The attitude towards corruption in the EU under a gender perspective

Andrea Cámara-Payno,
Julieta Díez-Hernández,
Martyna Novak and
Elena Temiño-Santamaría*

University of Burgos,
Burgos, Castilla y Leon, Spain
Email: acp0053@alu.ubu.es
Email: jdhernandez@ubu.es
Email: martyna.nowak85@gmail.com
Email: mts0031@alu.ubu.es
*Corresponding author

Abstract: The study analyses the possible relationship between the level of corruption in a country, the gender inequality and the number of women in decision-making positions within government and large companies' boards of directors. The study was carried out for 35 European countries over the period 2010–2020. Results confirm that greater inequality increases the level of corruption, while a greater presence of women in decision-making positions, especially in European societies with a stronger rule of law, increases the transparency levels in the country and reduces corruption. This study does not provide sufficient evidence of gender disparities in terms of attitudes towards corruption. However, it is possible to verify that a greater presence of women in decision-making positions enhances the country's overall gender equality and, ultimately, reduces corruption.

Keywords: corruption; corrupt behaviour; gender perspective; panel data; gender equality; women in parliament; women on direction boards; gender inequality index; rule of law.

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Biographical notes: Andrea Cámara-Payno, MSc, is a business and law graduate that specialised in corruption and fraud prevention, through her thesis on EU funds efficiency. She has presented some articles in international conferences and worked as a project manager assistant for an EU project. She is currently studying a Master on Accounting and Auditing while developing a career in a consulting firm. Her research interests include gender, ethics, fraud prevention and finances.

Julieta Díez-Hernández is a PhD student, graduated in Business Management and specialised in Circular Economy. Her research focuses on Life Cycle Thinking, the social sphere of sustainability and on the development of a critical analysis of the Circular Economy framework. She has published some

articles in international journals and international conferences. Currently, her research interests include sustainability, circular economy, gender and business ethics.

Martyna Novak, PhD, is a detail-oriented professional with over 10 years of experience in Sino-European relations, ranging from manufacturing, project management and diplomacy to conducting a successful PhD project in Mandarin Chinese. Fluent in five languages, experienced and passionate about working with multinational teams, always aimed towards solving problems and committed to every undertaken project. She has published some articles in international journals and international conferences. She has interdisciplinary experience in various areas including business, development languages, translation, consulting and as a university lecturer.

Elena Temiño-Santamaría, MSc, is a business and law graduate that specialised in corruption and fraud prevention, through her thesis on neural networks and public procurement in the EU, developing a tool for fraud prevention through red flags identification. She is currently undertaking a Master on Accounting and Auditing while developing her professional career. Her research interests include gender, public procurement, ethics, fraud prevention.

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1 Introduction

Corruption is a huge obstacle for the European Union today, economically, politically and socially. This problem has been repeatedly referred to, by the European Commission (2017), as 'a drag on economic growth'. The real cost of corruption not only encompasses bribes and the diversion of funds, but also causes other hidden costs related to production losses, inefficiencies, unequal wealth distribution or negative environmental impacts.

Over the years, research has been focused on investigating the potential causes of this problem, aiming to understand them, in order to prevent or combat it from taking place. For Bautista (2016) it is essential to locate the corruption case in space and time, understand its genesis and put it in context. Being aware of the causes that lead a person into corrupt behaviour involves understanding their set of values and how their actions are affected by them. Moreover, the relationship between the development of morality, moral judgement, a person's ethical principles and corrupt behaviours has been widely studied and is, therefore, well-known (Andrés-Jovani, 2012).

In this context, Kohlberg's (1984) ideas on moral development have been used as a basis for the development of tools for improving the understanding of this phenomenon. According to the renowned psychologist, moral development allows the individual to discriminate which of the possible actions is the most ethical in situations where there are two or more conflicting stakes. However, this does not imply that they will ultimately act in accordance with the most ethical decision.

Given the existing literature on the topic, and the existing gaps identified, this research focuses on studying the influence of gender as a discerning factor influencing corrupt behaviours. Do men and women face corruption dilemmas in the same way? In relation to Kohlberg's ideas, gender divergences in the development of moral judgement have been studied under different paradigms. Studies as Friesdorf et al. (2015) suggested that gender affects the judgment of moral dilemmas, and even raise the possibility that women and men behave differently when immersed in economic activities (Heinz et al., 2012).

The truth is that the best-known and most mediatic corruption cases such are men. Corruption cases have been enacted by men. Some evidence can be found in cases as the Gürtel corruption case in Spain, where 75% of those convicted were men, or the scandal involving the former head of Poland's financial markets regulator, Marek Chzanowski. Other examples showing a higher involvement of men in corruption cases can be the Volkswagen case, in which, besides from the company itself, the main defendant was former CEO Martin Winterkorn, accused of fraud in the emissions scandal, or one of the biggest corruption cases in Europe, the well-known case of the Bank of Hungary, in which Gyorgy Matolcsy, governor of the Hungarian Central Bank, was accused of the siphoning off of more than a billion euros from the institution to companies owned by his inner circle.

The fact that almost all corruption cases involve men brings up the idea that women may be less corrupt by nature. However, the truth is that there are not many women in decision-making and powerful management positions, as the glass ceiling is still affecting their professional advancement. Segerman-Peck (1991) defined this glass ceiling as a set of apparently invisible discriminatory mechanisms that build a difficult barrier to overcome in women's professional careers.

Despite the fact that the most relevant positions in organisations should be filled on the basis of knowledge, effort and skills, the reality is that these positions remain out of reach for most women. Statistics are striking as, e.g., in Britain, 80% of the most powerful positions are held by men and only 20% by women (Tutchell and Edmonds, 2015).

Based on the existence of this glass ceiling, proponents of *the gender convergence theory* claim that when these divergencies are attenuated and, therefore, the proportion of women in decision-making positions increases, the level of corruption is going to be balanced between both genders. This paradigm forecasts a convergence in terms of corrupt behaviour as societies become more egalitarian and as women gain access to positions of power (Alhassan-Alolo, 2007). However, this point of view does not match with the indices of gender equality and corruption in European countries. In fact, countries with higher levels of equality, with a greater presence of women in parliaments, governments and direction boards register lower levels of corruption.

These examples illustrate the feasibility of a possible influence of gender on corruption and, therefore, exploring that possibility is the motivation of this study. Are men more prone to fraudulent attitudes that women? Would one expect a reduction in corruption levels with an increase in the number of women in decision-making positions? These are some of the questions raised in the research, and which, subsequently, open the door to new queries: Is it an issue just related to gender or is it really the accumulation of cultural, social, educational or equality factors that lead to these differences? Despite having debated for more than 15 years on this topic, there is still no consensus on the possible connection between gender and corruption, and the aim of this study is to shed light on this matter.

The study's empirical research covers the methodology conducted for a sample of 35 European countries for the 2010–2020 research period. Besides the sample employed, the variables used include the Corruption Perceptions Index to check whether its relationship with the Gender Inequality Index and the Rule of Law Index indicates that the most equal European countries are the least corrupt ones. Variables relating to women's participation in government and corporate life are also measured in order to check the extent to which greater equality reduces corruption, specifically in those countries where greater numbers of women are in decision-making positions. By using panel data analysis, results are obtained.

