
“Tax me, but don’t drown me in regulations: Understanding differences in corruption across the countries of Europe”

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Abstract

Differences in corruption perception across the countries of Europe are marked and persistent over time. This study seeks to explain these differences in the countries of both the European Union and the European Free Trade Association during 2007–2017. The core hypothesis is that the style of government intervention in the economy –rather than the size of government– is the main explanatory factor for the differences. To test this hypothesis, the empirical analysis disentangles the effects of the two main government tools for intervention in the economy: taxation and regulation. The main result is that the fiscal burden does not consistently present a significant relationship with corruption. In contrast, the regulatory burden associated with excessive red tape is a strong driver of corruption, because a consistent and significant positive association is found. Furthermore, differences in legal origins, history, democratic experience and several economic factors contribute to explaining differences between European countries.

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Introduction

Corruption negatively affects investment and growth (Mauro, 1995; Beekman, Bulte and Nillesen, 2014). In its political variety, corruption has been defined as “the abuse of entrusted power by political leaders for private gain” (Transparency International, 2004: 1). Based on this definition, it is perhaps only natural to draw a relationship between corruption and government size, simply because an increase in the latter provides more opportunities for bureaucrats and politicians to engage in activities with a potential for corruption (Rose-Ackerman, 1999). In a similar vein, both Tanzi (1997) and Alesina and Angeletos (2005) confirm that the larger the government the greater the likelihood of corruption, while Goel and Nelson (1998) report that the size of the state and local government has a direct association with corruption in the United States. Similarly, Dreher, Kotsogiannis, and McCorriston (2007) and Buehn and Schneider (2012) find that government size is positively related to corruption; however, the results in Treisman (2000) point to contradictory outcomes in this regard.

Government size is a relative term and it is frequent in the literature to use a fiscal measure [though see Buehn and Schneider (2012) for an exception]. However, taxation is just one of the tools available to governments to intervene in the economy and it does not, in itself, define the overall size of government. For this reason, the relationship between corruption and government size as reported in earlier studies might be misleading, given that fiscal size does not necessarily influence – as Alesina and Angeletos (2005) also point out – the level of corruption. A similar conclusion is drawn by Rothstein and Teorell (2008) who claim that the Nordic countries, with their low levels of corruption and high levels of public spending and fiscal government intervention (compared not only with countries worldwide, but also with other European countries), obviously contradict this belief.

The focus of this study is to account for the remarkable differences in corruption perception across the countries of Europe. The core hypothesis is that –rather than the size of government– the style of government intervention in the economy is the main explanatory factor for these differences. To test this hypothesis, the analysis distinguishes between the effect of the two main tools for government intervention in the economy: taxation (fiscal burden) and regulation (regulatory burden).

It is my contention that the regulatory burden is a major trigger of corruption. In other words, the heavier the regulatory burden, the more and bigger are the opportunities for corruption or related activities, thus increasing the presence of corruption. In this regard, this analysis echoes Hart, Shleifer, and Vishny’s (1997) hypothesis that contractual government intervention (or “private management under contractual regulation” as they described it) has a stronger effect on corruption than does direct government activity (or, again to use their terms, “public management”). Hence, this study also contributes to the existing literature by providing an analysis of the effects of the regulatory burden on corruption.

The research reported here was conducted on both the European Union (EU) and the European Free Trade Association (EFTA) countries in the period 2007–2017. Obtaining precise data on corruption is difficult, the reason for this being obvious: those involved in corruption naturally seek to hide its presence. For this reason, developing a reliable corruption index has attracted much scholarly attention. Indeed, in the literature, corruption is most usually measured by applying a corruption index developed by a reputable organization. For example, among the most widely used indexes we find the Corruption Perception Index (CPI), published by Transparency International, and those included in the Global Competitiveness Reports of the World Economic Forum. The latter are based on surveys questioning business executives and experts about their perceptions of corruption.

For this study, I have opted for the index developed each year by the World Economic Forum, the Global Competitiveness Index (GCI); however, it is worth stressing that for the period under analysis, 2007–2017, corruption perception as measured by the GCI and the CPI presented a correlation of 0.954 ($p < 0.000$). For my purposes here, the GCI also provides a measure of regulatory burden within a country (captured as “Burden of government regulation”), which I use as a key explanatory variable. This means that the data for the dependent variable and the data for the key explanatory variable are homogeneous, being obtained from the same source and using the same methodology.

The empirical analysis allows the effects of taxation and regulation to be disentangled. The study’s main result is that the fiscal burden does not present any significant relationship with corruption and, therefore, it does not contribute to explaining the differences in corruption between the European countries. In contrast, the regulatory burden appears to be a strong driver of corruption, because a consistent and significant positive association between corruption and regulation is found. Furthermore, differences in legal origins, consolidation of democracy, openness of the economy, and education contribute to explaining differences in this regard between European countries.

Factors affecting corruption: Background and hypotheses

The literature has considered many factors as potential drivers of corruption. Treisman (2007) is particularly comprehensive, as it considers factors related to colonial history, religion, ethnic divisions, socioeconomic characteristics, institutions, and government. The empirical analysis described below includes the countries of the EU and the EFTA; hence, it deals with a relatively homogeneous area in terms of history, religion, and ethnicity. For this reason, the focus is placed first on institutional factors. Later, attention switches to government intervention in the economy and, particularly, regulation. Finally, economic and social factors are considered.

