development of human capital. *J. Phys. Conf. Ser.* **2016**, *738*, 1–6. [CrossRef]
23. Forson, J.A.; Buracom, P.; Chen, G.; Baah-Ennumh, T.Y. Genuine Wealth Per Capita as a Measure of Sustainability and the Negative Impact of Corruption on Sustainable Growth in Sub-Sahara Africa. *S. Afr. J. Econ.* **2017**, *85*, 178–195. [CrossRef]
24. Kirchler, E. *The Economic Psychology of Tax Behavior*; Cambridge University Press: Cambridge, UK, 2007.
25. Borlea, S.; Achim, M.V.; Miron, M. Corruption, Shadow Economy and Economic Growth: An Empirical Survey Across the European Union Countries. *Studia Univ. Vasile Goldis Arad Ser.* **2017**, *27*, 19–32. [CrossRef]
26. Hamra, W. Bribery in international business transactions and the OECD convention: Benefits and limitations. *Bus. Econ.* **2000**, *35*, 33–46.

27. Ruzek, W. The Informal Economy as a Catalyst for Sustainability. *Sustainability* **2015**, *7*, 23–34. [CrossRef]
28. Husted, B.W. Wealth, culture, and corruption. *J. Int. Bus. Stud.* **1999**, *30*, 339–359. [CrossRef]
29. Treisman, D. The causes of corruption: A cross-national study. *J. Public Econ.* **2000**, *76*, 399–457. [CrossRef]
30. Gundlach, E.; Paldam, M. The transition of corruption: From poverty to honesty. *Econ. Lett.* **2009**, *103*, 146–148. [CrossRef]
31. Transparency International. Corruption Perception Index. Available online: https://www.transparency.org/ (accessed on 20 February 2019).
32. Schneider, F.; Klinglmair, R. Shadow Economies Around the World: What Do We Know? IZA Discussion Paper No. 1043. CESifo Working Paper Series No. 1167. 2004. Available online: https://ssrn.com/abstract=518526 (accessed on 20 August 2019).
33. Orviska, M.; Hudson, J. Tax evasion, civic duty and the law abiding citizen. *Eur. J. Political Econ.* **2003**, *19*, 83–102. [CrossRef]
34. World Bank. Corruption, helping countries combat: The Role of the World Bank. In *Poverty Reductionand Economic Management*; World Bank: Washington, DC, USA, 1997; p. 1.
35. Medina, L.; Schneider, F. *Shadow Economies Around the World: What Did We Learn Over the Last 20 Years*; WP/18/17; International Monetary Fund Working Paper: Washington, DC, USA, 2018.
36. Schneider, F.; Buehn, A. Shadow Economy: Estimation Methods, Problems, Results and Open Questions. *Open Econ.* **2018**, *1*, 1–29. [CrossRef]
37. Schneider, F.; Buehn, A.; Montenegro, C.E. New Estimates for the Shadow Economies All over the World. *Int. Econ. J.* **2010**, *24*, 443–461. [CrossRef]
38. Deardorff, A.V. Deardorffs' Glossary of International Economics. 2016. Available online: http://www-personal.umich.edu/~{}alandear/glossary/e.html (accessed on 21 December 2019).
39. Torgler, B.; Schneider, F. The Impact of Tax Morale and Institutional Quality on the Shadow Economy. *J. Econ. Psychol.* **2009**, *30*, 228–245. [CrossRef]
40. Boța-Avram, C.; Groșanu, A.; Răchișan, P.R.; Gavriletea, M.D. The Bidirectional Causality between Country-Level Governance, Economic Growth and Sustainable Development: A Cross-Country Data Analysis. *Sustainability* **2018**, *10*, 502. [CrossRef]
41. World Bank. *World Development Indicators*; The World Bank: Washington, DC, USA, 2019; Available online: https://openknowledge.worldbank.org (accessed on 10 August 2019).
42. Stiglitz, J.E.; Sen, A.; Fitoussi, J.P. *Mismeasuring Our Lives: Why GDP Doesn't Add Up, Commission on the Measurement of Economic Performance and Social Progress*; New Press: New York, NY, USA, 2010.
43. Aidt, T.S. *Corruption and Sustainable Development*; No. CWPE 1061. Cambridge, UK, 2010. Available online: https://www.repository.cam.ac.uk/bitstream/handle/1810/242086/cwpe1061.pdf;jsessionid533A12327621029A0EF0B686DD27C5E5C?sequence51 (accessed on 12 September 2019).
44. World Commission on Environment and Development. *Our Common Future*; Oxford University Press: Oxford, UK, 1987; p. 27. ISBN 019282080X.
45. UNDP. Human Development Reports. Available online: http://hdr.undp.org (accessed on 10 September 2019).
46. Murshed, M.; Mredula, F.A. Impacts of Corruption on Sustainable Development: A Simultaneous Equations Model Estimation Approach. *J. Account. Financ. Econ.* **2018**, *8*, 109–133.
47. Yale University. Environmental Performance Index. Available online: https://epi.envirocenter.yale.edu (accessed on 15 October 2019).
48. Esty, D.; Levy, M.A.; Kim, C.H.; de Sherbinin, A.; Srebotnjak, T.; Mara, V. *Environmental Performance Index*; Yale Center for Environmental Law and Policy: New Haven, CT, USA, 2008.
49. Emerson, J.W.; Hsu, A.; Levy, M.A.; de Sherbinin, A.; Mara, V.; Esty, D.C.; Jaiteh, M. *Environmental Performance Index and Pilot Trend Environmental Performance Index*; Yale Center for Environmental Law and Policy: New Haven, CT, USA, 2012; Available online: http://epi.yale.edu (accessed on 10 May 2012).
50. Gallego-Alvarez, I.; Vicente-Galindo, M.; Galindo-Villardón, M.; Rodríguez-Rosa, M. Environmental Performance in Countries Worldwide: Determinant Factors and Multivariate Analysis. *Sustainability* **2014**, *6*, 7807–7832. [CrossRef]
51. World Bank Group. World Bank report 'Country and Lending Groups' Report. 2015. Available online: https://www.worldbank.org/ (accessed on 10 February 2019).
52. Williams, C.C. Towards a Commodified World? Re-Reading Economic Development in Western Economies. *Int. J. Econ. Dev.* **2004**, *6*, 1–21. [CrossRef]

53. Achim, M.V.; Borlea, N.S. *Economic and Financial Crime. Corruption, Shadow Economy and Money Laundering. Theoretical and Practical Approaches*; Economica Publishing House: Bucharest, Romania, 2019.
54. SolAbility Sustainable Intelligence. The Global Competitiveness Reports. Available online: http://solability.com/the-global-sustainable-competitiveness-index (accessed on 25 October 2019).
55. Khan, M.H. *Governance, Economic Growth and Development Since the 1960s*; UN DESA Working Paper No. 54; DESA: New York, NY, USA, 2007.