The aim of this research paper is to highlight the positive implications that higher levels of women´s participation in decision-making administration and corporate positions can have in achieving better governance and lower rates of corruption. Nevertheless, it should not be inferred from the study that increasing the proportion of women in positions of power will automatically reduce corruption, as the dependency of the issue on other socio-cultural and political variables must also be considered.

The study shows that countries with higher levels of rule of law, judicial independence, equality and consequently a higher percentage of women in positions of power, generally attain lower levels of fraud and corruption.

The rest of the paper is structured as follows. In Section 2 theoretical arguments are discussed and hypotheses to be tested are developed. In Section 3 the empirical design is set out and both data and empirical methodology are introduced. Section 4 presents the results and robustness analyses. Finally, Section 5 concludes by summarising the most important implications and suggesting some indications for future lines of research.

2 Corruption under a gender perspective

Previous studies on gender and corruption draw some conclusions and a number of theories and implications. Throughout the 20th century, researchers have attempted to shed some light on the possible causal relationship between gender and corruption. Dollar and Gatti (1999) indicated that an increase in the number of women in parliament could be associated with a decrease in the level of corruption. They based their findings on the traditional ethical values associated with women, such as honesty and generosity. In this sense, Rivas (2008) confirmed that women tend to be more concerned about the common good and have higher levels of ethical behaviour.

Backing this theory, Dollar et al. (2001) and Swamy et al. (2001) concluded that a greater participation of women in political, economic and work life is associated with less corruption. Therefore, they defend *the gender differences perspective*. Dollar et al. (2001) suggested that a greater level of representation of women in the parliament lowered the level of corruption, variables influencing corruption as gender and civil liberties, population, schooling, openness of the trade, ethnicity or colonial history were considered. Swamy et al. (2001) included indicators for measuring gender and GNP per capita, education, religion, political freedom, colonial history or women in labour force and government participation, among others. This also takes into consideration the corruption and governance indicators developed by Kaufmann et al. (1999). Nevertheless, this theory is also criticised by authors such as Sung (2003) who argues that the association between gender and corruption is false. Sung (2003) considered this causal relationship to be spurious and proposes what he calls the *fairer system thesis*,

claiming that the relationship between gender and corruption is not truly significant and causal if variables such as the rule of law, political rights, freedom of the press are taken into consideration.

A third line, on which this study is focused, concludes that there are fewer opportunities for women to participate in corrupt behaviour, since they also have fewer possibilities to access to the spheres where corruption and fraud occur given that the professional positions they generally hold are lower than those of men (Alhassan-Alolo, 2007; Mocan, 2008; Jha and Sarangi, 2018). It is the thesis of the *corruption convergence in gender* paradigm considering that what makes women less prone to corruption is not their gender, but their structural exclusion from power. Proponents of this theory claim that women are not less corrupt, but there are gender differences in the opportunities for corrupt behaviour; hence, the propensity of men to engage in opportunistic and fraudulent behaviour. Consequently, this theory argues that, in the moment when women reach the same social and professional status as men, their chances of carrying out corrupt behaviours will increase. This theory is also supported by the research of Cameron et al. (2009), who note that levels of exposure to corruption in everyday life promote a certain degree of tolerance and acceptance towards these fraudulent attitudes.

On the basis of these theories, the present study raises a number of questions: Are women really less corrupt than men? Does an increase in equality generate an increase in corruption? Is there an association between gender and corruption, or are the differences based on social status? The three theories introduced can be subject of debate, as arguments for and against the relevance of gender on corruption attitudes can be draw on. However, while the position may be conflicting, they all agree on the fact that achieving greater equality reduces a country's corruption level.

In order to blueprint the real relationship between gender and corruption and to clear all the uncertainties presented in the questions, two hypotheses have been built.

Compliance with the rule of law is crucial in assessing a country's level of development in different areas. Specifically, the Rule of Law Index, proposed by World Justice Project, evaluates the degree of its application in different countries according to more than 40 indicators, including the limit to governmental power, the absence of corruption, open government, respect for fundamental rights or justice. This index includes indicator for corruption and also for gender equality and, therefore, has been widely used in research. Different authors have studied in a number of ways how the implementation of the rule of law in a country influences its level of corruption (De la Croix and Delavallade, 2011; Elbasani and Šabić, 2018; North et al., 2013; Rose-Ackerman, 2007).

In particular, Kaufmann et al. (2005) illustrated with their study that countries with a lower control over corruption are usually characterised by lower levels of GDP per capita. In fact, states with greater difficulties in controlling corruption are generally associated with greater economic and political instability, low public investment and higher inequality (Bigio and Ramirez-Rondán, 2006).

It seems coherent, therefore, to go beyond the male-female binomial and include new factors that, taken together, affect the level of corruption in a country. With this aim, the study includes other factors should be considered when studying the relationship between gender and corruption, as judicial independence, level of education, culture, free journalism, equality or competitive elections, all of them inherently encompassed under the rule of law.

Therefore, the relation between rule of law and corruption has been well-researched and analysed. The key factor of the study is the level of gender inequality of each country, which is a more specific and focused issue than the generalised rule of law analysis. This research aims at filling the gap existing in literature concerning the relationship between equality and corruption. To do so, a first hypothesis has been set relating greater equality to lower levels of corruption. Moreover, linking this relationship to how the development of the rule of law within a country influences the levels of gender inequality, can be substantially beneficial for the study in order to gain robustness.

H1: Greater equality between men and women is related to lower levels of corruption.

On the basis of the aforementioned paradigms linking corruption and gender inequality, the first hypothesis can prove to have some shortcomings given the potential spurious relationship between gender and corruption (Esarey and Chirillo, 2013). Therefore, some control variables should be taken into consideration to assure the results robustness.

However, it is also necessary to understand equality not only from the social justice point of view, but also from a power perspective. In other words, the relationship between corruption rate and the presence of women in government positions as well as in corporate decision-making roles should also be studied separately. The use of the rule of law proves to be significant, given its role on proving whether the relationship between the variables (corruption and equality) responds just to correlation or if there is an underlying causation relationship. To this end, European countries scoring high in gender equality in decision-making positions are discriminated, to analyse the corruption attitude when a high level of equality in power position is achieved.

For this reason, a second hypothesis is presented including indicators of women presence in decision-making positions in, both, government and corporations. In order to decrease the possibility of spuriousness countries will be differentiated between those with a higher representation of women in parliament, government and companies' direction boards and those with a lower one.

H2: Greater equality between men and women in decision making positions is related to lower levels of corruption.

3 Research methodology

3.1 Sample and method

The sample is made up of data from 35 European countries and the European Union average in the period 2010–2020. The sources of this data are cited hereafter. The non-governmental organisation Transparency International, the World Bank, the United Nations Development Programme, and the European Institute for Gender Equality.

The database developed with the figures obtained from the sources cited, contains time series organised by country, which allows for the development of an explanatory analysis through the panel data method. This technique makes it possible to capture the heterogeneity between countries as well as the evolution of the figures in the same country over time.

3.2 Model and variables

A regression analysis is developed to test the first hypothesis following the general model shown in the equation (1):

$$CPI_{it} = \beta_0 + \beta_1 \cdot \text{Log}GDPpc_{it} + \beta_2 \cdot GII_{it} + \text{Year} + \varepsilon_{it} \quad (1)$$

where CPI is the Corruption Perception Index, developed by the non-governmental organisation Transparency International. This indicator gives a score from 0 to 100 to each country, and is based on the perceptions of corruption in each country captured by different sources. A higher score corresponds to a lower perception of corruption.