Institutions and democracy

Institutional factors are perhaps the most important determinants to consider when seeking to explain what triggers (or prevents) corruption. In recent decades, a notable body of research has been built up suggesting that a country's administrative traditions or legal origins are strongly correlated with its economic outcomes as well as its legal rules and regulations. Painter and Peters (2010) distinguish between four Western administrative traditions: Anglo-Saxon Law (Common Law), Napoleonic or French Law (Civil Law), German Law and Scandinavian Law. Dominant state traditions are defined mainly by the relationship between the state and civil society (Painter and Peters, 2010). In this regard, the pluralist Anglo-Saxon tradition contrasts markedly with the heavily hierarchical, interventionist Napoleonic tradition. Both German and Scandinavian traditions are characterized as being organicist, with an emphasis on open government in the case of Scandinavian Law (Painter and Peters, 2010). These differences in interventionism and discretionary power could well have an impact on corruption. La Porta, Lopez-de-Silanes, and Shleifer (2008) adopt a broad view of legal origin as a means of socially controlling economic life, in what they refer to as their Legal Origin Theory. In their empirical analysis these authors find Anglo-Saxon common Law to be associated with lower levels of corruption than those associated with French civil law.

Still within the domain of historical legacies, the potential influence of having a colonial history on differences in corruption has recently been stressed (i.e. Treisman, 2007), after first being mooted in papers by Lambsdorff (1999) and Leite and Weidmann (1999). Indeed, the influence of colonial history was empirically analysed in Treisman (2000), who found it to be significant.

The hypothesis that democracy contributes to reducing corruption has been frequently tested in empirical analyses. Typically, it is concluded that it has a negative effect (that is, it reduces) corruption perception (Treisman, 2000, 2007; Montinola & Jackman, 2002; Mohtadi and Roe,

2003; Kalenborn and Lessmann, 2013). However, the relationship would seem to be far from linear (Montinola and Jackman, 2002). In cases where there is a weakening in extreme autocracies or where political freedoms are gained, perceived corruption seems to decrease. However, in cases of imperfect democracies, small increases in freedom do not seem to have a direct impact on corruption perception. Overall, most of the available evidence indicates that long-established democracies present lower levels of corruption than those presented by young democracies or authoritarian regimes (Treisman, 2007; Mohtadi and Roe, 2003; Kalenborn and Lessmann, 2013).

Thus, with respect to institutions and democracy, I formulate the following hypotheses:

H₁: A French legal origin (Civil law) is associated with greater corruption

H₂: Having a colonial history is associated with greater corruption

H₃: Senior democracies present lower levels of corruption

Government intervention

Government size has been positively associated with corruption for some time, because, as mentioned in the introduction, an increase in government size provides more opportunities for bureaucrats and politicians to engage in activities with a potential for corruption (Tanzi, 1997; Rose-Ackerman, 1999; Alesina and Angeletos, 2005). Empirical analyses reported by Dreher, Kotsogiannis, and McCorriston (2007) and Buehn and Schneider (2012) found government size to be positively related to corruption, but Treisman (2000) presented contradictory findings. More specifically, Goel and Nelson (1998) and Buehn and Schneider (2012) found a positive association between fiscal pressure and corruption while lower fiscal freedom increased corruption. In contrast, McGee (2008) and Dreher and Schneider (2010) found fiscal pressure to be negatively associated with corruption. Overall, the findings in the literature regarding the effect of taxation and fiscal pressure on corruption are diverse and contradictory.

Although scarcer than the research on fiscal pressure and corruption, research on the effect of the regulatory burden on corruption has tended to reach more of a consensus, frequently finding a positive relationship between the regulatory burden and corruption. Djankov et al. (2002) investigated the number of procedures an entrepreneur must face before they can operate a business legally and the effect this has on corruption. The authors found that countries in which the number of procedures was greater experienced more corruption. In another interesting study, Fazekas (2017) analyses the effect of different types of regulations on bribery and government favouritism. He finds that the effect of different types of regulations is context-dependent and suggests stronger potential to reduce corruption by decreasing regulations related to day-to-day business-state interaction, contract enforcement, and registering property.

Another study that specifically relates regulation and corruption is Holcombe and Boudreaux (2015), who seek to explain why Scandinavian countries present lower levels of corruption despite their having relatively large governments, when measured in fiscal terms. They run a cross-sectional analysis on a worldwide sample of countries and find that while government expenditure has a weak association with corruption, regulation has a strong positive effect. This would appear to explain the Scandinavian paradox.

When analysing the potential effect of regulation on corruption, we need to be aware of the potential endogeneity in the relationship. Knack and Keefer (1995) suggest that countries that allow public officials to demand large and arbitrary bribes also inhibit those officials from credibly following through their future commitments, which in turn shapes the characteristics of inefficient regulation. Further, Krueger (1993) argues that corrupt bureaucrats will intentionally introduce new regulations and red tape, to be able to extract more bribes by threatening to deny permits. Hence, it may well be that it is in fact corruption that promotes regulation, which is consistent with Shleifer and Vishny's (1993) view that many regulations exist because they provide the opportunity for officials to obtain benefits from their

discretionary power. This issue is specifically addressed below, when implementing the empirical strategy.