As a robustness check, the (CPI) variable has been replaced as a dependent variable by the Control of Corruption Index (CCI), developed by the World Bank. This index captures the extent of the corrupt behaviours in a country and the effectiveness of the country's policy and institutional framework to prevent and combat fraud. This estimate gives a value, in units of a standard normal distribution, between –2.5 and 2.5 to each country. Countries with the highest corruption, score lower on this index. The model introduced uses the negative of the CCI in all specifications, so that a higher number indicates more severe corruption. The variable (CCI) has been constructed so that its mean is 0 and its standard deviation equals 1 (Chen et al., 2020).

The independent variable used is the Gender Inequality Index (GII), provided by the United Nations Development Programme, as an indicator of the inequality that exists in a country measured through three important aspects of human development such as reproductive health, empowerment and economic status. A higher value in this index indicates a greater degree of disparity between females and males, so a negative relationship between the Gender Inequality Index and the dependents variables is expected.

As a substitute variable for GII, the model proposes the use of the variable Rule of Law (RoL) which it is an index measured by eight indicators and 40sub-indicators from two sources of data collected by the World Justice Project. This variable takes value from 0 to 1 and the indicators it considers are included the constraint on governmental powers, the absence of corruption, the openness of the government, the respect to fundamental rights, the respect to order and security, the regulatory enforcement, the civil justice and the criminal justice.

As a control variable, it is used the GDP per capita (GDP_pc), specifically the logarithm of the variable (LogGDP_pc_{it}), gross domestic product divided by midyear population, of each country in the sample. Aggregates are based in current US dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. Deductions for depreciations of fabricated assets or for depletion, and degradation of natural resources are not taken into consideration in the calculation. In the Appendix A, a table of the definition of variables has been included.

And other regression analysis is developed to test the second hypothesis following the general model shown in equations (2) and (3):

$$\begin{aligned} CPI_{it} &= \beta_0 + \beta_1 \cdot \text{LogGDP}pcit + \beta_2 \cdot WoGov_{it} \\ &\quad + \beta_3 \cdot \left(WoGov_{it} * DumGII\right) + Year + \varepsilon_{it} \end{aligned} \quad (2)$$

where the variable Control Perception Index (CPI) is presented, as in the previous model (1), as the dependent variable. And, as an independent variable, the percentage of women in government, local or national, is included for each European country ($WoGov_{it}$). This information has been extracted from the database of the European Institute for Gender Equality. This EU agency publishes in its Gender Statistics Database the statistics about the presence of women and men in decision-making in different labour sectors such as politic, public administration, judiciary, business, education or sports. The independent variable ($WoGov_{it}$) is directly related to the countries' political and administrative sphere. It will be replaced, to test the model's robustness, by other independent variables, the percentage of Women in the parliament (WoPar) and the percentage of women into the top executive position in a public administration (WoAdm).

On the other hand, a dummy variable (DumGII) has been included, which allows us to group the countries and include the effect provided by the inequality index. This (DumGII) variable takes the value '1' for countries with a GII higher than the average, and '0' otherwise. Once again, for testing the model's robustness, the dummy variable (DumGII) has been replaced by another dummy variable (DumRoL) which takes the value '1' for those countries that score over the average on the Rule of Law Index, and '0' otherwise.

In order to analyse the situation in corporations, the independent variable used is the percentage of women in the board of directors (WoBoard), and the substitution variable considered for the robustness test is the percentage of women that becomes CEO and/or Chairperson ($WoCEO_{it}$). These variables have also been extracted from the Gender Statistics Database developed by the European Institute for Gender Equality. For the private companies sphere, a model (2.2) has been developed in which the dummy variable (DumGII) is used again and, it is also replaced by (DumRoL) in order to gain test the robustness.

$$\begin{aligned} CPI_{it} &= \beta_0 + \beta_1 \cdot LogGDPpcit + \beta_2 \cdot WoBoard_{it} \\ &+ \beta_3 \cdot \left(WoBoard_{it} * DumGII\right) + Year + \varepsilon_{it} \end{aligned} \tag{3}$$

4 Results and discussion

4.1 Descriptive analysis

In order to provide a first look into the situation of women in decision-making positions throughout Europe, data from a single year of the period considered has been disclosed as can be seen in Table 1.

In Table 1, the main descriptive statistics to indicate the percentage of women on boards, parliaments, and the level of Gender Inequality Index by European country in 2019 are shown.

The countries coloured in a lighter shades on the map (see Figure 1) represent those countries where inequality (GII) is lower, with some countries such as France or the northern countries, Finland, Norway and Sweden being close to achieving complete equality. In contrast, the darker shades reflect higher inequality.

Table 1 Distribution of women by EU countries in relevant positions for the year 2019

Country	*Gender inequality index (GII)*	*Women on boards (WoBoard)*	*Women in parliaments (WoPar)*
Denmark	3.80%	30.00%	39.70%
Sweden	3.90%	37.50%	47.60%
Belgium	4.30%	35.90%	42.40%
Netherlands	4.30%	34.20%	35.10%
Norway	4.50%	40.20%	40.80%
Finland	4.70%	34.20%	46.50%
France	4.90%	45.30%	37.10%
Iceland	5.80%	45.90%	38.10%
Slovenia	6.30%	24.60%	22.10%
Luxembourg	6.50%	13.10%	28.30%
Austria	6.90%	31.30%	38.90%
Italy	6.90%	36.10%	35.80%
Spain	7.00%	26.40%	41.90%
Portugal	7.50%	24.60%	40.40%
Germany	8.40%	35.60%	31.70%
Cyprus	8.60%	9.40%	17.90%
Estonia	8.60%	9.40%	28.70%
Ireland	9.30%	26.00%	24.30%
European Union	10.70%	28.80%	31.70%
Montenegro	10.90%	21.10%	29.60%
Poland	11.50%	23.50%	27.90%
Croatia	11.60%	27.00%	19.90%
Greece	11.60%	10.30%	21.70%
UK	11.80%	32.60%	29.50%
Lithuania	12.40%	12.00%	24.10%
Serbia	13.20%	15.60%	37.60%
Czech Republic	13.60%	18.20%	20.30%
North Macedonia	14.30%	16.70%	40.00%
Bosnia and Herzegovina	14.90%	17.00%	21.10%
Malta	17.50%	10.00%	14.90%
Latvia	17.60%	31.70%	30.00%
Albania	18.10%	n.a.	30.30%
Slovakia	19.10%	29.10%	20.70%
Bulgaria	20.60%	18.50%	27.10%
Hungary	23.30%	12.90%	12.20%
Romania	27.60%	12.60%	19.80%
Turkey	30.60%	18.10%	17.30%
Liechtenstein	n.a.	0.00%	12.00%

This means that South Eastern European countries such as Romania, Bulgaria or Turkey have much higher levels of inequality, in some cases reaching score higher than 30%.

Figure 1 Gender inequality index (GII) throughout Europe

Furthermore, in terms of gender equality, when considering decision-making positions, Table 1 shows that those countries where the Gender Inequality Index scores worse are also those where the proportion of women in positions of power as members of the parliament or companies' board members is less significant. A map of European countries and the presence of women in parliament and on direction boards is included in Appendix B.

After the 2019 preview, data from the whole period 2010–2020 has been gathered and analysed. In Table 2, the means' differences for all variables are disclosed. The countries are divided into those whose Gender Inequality Index (GII) is above the average (avg), and where inequality levels are therefore higher, and those countries whose GII is below the average. In addition, the total mean value, the standard deviation and the minimum, maximum and quartiles values of the variables are shown.

Results show that, in the European countries scoring high gender equality, countries with lower GII values, the weight of women in positions of power is generally higher. Thus, the percentage of women in government is higher, 32.3%, compared to 19.7% on average in countries with a higher GII, and therefore higher inequality. These results are similar to the ones showing women representation in parliament, where the presence of women in countries with a lower GII is greater, 31.9%, compare to the presence in countries with a much higher GII, 22.6%. Similarly, However, this is not the case in public administrations, where the presence of women is slightly higher in countries with higher levels of inequality, specifically, 2.4% higher.

Table 2 Descriptive statistics

Variable	*Mean*		*Total*	*p value*	*Std. Dev*	*Min*	*25%*	*75%*	*Max*
	GII >Avg								
CPI	0.518	0.709	0.616	0.00	0.169	0.32	0.46	0.77	0.94
CCI	0.379	1.369	0.884	0.00	0.875	–0.61	0.103	1.69	2.41
LOGGDP_pc	4.142	4.648	4.4	0.00	0.491	4	4	5	5
WoPar	0.226	0.319	0.275	0.00	0.991	0.087	0.202	0.365	0.496
WoGov	0.197	0.323	0.263	0.00	0.144	0	0.167	0.375	0.611
WoAdm	0.383	0.359	0.374	0.00	0.122	0.012	0.299	0.463	0.591
WoCEO	0.098	0.067	0.081	0.00	0.062	0	0.034	0.105	0.3
WoBoard	0.168	0.227	0.199	0.00	0.104	0	0.118	0.267	0.481
ROL	0.625	0.759	0.699	0.00	0.129	0.42	0.6	0.813	0.9

Notes: Mean, median, standard deviation, minimum, maximum and quartiles of the variables. CPI is the corruption perception index by each European country, calculated by the Transparency Organisation. CCI is the Control of Corruption Index by each European country of the sample calculated by the World Bank. GDP_pc measures the GDP per capita in each EU country. WoPar is the percentage of women into the parliament of EU country. WoGov is the percentage of women into the government of EU country. WoAdm is the percentage of women as an executive into the public Administration of EU country. WoCEO is the percentage of women that are CEO or Chairman of a company for each of EU country. WoBoard is the percentage of women that are members of the board of companies for each of EU country. GII measures the level of Gender Inequality Index calculated by Human Development Report. RoL measures the level of Rule of Law of each EU country by the factors calculated by World Justice Project.

As an example, the graph in Figure 2 shows the evolution between 2010 and 2020 of the percentage of women in political life in the European Union (EU28), in a country with good equality and Rule of Law scores as is France, and in another with lower scores, Romania (see Figure 2).

It can be seen in Figure 2, and also in the next Figure 3, that France, one of the countries achieving higher equality according to the Gender Inequality Index, has approximately 50% of the positions of power in both, government and on the board of companies, held by women.

However, in Romania, a country scoring higher in the GII, the percentage of women in government is lower and, although it increased positively, during the period 2010–2016, there has been an important decrease in the last two years. When considering the variable, women on direction boards, in Romania the presence of women is below 15% for the whole period.

The European Union is in an intermediate position, with a percentage of women onboards of 25% in 2020. Although it is true that the figures are growing gradually, the trend is upward, so it is considered that as holistically, countries are increasingly aware of gender equality.

Figure 2 Evolution of the number of women in government in the period 2010–2020

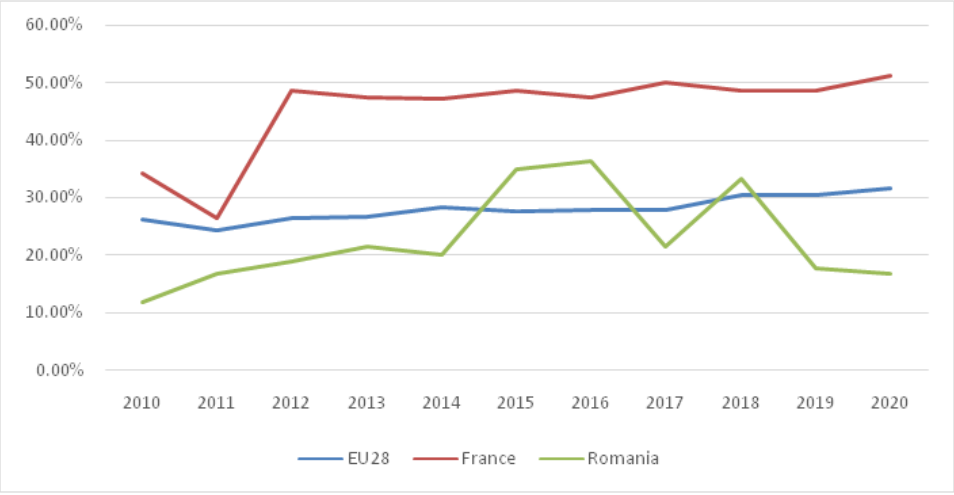
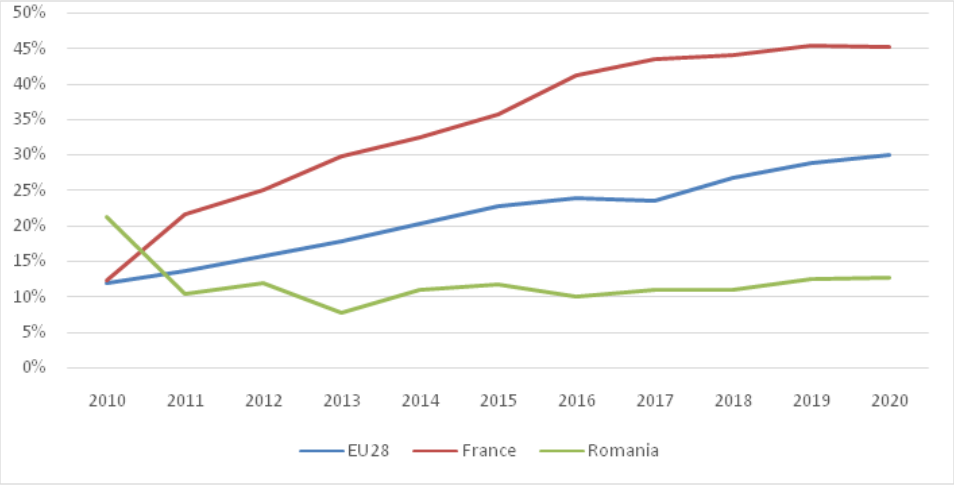


Figure 3 Evolution of the number of women on boards in the period 2010–2020



The analysis has also been conducted by grouping the countries among those whose Rule of Law Index is higher and lower than the average (see Appendix C), and it is observed that the descriptive results obtained are similar.

4.2 Explanatory analysis

Model (1) is estimated through the panel data method with fixed effects.[1] Results of Table 3 includes the influence of the variable (GII) on the Corruption Perception Index (CPI) in the first column and on the Control of Corruption Index (CCI) in the third one. The second and the fourth columns addresses the influence of the variable Rule of Law (RoL) on both corruption indices, in order to test robustness.