Regarding the style of government intervention, I formulate the following hypotheses:

H₄: The regulatory burden on an economy increases corruption

H₅: The fiscal burden does not have a significant relationship with corruption

Economic and social factors

Several studies have examined the effect of the shadow economy on corruption (Dreher, Kotsogiannis, and McCorriston, 2009; Buehn and Schneider, 2012), using unemployment as one of the main indicators of this informal economy. Other papers have focused on the direct effect of unemployment on corruption. Most studies find that unemployment reinforces corruption (Saha, Gounder, and Su; 2009; Peña-Miguel and Cuadrado-Ballesteros 2019), although Saha and Su (2012) do not find a direct relationship between the two.

The relationship between trade openness and corruption was first tested by Krueger (1974), who reports that trade restrictions divert resources from productive activities to corruption and other forms of rent seeking. Ades and Di Tella, (1999), however, suggest a more ambiguous theoretical relationship between trade and corruption. Trade restrictions reduce market competition and generate extra rents, thus triggering corruption. Yet, lower levels of competition increase the value of corruption avoidance and, as a result, trade restrictions may reduce corruption. Indeed, the authors' empirical analysis supports the insight that trade openness reduces corruption. The same outcome is reported by Sachs et al (1995), Ades and Di Tella (1997), Treisman (2000), Leite and Weidmann (1999) and Gatti (2004), whereas Torrez (2002) and Majeed (2014) find more mixed results.

Individuals with a lower level of education tend to have more difficulties in understanding public policies and the workings of government (Rose-Ackerman, 1999). In contrast, citizens in countries with higher levels of educational attainment are better able to identify practices that undermine the correct functioning of institutions, such as corruption, and are less tolerant of them (Hakhverdian and Mayne, 2012). An influential study examining the effect of education on corruption is that undertaken by Glaeser and Saks (2006), who analyze the drivers of corruption in the United States and find education to be negatively associated with corruption. Most subsequent studies also find a negative effect of education on corruption (e.g. Truex, 2011; Asongu and Nwachukwu, 2015, Peña-Miguel and Cuadrado-Ballesteros 2019). However, Buehn and Schneider (2012) fail to find a significant relationship between the two. Finally, we turn to the relationship between economic development and corruption. The negative effect of economic development on corruption perceptions has long been reported (La Porta et al.; 1999, Treisman, 2000; Holcombe and Boudreaux, 2015). In fact, Treisman (2007, p. 223) considers this association as “[by] far the strongest and most consistent finding of the new empirical work”. Hence, I formulate the following hypotheses:

H₆: Unemployment is positively related to corruption.

H₇: The level of economic openness is negatively related to corruption.

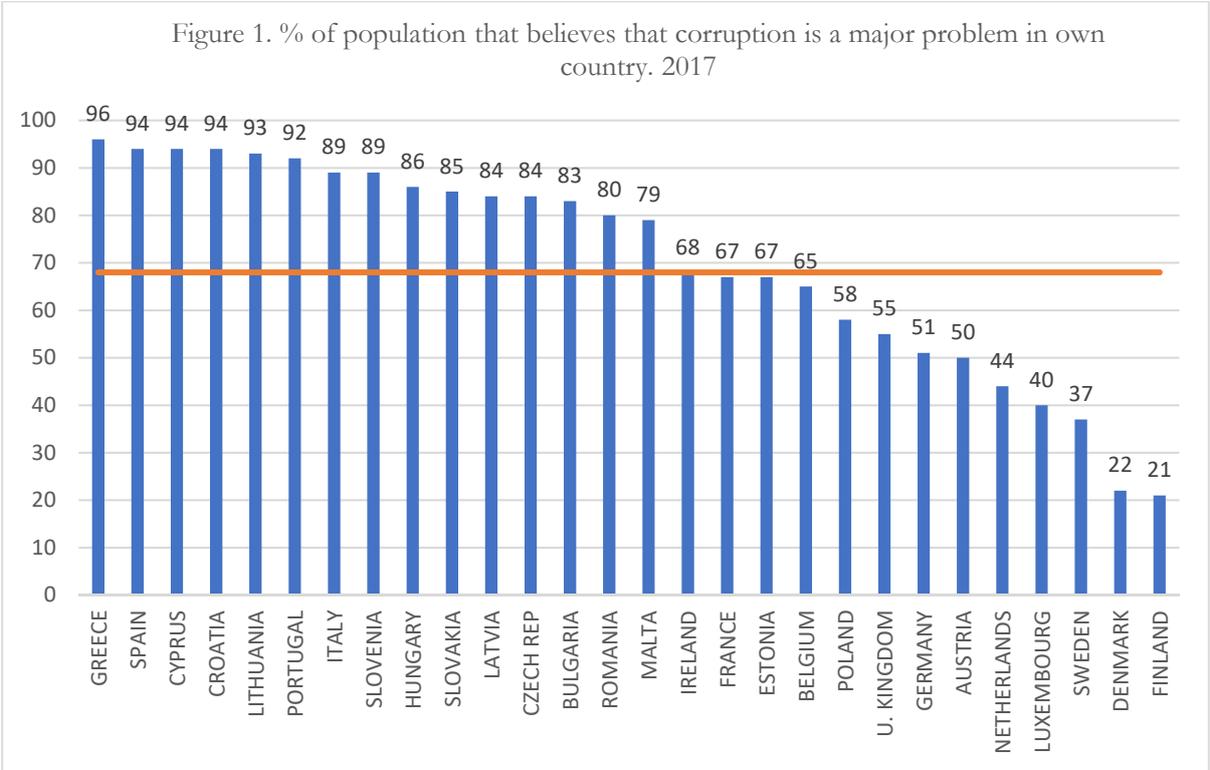
H₈: The level of educational attainment is negatively related to corruption.

H₉: Economic development is negatively related to corruption.

Corruption in European countries

A sizeable majority of Europeans believe corruption to be a major problem within their country, as indicated by various Eurobarometer Surveys published since 2005 (see Figure 1, and map 1), although there is considerable divergence across the countries of the EU. Data from the 2017

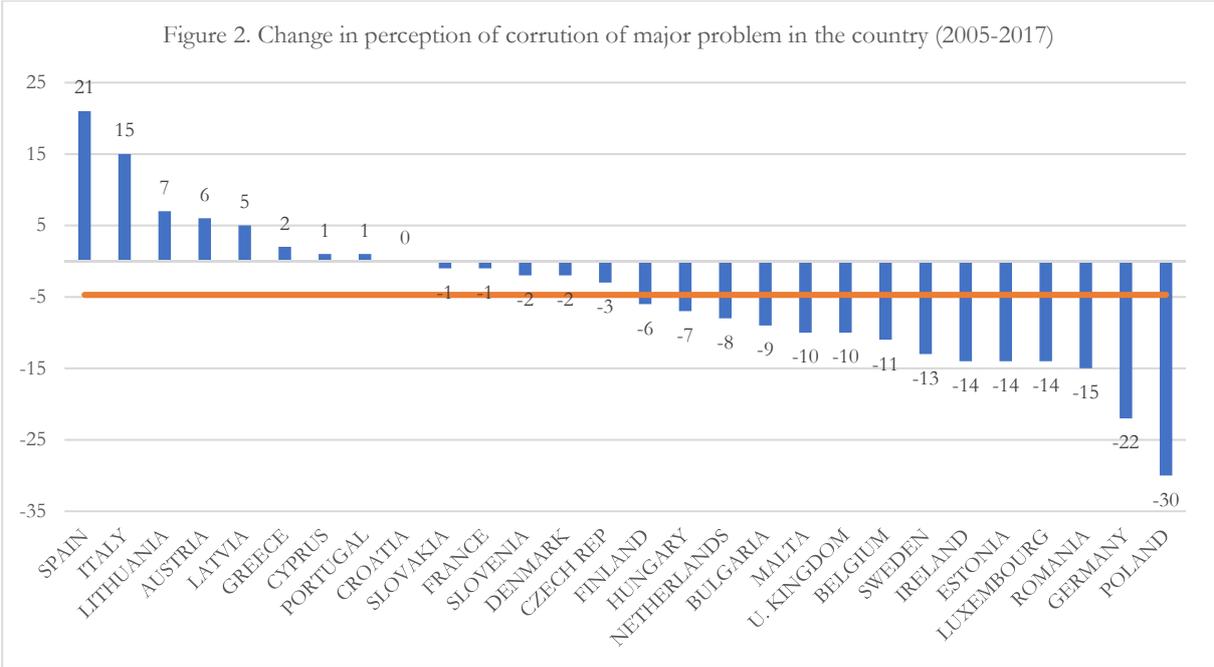
Eurobarometer Survey (European Commission, 2017) seems to adhere to a two-out-of-three rule: thus, two out of three of the population in EU countries believe corruption to be a widespread problem, while in two out of three of all EU countries, two out of every three citizens or more believe corruption to be a major problem.



Map 1: Perception of corruption as a major problem in own country, 2017



This high perception of corruption is persistent over time: between 2005, when the first Eurobarometer Survey was conducted, and 2017, the overall perception within the EU has fallen just four percentage points (p.p.) from 72 to 68% (or 67%, if we exclude from the 2017 figures the three countries not included in the 2005 Survey, that is, Romania, Bulgaria, and Croatia). Figure 2, however, shows the diversity in changing perceptions across the EU, from a 21 p.p. increase in Spain to a 30 p.p. decrease in Poland. Yet no clear pattern (either regional or economic-related) emerges from these data about these shifting perceptions of corruption, besides the fact that perception of corruption tended to increase in Southern countries (see map 2)



Map 2: Change in perception of corruption as a major problem in own country, 2005-2017



Parallel to concerns with corruption in the institutional arena, scholarly research has paid increasing attention to other manifestations of corruption, identified as constituting a problem in most EU countries (Charron, 2016). For example, Kartal (2014) finds that while in the pre-accession period (pre-candidacy) incentives from the EU institutions contributed to controlling corruption among East European candidates, following accession this control over corruption was weakened. Yet, recent research by Elbasani and Šelo Šabić (2018) challenges the fact that pre-accession efforts were successful in controlling corruption in the cases of Croatia and Albania. Elsewhere, Peña-Miguel and Cuadrado-Ballesteros (2019) analyse the effects of privatization on corruption perception (for outcomes see below), while Pellegata and Memoli (2016) find a negative effect of corruption on confidence in political institutions across the EU. In a further examination of institutional confidence, Bauhr and Charron (2019) find that support for within EU-redistribution policies is contingent upon perceptions of corruption. Thus, corruption perception in countries in which the quality of government is low tends to increase support for within-EU redistribution policies, but the contrary occurs in contexts where the quality of governmental institutions is high.