Table 3 Results of model (1) regression

	(1)	*(2)*	*(3)*	*(4)*
Variables	*(CPI)*	*(CPI)*	*(CCI)*	*(CCI)*
$LogGDPpc_t$	0.016	0.041***	0.118*	0.146**
	(0.017)	(0.015)	(0.061)	(0.062)
GII_t	–0.0348***		0.848**	
	(0.095)		(0.327)	
RoL_t		0.633**		1.77***
		(0.0.87)		(0.0.87)
Constant	0.592***	–0.006	0.266	–1.020***
	(0.078)	(0.088)	(0.268)	(0.362)
Observations	345	182	345	182
N	35	26	35	26
R^2-squared	0.585	0.934	0.0084	0.931
F-test	96.75***	37.77***	152.14***	70.63***
VIF	1.58	2.43	1.70	2.21

Notes: Estimated coefficients (standard errors) of the estimation of equation (1). The dependent variable is CPI, which is the corruption perception index by each European country, calculated by the Transparency Organisation. LogGDP_pc measures the logarithm of GDP per capita in each EU country. GII measures the level of Gender Inequality Index calculated by Human Development Report. RoL measures the level of Rule of Law of each EU country by the factors calculated by World Justice Project. R^2-squared and *F*-test are test to validate the regression. VIF is the variance inflation factor. ***, ** and * indicate significance at the 99, 95% and 90% confidence level, respectively.

As can be observed, the coefficient for the Gender Inequality Index (GII) is negative and significant so a higher inequality level causes an increase in the level of corruption of European country in the period 2010–2020. These results verify the first hypothesis, achieving greater gender equality influences positively on the reduction of corrupt behaviours.

When the variable Rule of Law (RoL) is considered, the results are similar. The coefficient is positive and significant. Therefore, the results obtained can be confirmed and the first hypothesis, verified.

As a robustness check, the variable Control of Corruption Index (CCI) is used substituting Corruption Perception Index (CPI). Using this variable, a positive relation implies that a lower level of corruption is beneficial.

As the Rule of Law variable is highly correlated with the coefficient of the Gender Inequality Index (GII), substituting one by the other proves useful for testing for sensitivity analysis of the results in columns (1) and (3). Hereafter, the correlation matrix among the variables of Table 4 is presented.

Table 4 Correlation matrix among Table 3 variables

	CPI	*CCI*	*LogGDP_pc*	*GII*	*Rol*
CPI	1				
CCI	0.993	1.000			
LogGDP_pc	0.818	0.832	1.000		
GII	–0.743	–0.721	–0.707	1.000	
RoL	0.967	0.956	0.900	–0.763	1.000

Notes: Correlations among the variables of the model 1.CPI is the Corruption Perception index by each European country, calculated by the Transparency Organisation. CCI is the Control of Corruption Index by each European country of the sample calculated by the World Bank. LogGDP_pc measures the logarithm of GDP per capita in each EU country. GII measures the level of Gender Inequality Index calculated by Human Development Report. RoL measures the level of Rule of Law of each EU country by the factors calculated by World Justice Project.

As can be seen in Table 4 the variables are highly correlated. Therefore, an in-depth analysis must be conducted separating the variables and considering the corporate and political spheres. In this way, multicollinearity problems can be avoided.

Results of Table 5 test the adequacy of the model (2.1), which indicates the relationship between the level of corruption and the percentage of women in the public sector (government, parliament and public administration positions) according to the level of gender inequality of each European country.

In column (2), the coefficient of the (WoGov) is positive and significant, although the interaction variable (WoGov*DumGII) is negative and statistically significant. When the dummy variable of the Gender Inequality Index equals zero, which is the case of the countries scoring low on gender inequality the case equality, an increase in the number of women in the government influences the reduction of the country's corruption level. Yet, when the dummy variable of the Gender Inequality Index (DumGII) equals one, the influence of a higher presence of women in the government in the level of corruption derives from the sum of the (WoGov) coefficients ($\beta_1 = 0.074$) and their interaction ($\beta_2 = 0.025$). The joint effect is still positive and statistically significant ($t_1 = 10.54$). In line with the second hypothesis, these results show that, in a context of greater equality, increasing the number of women in governmental positions reduces the level of corruption in a country.

Similarly, in column (3), the coefficient of the (WoPar) variable is positive and significant, although the interaction variable (WoPar*DumGII) is negative and statistically significant. When the dummy variable of the Gender Inequality Index (DumGII)equals zero, an increase in the number of women in the parliament influences the reduction of the country's corruption level. Yet, when the dummy variable (DumGII) equals one, the influence a higher presence of women in the parliament in the level of corruption is obtained from the sum of the (WoPar) coefficients ($\beta_1 = 0.172$) and their interaction ($\beta_1 = –0.038$). The joint effect is still positive and statistically significant ($t_2 = 18.52$). Once again, line with the defended thesis, these results show that, in a context of greater equality, increasing the number of women in the parliament reduces the level of corruption in a country.

Table 5 Model (2.1) regression's results using gender inequality index (GII) as an independent variable

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
$LogGDP\_pc_t$	0.003	0.004	0.008	0.009	0.003	
	(0.014)	(0.014)	(0.014)	(0.014)	(0.015)	
$WoGov_t$	0.059***	0.074***				
	(0.022)	(0.024)				
$WoGov_t$*$DumGII_t$		–0.025*				
		(0.016)				
$WoPar_t$			0.151***	0.172***		
			(0.049)	(0.050)		
$WoPar_t$*$DumGII_t$				–0.038***		
				(0.017)		
$WoAdm_t$					0.0157	0.040
					(0.036)	(0.036)
$WoAdm_i$*$DumGII_t$						0.0195
						(0.036)
Constant	0.592***	0.588***	0.543***	0.538***	0.601***	4.406***
	(0.063)	(0.063)	(0.066)	(0.066)	(0.065)	(0.065)
t_1		10.54				
t_2				18.52		
t_3						18.09
Observations	383	383	383	383	383	383
N	36	36	36	36	36	36
R^2-squared	0.461	0.524	0.474	0.535	0.251	0.241
F-test	87.36***	81.68***	87.68***	80.62***	87.68***	124.02***
VIF	1.56	1.49	1.56	1.41	1.14	1.14

Notes: Estimated coefficients (standard errors) of the estimation of equation (1). The dependent variable is CPI, which is the corruption perception index by each European country, calculated by the Transparency Organisation. LogGDP_pc measures the logarithm of GDP per capita in each EU country. GII measures the level of Gender Inequality Index calculated by Human Development Report. WoPar is the percentage of women into the parliament of EU country. WoGov is the percentage of women into the government of EU country. WoAdm is the percentage of women as an executive into the public Administration of EU country. DumGII takes value 1 if the value is higher than the mean of the variable Gender Inequality Index (GII) and 0 otherwise. R^2-squared and *F*-test are test to validate the regression VIF is variance inflation factor, t_i is the *t* statistic for the linear constraint test under the following null hypothesis: $H_0 : \bar{i} + \bar{j} = 0$ where $\bar{i}$ and $\bar{j}$ are the coefficients of the variable WoGov and the variable WoGov*DumGII, in columns 1 and 2, the coefficients of the variable WoPar and WoPar*DumGII in columns 3 and 4, and the coefficients of the variable WoAdm and WoAdm*DumGII in columns 5 and 6, respectively. ***, ** and * indicate significance at the 99%, 95% and 90% confidence level, respectively.