While factors related to perceptions of corruption have been empirically analysed for different countries, regions, and local jurisdictions (see, for instance, Bauhr and Charron, 2019; Bauhr, Charron, and Wängnerud, 2019), to the best of my knowledge, only one unpublished paper, MacDonald and Majeed (2011), has attempted to explain differences in the causes of corruption across Europe using cross-country data and multivariate techniques. MacDonald and Majeed (2011) draw on data from the corruption perception index published by the International Country Risk Guide (ICRG) for five-year average periods between 1984 and 2007 for the EU-25 Member States. They analyse the potential effect of several factors, using aggregate indicators obtained mainly from the ICRG, and find that rule of law, economic development, and government size (measured in terms of government expenditure) reduce corruption. A not

dissimilar study was conducted by Peña-Miguel and Cuadrado-Ballesteros (2019) in their examination of the relationship between privatization and corruption. The authors use as their controls a set of economic variables similar to the ones used herein and find corruption to be positively associated with unemployment and foreign trade, and negatively related to education and economic development.

The empirical strategy deployed in the following sections is closely connected to that adopted by MacDonald and Majeed (2011). Here, however, I further contribute to the literature by using full annual data sets for the period 2007–2017 for all EU-28 Member States plus three EFTA members (Iceland, Norway, and Switzerland). This results in a database with 431 observations, four times the size of that employed by MacDonald and Majeed (2011). Additionally, I use a variety of specifications for institutional, social and economic variables, and disentangle the effect of government intervention by distinguishing between fiscal and regulatory pressures.

Data and methods

Data

To undertake this research a database was first built for the EU-28 Member States plus Iceland, Norway and Switzerland. All data were obtained from publicly available sources. Among these, particular mention should be given to information contained in the Global Competitiveness Report (World Economic Forum) –henceforth the GCR– from which data on corruption perception and regulatory burden were obtained for all countries. The database begins in 2007 for two reasons: First and most importantly, the accession of Romania and Bulgaria to the EU in that year virtually completed the expansion of the Union to the countries of Eastern European (the accession of Croatia in 2013 poses no problem as data are available for this country as far back as 2007); and, second, 2006 is the first year for which a wholly comparable GCR was published. This is important because in order to control for endogeneity our generalized method of moments (GMM) model includes a lag variable for the corruption index (see below for

detailed explanation) and had 2006 been used as our cut-off point it would not have been possible to include this lag.

Data for most of the economic and social variables were obtained from Eurostat. Data about the openness of the economy were obtained from the OECD and World Bank national accounts. Data on institutional and democracy-related variables were obtained from the dataset in La Porta et al. (2008), the Special Committee on Decolonization (United Nations), and the individual countries' institutional web pages.

Variables

The dependent variable is the *Corruption_Index* (CI) included as indicator 1.05 in the GCR, capturing perceptions with regard to irregular payments and bribes.¹ Given the way in which the scale is constructed in the Report and in order to facilitate direct interpretation, the index is reversed here multiplying by (-1).

Indexes based on opinion surveys are open to criticism on the grounds that they may be affected by the media, anticorruption campaigns or politically motivated accusations. Lambsdorff (2004) discusses the relative strengths and shortcomings of such perception indexes but stresses the lack of alternatives. Certainly, perceived corruption has its flaws and potential biases; nonetheless, perception indexes present a high degree of inter-correlation, suggesting that despite differences in their respective methodologies, they have a common output, that is, corruption. Indeed, the high correlation between different indexes is indicative of their consistency. In this case, and as mentioned earlier, a correlation of 0.95 is found between the GCR indexes and the CPI published by Transparency International for the period 2007–2017.

¹ The GCR is compiled from a survey conducted among business executives and experts. The indicator is an average score across the five components of the following question: “In your country, how common is it for firms to make undocumented extra payments or bribes connected with (a) imports and exports; (b) public utilities; (c) annual tax payments; (d) awarding of public contracts and licenses; (e) obtaining favorable judicial decisions? In each case, the answer ranges from 1 [very common] to 7 [never occurs]”.

Furthermore, a correlation of 0.87 was found between GCR data for 2017 and corruption perception as measured in the Eurobarometer (2017).

Additional support is obtained here from the fact we include EU and EFTA countries in our observation group, since, to a certain degree, this controls for major cultural differences, providing us with relatively homogenous data compared to that used in worldwide studies. Finally, it is worth pointing out that Charron's (2016) study, conducted in EU countries, finds that the corruption perceptions of citizens that have personally experienced public sector corruption and those who have not are similar. Likewise, Charron found considerable consistency between citizen and expert assessments of corruption. Hence, Charron (2016, p. 167) claims that "little evidence is found in support of critics' claims that corruption perceptions are driven by outside noise, at least in the sample European countries and regions".

The first set of explanatory variables comprises institutional and democracy-related variables. First, I include variables capturing *Legal_origin* (i.e. the four Western administrative traditions): *Civil_Law*, *Common_Law*, *German_Law* and *Scandinavian_Law* (Painter and Peters, 2010). Similarly, and in relation to historical legacy, I include the variable *Colonial_History*, capturing the EU states that were former colonies and which won independence after World War II (i.e. Cyprus and Malta).

In the case of democracy-related variables, I first include the variable *Senior_Democracies*, a dummy variable that differentiates between (1) countries with democratic regimes before the breakdown and dissolution of the Soviet Union and those that accessed democracy later. As time-invariant variables cannot be included in several sets of the estimations, I later consider the variable *Years_Democracy*, measuring the number of years of uninterrupted democratic regime after World War II [which resembles Treisman's (2007) decision to consider democratic regimes since 1950]. The relationship between democracy and corruption is not linear

(Montinola and Jackman, 2002). Given the distribution of *Years_Democracy*, this variable is transformed to its logarithmic form, to bring it closer to a normal distribution.

Next, we consider variables of government intervention. Here, I first include *Regulatory_Burden*, which measures the burden of compliance faced by companies as they adhere to the requisite procedures of the public administration, that is, the burden of red tape.² As with the *Corruption_Index*, the index is reversed (multiplied by -1) to facilitate direct interpretation. Additionally, the variable *Fiscal_Pressure* measures total government revenues as a percentage of GDP.

Finally, I include several economic and social variables. *Unemployment* is the rate of unemployment; *Openness* measures the weight of foreign trade in GDP; *Education* captures the percentage of population (active, 16-64 years) with tertiary education (levels 5 to 8 Eurostat); and *GDPpc_ppp* captures the gross domestic product per capita (purchasing power parity adjusted). Table 1 summarizes the information on these variables, their sources, and expectations.

Methodology

I use a panel dataset for the period 2007–2017 to analyse the relationship between corruption perception and a set of explanatory variables. The panel data model is specified as follows, where sub-indices *i* and *t* represent country and year, respectively:

$$Corruption_Index_{it} = \beta_0 + \beta_1 Legal_origin_{it} + \beta_2 Colonial_History_{it} + \beta_3 Senior_Democracy_{it} + \beta_4 Regulatory_Burden_{it} + \beta_5 Fiscal_Burden_{it} + \beta_6 Unemployment_{it} + \beta_7 Openness_{it} + \beta_8 Education_{it} + \beta_9 GDPpc_ppp_{it} + e_{it} \quad (1)$$

² This indicator, code 1.09 in the GCR-WEF, is obtained from the answer to the question “In your country, how burdensome is it for companies to comply with public administration’s requirements (e.g., permits, regulations, reporting)? [1 = extremely burdensome; 7 = not burdensome at all]”. This question measures the incidence of red tape: that is, official rules and processes that seem unnecessary and delay results, thus exerting a significant and unjustified compliance burden (Moynihan and Herd, 2000), no matter whether they pursue legitimate objectives (Herd and Moynihan, 2018, p. 18). Note that Bozeman and Feeney (2011) would exclude from such procedures those related to socially desirable objectives.

All variables are described in Table 1 and e_{it} is the error term. For *Legal_origin*, I include *Common_Law*, *German_Law* and *Scandinavian_Law* (with *Civil_Law* as the reference category). Table 2 reports the descriptive statistics. The correlation matrix is available in Table A1, in the appendix.

Table 1. Variables, data, sources and expectations

Variable	Measure	Source	Expected effect on corruption perception
Dependent			
<i>Corruption_Index</i>	Corruption Perception	GCR-WEF (Code #1.05)	
Independent			
<i>Civil_Law</i>	Civil Law Origin	Data Set La Porta et al (2008)	H ₁ : Civil Law (French legal origin) is associated with higher corruption
<i>Common_Law</i>	Common Law Origin		
<i>German_Law</i>	German Law Origin		
<i>Scandinavian_Law</i>	Scandinavian Law Origin		
<i>Colonial_History</i>	Post WW decolonized states	UN Special Committee on Decolonization	H ₂ : Positive
<i>Senior_Democracy</i>	Democratic System before the fall of the Soviet Union	Countries' institutional data sources	H ₃ : Negative
<i>Years_Democracy</i>	Years of uninterrupted democratic regime after world war II.	Countries' institutional data sources	H ₃ : Negative
<i>Regulatory_Burden</i>	Burden of the regulatory system	GCR-WEF (code #1.09)	H ₄ : Positive
<i>Fiscal_Burden</i>	Total general government revenue as a % of GDP	Eurostat	H ₅ : Uncertain
<i>Unemployment</i>	Rate of unemployment	Eurostat	H ₆ : Positive
<i>Openness</i>	Imports + exports combined as a % of GDP	World Bank and OECD National Accounts	H ₇ : Negative
<i>Education</i>	% population with tertiary education (levels 5-8)	Eurostat	H ₈ : Negative
<i>GDPpc_ppp</i>	Gross Domestic Product per capita (ppp adjusted)	Eurostat	H ₉ : Negative