Table 6 Model (2.1) regression's results using rule of law index (RoL) as an independent variable

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
$LogGDP\_pc_t$	0.003	0.007	0.008	0.010	0.003	0.007
	(0.014)	(0.014)	(0.014)	(0.014)	(0.015)	(0.014)
$WoGov_t$	0.059***	0.092***				
	(0.022)	(0.026)				
$WoGov_t$*$DumRol_t$		–0.055***				
		(0.023)				
$WoPar_t$			0.151***	0.163***		
			(0.049)	(0.050)		
$WoPar_t$*$DumRol_t$				–0.051***		
				(0.022)		
$WoAdm_t$					0.0157	0.026
					(0.036)	(0.035)
$WoAdm_t$*$DumRol_t$						–0.065
						(0.013)
Constant	0.592***	0.580***	0.543***	0.545***	0.601***	0.600***
	(0.063)	(0.063)	(0.066)	(0.066)	(0.065)	(0.063)
t_4		10.54				
t_5				18.52		
t_6						18.09
Observations	383	383	383	383	383	383
N	36	36	36	36	36	36
R^2-squared	0.461	0.524	0.474	0.284	0.251	0.0.13
F-test	87.36***	81.68***	87.68***	70.48***	87.68***	88.40***
VIF	1.56	1.49	1.56	1.41	1.14	1.14

Notes: Estimated coefficients (standard errors) of the estimation of equation (1). The dependent variable is CPI, which is the corruption perception index by each European country, calculated by the Transparency Organisation. LogGDP_pc measures the logarithm of GDP per capita in each EU country. WoPar is the percentage of women into the parliament of EU country. WoGov is the percentage of women into the government of EU country. WoAdm is the percentage of women as an executive into the public Administration of EU country. DumRoL takes value 1 if the value is higher that the mean of the variable Rule of Law (RoL) and 0 otherwise. R^2-squared and *F*-test are test to validate the regression VIF is variance inflation factor, t_i is the *t* statistic for the linear constraint test under the following null hypothesis: $H_0 : \breve{i} + \breve{j} = 0$ where $\breve{i}$ and $\breve{j}$ are the coefficients of the variable WoGov and the variable WoGov*DumRoL, in columns 1 and 2, the coefficients of the variable WoPar and WoPar*DumRoL in columns 3 and 4, and the coefficients of the variable WoAdm and WoAdm*DumRoL in columns 5 and 6, respectively. ***, ** and * indicate significance at the 99%, 95% and 90% confidence level, respectively.

Table 7 Model (2.2) regression's results using gender inequality index (GII) as an independent variable

Variables	*(1)*	*(2)*	*(3)*	*(4)*
$LogGDP\_pc_t$	0.004	0.005	0.018	0.018*
	(0.014)	(0.001)	(0.011)	(0.011)
$Woboard_t$	0.010	0.027		
	(0.029)	(0.031)		
$Woboard_t*DumGII_t$		–0.033		
		(0.021)		
$WoCEO_t$			–0.041	–0.015
			(0.037)	(0.042)
$WoCEO_t*DumGII_t$				–0.046
				(0.035)
Constant	0.601***	0.597***	0.546***	0.548***
	(0.065)	(0.063)	(0.051)	(0.051)
*t*7		16.38		
*t*8				10.54
Observations	385	385	247	247
N	36	36	36	36
R-squared	0.589	0.550	0.685	0.704
F-test	92.64***	85.67***	134.13***	125.51***
VIF	1.35	1.5	1.07	1.63

Notes: Estimated coefficients (standard errors) of the estimation of equation (1). The dependent variable is CPI, which is the corruption perception index by each European country, calculated by the Transparency Organisation. LogGDP_pc measures the logarithm of GDP per capita in each EU country. GII measures the level of Gender Inequality Index calculated by Human Development Report. WoBoard is the percentage of women that are members of the board of companies for each of EU country. WoCEO is the percentage of women that are CEO or Chairman of a company for each of EU country. DumGII takes value 1 if the value is higher that the mean of the variable Gender Inequality Index (GII) and 0 otherwise. R^2-squared and *F*-test are test to validate the regression VIF is variance inflation factor, *ti* is the *t* statistic for the linear constraint test under the following null hypothesis: $H_0 : \breve{i} + \breve{j} = 0$ where $\breve{i}$ and $\breve{j}$ are the coefficients of the variable Woboard and the variable Woboard*DumRoL, in columns 1 and 2, the coefficients of the variable WoCEO and WoCEO*DumGII in columns 3 and 4, respectively. ***, ** and * indicate significance at the 99%, 95% and 90% confidence level, respectively.

Nevertheless, the coefficient of the variable (WoAdm) and its interaction with the dummy variable (WoAdm*DumGII) are not statistically significant. Therefore, there is not a significant influence on the corruption level of a country and the percentage of women occupying public sector administrative positions.

The results of Table 5 partially confirm the second hypothesis, implying that increasing the presence of women in decision-making positions in the public sector

reduces the level of corruption. According to the results, this relationship can be proved even in countries scoring high on gender equality, therefore, the *corruption convergence in gender* paradigm, which claims that once equality is achieved, corruption attitudes will be balanced out among genders, cannot be supported.

Table 6 includes the same model, changing the independent variable from GII to RoL. Therefore, its dummy variable (DumRoL) will equal zero for the European countries that score over the average on Rule of Law, and it will equal one, otherwise. This variable substitute (DumGII). The results obtained are similar to the ones obtained in Table 5, partially verifying the second hypothesis.

Table 8 Model (2.1) regression's results using rule of law index (RoL) as an independent variable

Variables	*(1)*	*(2)*	*(3)*	*(4)*
$LogGDP\_pc_t$	0.004	0.015	0.018	0.016*
	(0.014)	(0.011)	(0.011)	(0.011)
$Woboard_t$	0.010	0.088		
	(0.029)	(0.071)		
$Woboard_t$*$DumRoL_t$		–0.075		
		(0.064)		
$WoCEO_t$			–0.041	–0.099*
			(0.037)	(0.055)
$WoCEO_t$*$DumRoL_t$				0.102*
				(0.066)
Constant	0.601***	0.554***	0.546***	0.55***
	(0.065)	(0.052)	(0.051)	(0.052)
t_9		9.38		
t_{10}				8.86
Observations	385	383	247	211
N	36	36	36	36
R^2-squared	0.589	0.482	0.685	0.703
F-test	92.64***	78.18***	134.13***	102.31***
VIF	1.35	1.5	1.07	1.63

Notes: Estimated coefficients (standard errors) of the estimation of equation (1). The dependent variable is CPI, which is the corruption perception index by each European country, calculated by the Transparency Organisation. LogGDP_pc measures the logarithm of GDP per capita in each EU country. WoBoard is the percentage of women that are members of the board of companies for each of EU country. WoCEO is the percentage of women that are CEO or Chairman of a company for each of EU country. DumRoL takes value 1 if the value is higher that the mean of the variable Rule of Law (RoL) and 0 otherwise. R^2-squared and *F*-test are test to validate the regression VIF is variance inflation factor, *ti* is the *t* statistic for the linear constraint test under the following null hypothesis: $H_0 : \breve{i} + \breve{j} = 0$ where $\breve{i}$ and $\breve{j}$ are the coefficients of the variable Woboard and the variable Woboard*DumRoL, in columns 1 and 2, the coefficients of the variable WoCEO and WoCEO*DumRoL in columns 3 and 4, respectively. ***, ** and * indicate significance at the 99%, 95% and 90% confidence level, respectively.