Source: Author

Table 2. Descriptive statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
<i>Corruption_Index</i>	341	-4.305	1.215	-6.379	-2.205
<i>legor_fr</i>	341	0.355	0.479	0	1
<i>legor_uk</i>	341	0.097	0.296	0	1
<i>legor_ge</i>	341	0.387	0.488	0	1
<i>legor_sc</i>	341	0.161	0.368	0	1
<i>Colonial_History</i>	341	0.065	0.246	0	1
<i>Senior Democracy</i>	341	0.645	0.479	0	1
<i>Years Democracy</i>	341	47.610	20.966	16	72
<i>Regulatory Burden</i>	341	-3.275	0.71	-4.952	-1.901
<i>Fiscal Burden</i>	341	42.628	6.717	25.8	59.2
<i>Unemployment</i>	341	8.613	4.54	2.25	27.47
<i>Openness</i>	341	120.894	66.831	45.609	412.869
<i>Education</i>	341	25.395	7.414	9.9	40.4
<i>GDPpc_ppp</i>	341	28037	11841	10400	77300

The Breusch-Pagan test for heteroscedasticity yields $p < 0.05^{**}$, thus allowing us to reject homoscedasticity. The average variance inflation factor (VIF) is 3.21 and $GDPpc_ppp_{it}$ has an individual VIF above six. When we exclude $GDPpc_ppp_{it}$ from the model, the average VIF falls to 2.35 and all individual VIFs are below four. Results are presented with the sequential introduction of variables in the model, so that any effects of potential confounding can be observed.

The Hausman test yields $p < 0.000$, which indicates that a fixed-effect estimation is more appropriate. I retain the results of the random-effects GLS estimations, which enables me to check the effects of the legal, historical and institutional variables with time-invariant form. Next, in the fixed estimations, I replace *Senior_Democracy* with *Years_Democracy*, so that the effect of the consolidation of democracy can be considered. Note, however, that the inclusion of this variable in the random estimations (instead of *Senior_Democracy*) leaves the results unchanged.

As mentioned in section 2 above, there are concerns regarding endogeneity in the relationship between *Regulatory_burden* and *Corruption_index*. To deal with this problem, we use the difference-GMM panel data specification developed by Arellano and Bond (1991).³ We include as our explanatory variable the lagged dependent variable. Difference-GMM panel data estimations rely on a series of lagged variables that are then differenced and used as instruments. As such, it is helpful to deal with potential issues of endogeneity.

Results

Table 3 shows the results obtained from the random-effects GLS estimations, with time effects. From this set of estimations, and within the domain of variables related to government intervention, we see that *Regulatory Burden* is significantly and positively associated with corruption (i.e. the greater the regulatory burden, the greater the perception of corruption). In contrast, *Fiscal_Burden* does not present any relationship with corruption. Both results are in accordance with expectations.

The same is true of all variables capturing economic and social factors: all of them are related with the corruption index, but while *Unemployment* is positively associated to corruption, *Openness*, *Education*, and *GDPpc_ppp* present a negative association: i.e. the greater the level of foreign competition, educational attainment and economic development, the lower the perception of corruption. Note, however, that the Hausman test suggests that the fixed-effect estimation is more appropriate for our data base, so we need to return to these variables later.

³ An alternative way of dealing with endogeneity is to use instrumental variables. However, homoscedasticity was rejected with the Breusch-Pagan test, and with heteroscedasticity conventional IV estimators are inefficient (Baum, Schaffer, and Stillman (2003, p. 1)

Table 3. Results from random-effects GLS estimation

Variables	(1) Random	(2) Random	(3) Random	(4) Random	(5) Random	(6) Random	(7) Random
<i>Common_Law</i>	-0.533 (0.511)	-0.288 (0.342)	-0.246 (0.302)	-0.293 (0.275)	-0.468* (0.267)	-0.122 (0.257)	-0.136 (0.261)
<i>German_Law</i>	-0.587 (0.381)	-0.403 (0.255)	-0.405* (0.223)	-0.333 (0.203)	-0.370* (0.196)	-0.368** (0.173)	-0.331* (0.178)
<i>Scandinavian_Law</i>	-1.409*** (0.413)	-1.1032*** (0.280)	-1.058*** (0.255)	-0.931*** (0.235)	-1.083*** (0.229)	-0.893*** (0.210)	-0.862*** (0.214)
<i>Colonial_History</i>	0.530*** (0.596)	0.622 (0.398)	0.633* (0.347)	0.665** (0.315)	1.064*** (0.314)	0.853*** (0.284)	0.597* (0.315)
<i>Senior_Democracies</i>	-1.749*** (0.380)	-1.577*** (0.254)	-1.600*** (0.228)	-1.531*** (0.208)	-1.559*** (0.200)	-1.439*** (0.180)	-1.174*** (0.124)
<i>Regulatory_Burden</i>		0.384*** (0.051)	0.396*** (0.053)	0.373*** (0.052)	0.359*** (0.050)	0.345*** (0.051)	0.331*** (0.051)
<i>Fiscal_Burden</i>			0.005 (0.008)	-0.001 (0.008)	-0.004 (0.007)	-0.005 (0.007)	-0.006 (0.007)
<i>Unemployment</i>				0.027*** (0.006)	0.026*** (0.006)	0.028*** (0.006)	0.021*** (0.007)
<i>Openness</i>					-0.004*** (0.001)	-0.004*** (0.001)	-0.003*** (0.001)
<i>Education</i>						-0.030*** (0.009)	-0.025*** (0.009)
<i>GDPpc_ppp</i>							-1.59e-05** (7.50e-06)
Constant	-2.650*** (0.387)	-1.658*** (0.291)	-1.813*** (0.417)	-1.900*** (0.401)	-1.271*** (0.407)	-0.866** (0.398)	-0.770* (0.404)
Observations	341	341	341	341	341	341	341
Number Countries	31	31	31	31	31	31	31
Time	YES	YES	YES	YES	YES	YES	YES
Chi2 of Wald Test	97.77***	224.05***	265.26***	326.21***	375.34	464.91***	455.75***

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

At this juncture, the most interesting results to emerge from Table 3 are those for the time-invariant variables that cannot enter subsequent estimations (i.e. fixed-effects and GMM). In this regard, greater experience with democracy, as measured by *Senior_Democracy*, is negatively associated with corruption (i.e. the consolidation of democracy lowers corruption).