Results shown in Table 7 indicate the relationship between the corruption level and the presence of women in decision-making positions in the private sector (board's membership, CEO or directorship of big corporations) according to the level of gender inequality of each European country,[2] as Model 2.2 indicates.

Results obtained are not significant. Similarly to the case of the public sector model, the dummy variable (DumGII) is substituted by the dummy variable (DumRoL) and results are reported in Table 8.

In the second column (2), the coefficient of the (WoBoard) and the interaction variable (Woboard*DumRoL) are not statistically significant. In column (3), when the dummy variable of the rule of law equals zero, the influence of Women as CEO is not significant. In column (4), the coefficient of the (WoCEO) is negative and significant, although the interaction variable (WoCEO*DumRoL) is positive and statistically significant.

Therefore, when the dummy variable (DumRoL) equals one, the influence of a greater presence of women in CEO positions and the corruption level is obtained from the sum of the WoCEO coefficients ($\beta_1 = -0.099$) and their interaction ($\beta_2 = 0.102$). The joint effect is still positive and statistically significant ($t_{10} = 8.36$). In line with the paper thesis, these results show that, in a context of greater equality, increasing the number of women in CEO positions still reduces the level of corruption in a country.

Results in Table 8 partially confirm the second hypothesis implying that increasing the presence of women in decision-making positions in the private or corporate sector reduces the level of corruption. According to the results, this relationship can be proved even in countries scoring high on gender equality. Therefore, the relative influence of increasing the number of women in chairperson positions can be considered a relevant factor when Gender Inequality Index and Rule of Law are taken into consideration, contrary to the *fairer system thesis*. Nevertheless, the absence of significance in the results of the (WOoBoard) variable's coefficients do not confirm the influence of the presence of women on boards being relevant for the reduction of corrupt attitude. This can be explained by the fact that the presence women on direction boards in European countries, as can be seen on Table 1 and Appendix B, is still low, as their representation is always below 50% and, though it is increasing year by year, it is as yet, far from reaching gender balance.

The correlation matrices are shown in the Appendix D for the variables of the model (2.1) and (2.2).[3]

5 Conclusions

Does gender really influence attitudes towards corruption? Results can evidence that a greater presence of women in decision-making positions reduces the level of corruption. The study analyses the influence of women on level of corruption of European countries during the period 2010–2020. Northern European countries, such as Finland, Norway and Denmark, generally show better results not only in terms of equality, but also in terms of compliance with the rule of law. Consequently, the percentage of women in positions of power both in the public sphere (public administration, parliament and government) and in the corporate one (direction boards of large companies and CEOs) is higher than in Eastern and Southern European countries. The results provided by the Corruption Perceptions and Corruption Control Indices show that it is exactly in those countries

where the percentage of women in positions of responsibility is greater, where the control over corruption is the highest and where the lowest levels of fraud are achieved.

Even though results can reflect other issues and open the scope of the debate to other problems regarding inequality as the increasing pressure upon women to earn merits for overcoming glass ceilings, especially in some specific countries or regions. The results obtained in the study conflict with the convergence gender theory which defends that when equality is attain, gender will not make any difference towards corruption attitudes.

The possibility of the study's results not showing a direct causal relationship, should also be considered. However, the study has partially evidenced that a high percentage of women in decision-making positions in different areas of society does, indeed, correspond to low levels of corruption. Nevertheless, considering the increase in women presence as the basis of decreasing corruption rates, would be taking a simplistic perspective, as many other very relevant factors are left out of the analysis.

Moreover, the study corroborates the first hypothesis as those European countries with a higher level of development, greater respect for fundamental rights, a more consolidated civil and criminal justice system and a higher level of gender equality in all areas – labour, social, economic – are the ones with a lower corruption rate. While the second hypothesis is also verified, as these countries are the ones with a greater presence of women in decision-making positions, as members of the government and parliament but also as members of the most important firms' boards. Being also these countries the ones that fight corruption with the highest efficiency. Nevertheless, the relationship between corporate decision-making positions and corruption is less significant than the relation in the political sphere

Consequently, it can be inferred from the results that improving the overall score of gender equality and rule of law is substantially significant for fighting against corruption. Improving this score will lead to reductions in gender inequalities, improvements in equal opportunities and an increase in the percentage of women in decision-making positions.

Being aware of the controversy surrounding the critical analyses of European corruption cases form a gender perspective. This study aims to explain why the gender perspective of previous studies and the presence of women in decision-making positions, is just one factor from a wider list of them, which collectively benefit the rule of law, reduce gender inequalities and, therefore, reduce fraud and corruption cases.

Some of the limitations that this study faces are related to the limited amount of observations included in the sample, as it only considers 35 countries, with some variables being highly interlinked. However, the use of panel data has helped to overcome that limitation lengthening the period studied. Another limitation is that the focus and methodology of the paper is eminently statistical, therefore, it does not enter much into sociological or philosophical questions related to gender and behavioural theories.

As future research lines, this study opens the path for investigating the different attitudes towards risk and moral development in top decision-making positions from a gender perspective. Another line that remains open is the development of a more in-depth analysis of the relationship between gender and corruption only in those countries where gender equality and rule of law is higher, in order to map the potential underlying implications that this link has.

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Notes

1 Hausman test results (available on request) suggested to apply Fixed Effects (FE) instead of Random Effects (RE).

2 The information about the variable Women as CEO or Chairperson (WoCEO) for the European countries is only available since 2014 so, the results with this variable just cover the period 2014–2020.

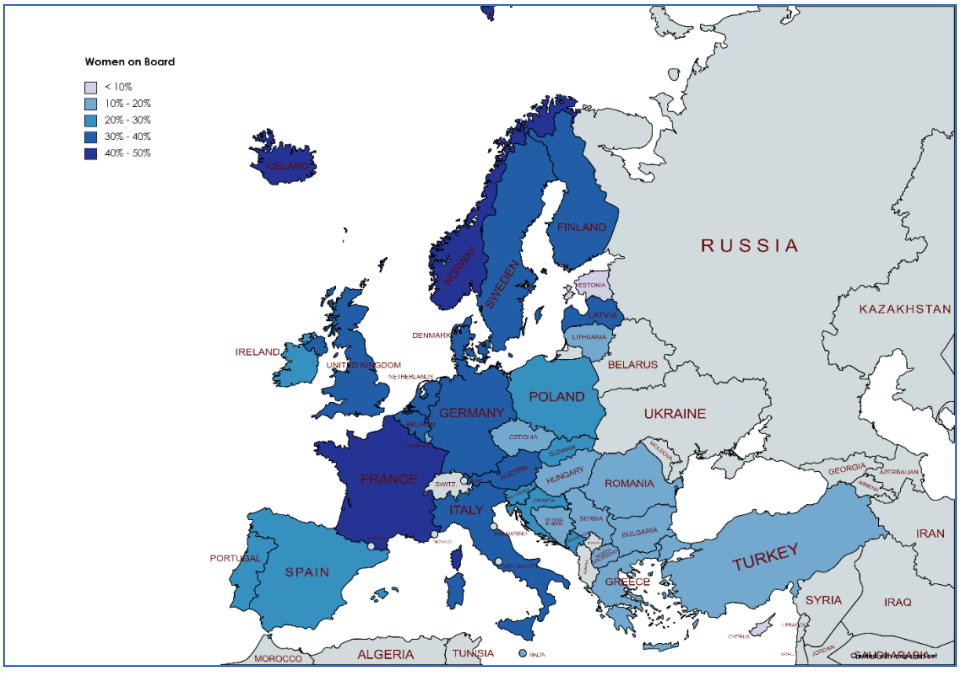
3 The use of different models is explained in Section 2 but, it is also adequate in order to separate the different variables of women in decision-making position, because of the potentially high correlation they may face.

Appendix A Variables definition

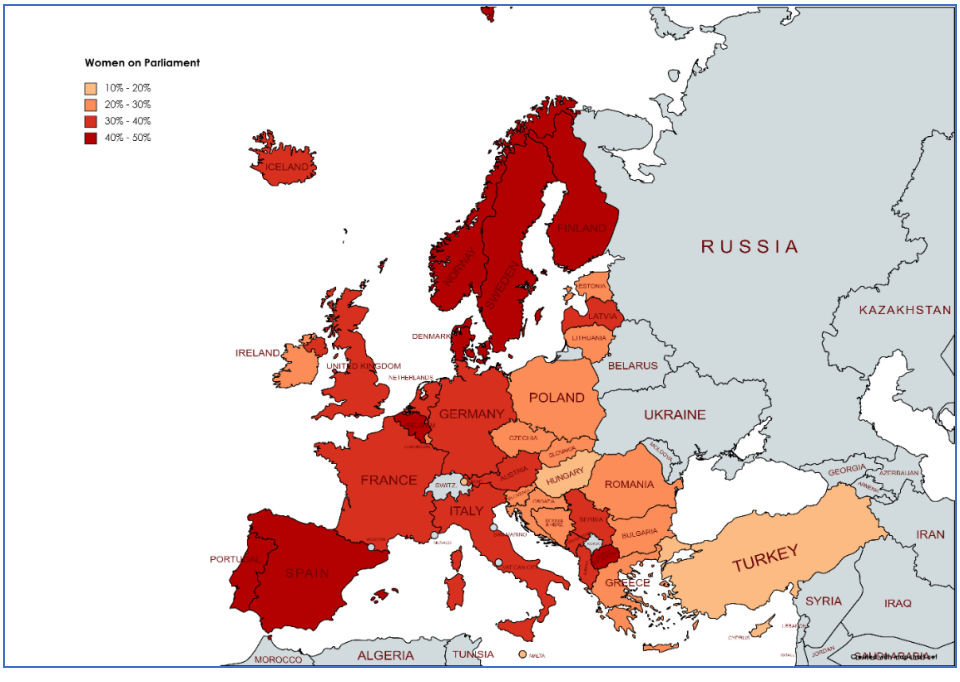
Variable	*Definition*	*Source*
CPI	Corruption Perception Index gives a transparency score to each country.	Transparency International
CCI	Control of Corruption Index indicates the extent of corruption in a country.	World Bank
LogGDP_pc	Logarithm of GDP per capita is gross domestic product divided by midyear population	World Bank
WoPar	Percentage of women presidents or members of both houses of national parliaments	European Institute for Gender Equality
WoGov	Percentage of women senior ministers in national governments	European Institute for Gender Equality
WoAdm	Percentage of women in the top two tiers of administrations in national administrations	European Institute for Gender Equality
WoCEO	Percentage of female CEOs or presidents of the largest listed companies in each country	European Institute for Gender Equality
WoBoard	Percentage of women on the board members of the largest listed companies in each country	European Institute for Gender Equality
RoL	Rule of Law Index shows the application of the rule of law in each country	World Justice Project
GII	Gender Inequality Index indicates the inequality that exists in a country	United Nations

Appendix B Maps

Women on boards



Women in parliament



Appendix C Statistical analysis by rule of law

Variable	*Mean*			*p Value*	*SD*	*Min*	*25%*	*75%*	*Max*
	ROL > Mean	*ROL < Mean*	*Total*						
CPI	0.659	0.465	0.616	0.00	0.169	0.32	0.46	0.77	0.94
CCI	1.13	0.033	0.884	0.00	0.875	–0.61	0.103	1.69	2.41
LOGGDP_pc	4.49	4.058	4.4	0.00	0.491	4	4	5	5
WoPar	0.284	0.244	0.275	0.00	0.991	0.087	0.202	0.365	0.496
WoGov	0.278	0.213	0.263	0.00	0.144	0	0.167	0.375	0.611
WoAdm	0.359	0.408	0.374	0.00	0.122	0.012	0.299	0.463	0.591
WoCEOP	0.069	0.103	0.081	0.00	0.062	0	0.034	0.105	0.3
WoBoard	0.203	0.181	0.199	0.00	0.104	0	0.118	0.267	0.481
GII	0.125	0.171	0.699	0.00	0.129	0.42	0.6	0.813	0.9

Appendix D Correlation matrices

Correlation matrix for Model (2.1) with 'Women in Government' variable

	CPI	*LogGDP_pc*	*WoGov*	*DumGII*	*DumROL*
CPI	1.0000				
LogGDP_pc	0.7930	1.0000			
WoGov	0.6086	0.6002	1.0000		
DumGII	–0.5340	–0.4666	–0.4308	1.0000	
DumROL	0.4926	0.3849	0.1870	–0.1678	1.0000

Correlation matrix for Model (2.1) with 'Women in Parliament' variable

	CPI	*LogGDP_pc*	*WoPar*	*DumGII*	*DumROL*
CPI	1.0000				
LogGDP_pc	0.7930	1.0000			
WoPar	0.5867	0.5641	1.0000		
DumGII	–0.5340	–0.4666	–0.4671	1.0000	
DumROL	0.4926	0.3849	0.1681	–0.1678	1.0000

Correlation matrix for Model (2.1) with 'Women in Administration' variable

	CPI	*LogGDP_pc*	*WoAdm*	*DumGII*	*DumROL*
CPI	1.0000				
LogGDP_pc	0.7930	1.0000			
WoAdm	–0.2226	–0.3536	1.0000		
DumGII	–0.5340	–0.4666	0.0975	1.0000	
DumROL	0.4926	0.3849	–0.1592	–0.1678	1.0000

Correlation matrix for Model (2.2) with 'Women on Direction Boards' variable

	CPI	*LogGDP_pc*	*WoBoard*	*DumGII*	*DumROL*
CPI	1.0000				
LogGDP_pc	0.7939	1.0000			
WoBoard	0.4447	0.5092	1.0000		
DumGII	–0.5369	–0.4690	–0.2765	1.0000	
DumROL	0.4873	0.3816	0.0900	–0.1645	1.0000

Correlation matrix for Model (2.1) with 'Women as CEO' variable

	CPI	*LogGDP_pc*	*W_CEO*	*DumGII*	*DumROL*
CPI	1.0000				
LogGDP_pc	0.8129	1.0000			
WCEO	–0.3585	–0.2494	1.0000		
DumGII	–0.4841	–0.4131	0.2358	1.0000	
DumROL	0.7058	0.4989	–0.2597	–0.2555	1.0000