The opposite is true of colonial history in Europe after World War II, which presents a positive association with corruption.

Greater attention needs to be given here to the variable(s) related to legal origins and administrative traditions. Table 4 presents the results for each legal origin vs. all others and also a one-to-one comparison. As hypothesized, Civil Law is positively associated with corruption, whereas Scandinavian Law is negatively related to corruption in all comparisons, presenting a highly significant coefficient. Results for the comparison made between Common Law and German Law indicate no significant difference. Note, however, that German Law appears to have a negative (decreasing) effect on corruption when compared to Civil Law, although statistical significance in this regard is weak ($p < 0.10$). Interestingly, the statistical significance of the comparison between German and French Law increases (from $p < 0.10$ to $p < 0.01$) if we shift Netherlands from Civil (as in La Porta et al., 2008) to German Law (as in Painter and Peters, 2010a, p. 22). Furthermore, the negative effect of German Law when compared to all other regimes considered together becomes (weakly) significant, ($p < 0.10$). All other results remain unchanged.

Table 4. Results comparing legal origins (from model 6 in random-effects GLS estimation)

	All three other	Civil Law	Common Law	German Law	Scandinavian Law
Civil Law	0.424*** (0.142)	-	-	-	-
Common Law	0.146 (0.249)	-0.136 (0.261)	-	-	-
German Law	-0.133 (0.168)	-0.331* (0.178)	-0.195 (0.296)	-	-
Scandinavian Law	-0.725*** (0.195)	-0.862*** (0.214)	-0.726*** (0.294)	-0.531** (0.236)	-

Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Note: Countries according to Legal Origin (La Porta, Lopez-de-Silanes and Shleifer, 2008).

Civil Law: Belgium, France, Greece, Italy, Lithuania, Luxembourg, Netherlands, Malta, Portugal, Romania, Spain.

Common Law: Cyprus, Ireland, United Kingdom.

German Law: Austria, Bulgaria, Croatia, Czech Republic, Estonia, Germany, Hungary, Latvia, Poland, Slovak Republic, Slovenia, Switzerland.

Scandinavian Law: Denmark, Finland, Iceland, Norway, Sweden.

Turning now to the fixed-effect estimations, Table 5 presents the results, which are generally more consistent than those obtained from the random estimation. As discussed, institutional and democracy-related time-invariant variables are not included here, but the variable *Years_Democracy* is. This variable is strongly significant, and the greater a country's experience with democracy, the lower the level of corruption. The results for the variables related to government intervention are the same as those obtained previously: *Regulatory Burden* is significantly and positively related to corruption, whereas *Fiscal Pressure* does not show any significant relationship with corruption.

In the case of the economic and social variables, the results present differences to those obtained for the random estimations. When *unemployment* is introduced (estimation 11), it has a significant positive association with corruption, while the opposite is the case when introducing *openness* (estimation 12), which is negatively related to corruption. However, *education* does not show a significant association with corruption (estimation 13). Moreover, when we include overall economic development (*GDPpc_ppp*, estimation 14), all the other economic and social variables lose significance, whereas the democracy-related and government intervention variables remain unchanged in all estimations. Consistent with Treisman (2007), when the author considered economic development as a driver of corruption, most of the other economic and social variables (in our case *unemployment*, *openness* and *education*) lose significance, given that they are strongly related with overall economic development. This is a clear indication of the limitations for inferring conclusions from the relationship between partial socioeconomic variables and corruption.

Table 5. Fixed-effects estimations

Variables	(8) Fixed	(9) Fixed	(10) Fixed	(11) Fixed	(12) Fixed	(13) Fixed	(14) Fixed
<i>Years_Democracy</i>	-3.170*** (0.730)	-5.189*** (0.688)	-5.227*** (0.686)	-4.915*** (0.694)	-4.645*** (0.703)	-4.680*** (0.704)	-4.812*** (0.696)
<i>Regulatory_Burden</i>		0.452*** (0.051)	0.438*** (0.051)	0.415*** (0.052)	0.414*** (0.052)	0.414*** (0.052)	0.404*** (0.051)
<i>Fiscal_Burden</i>			0.013* (0.008)	0.009 (0.008)	0.007 (0.008)	0.007 (0.008)	0.010 (0.008)
<i>Unemployment</i>				0.014** (0.006)	0.016** (0.006)	0.015** (0.006)	0.005 (0.007)
<i>Openness</i>					-0.002** (0.001)	-0.002* (0.001)	-0.001 (0.001)
<i>Education</i>						-0.012 (0.011)	-0.007 (0.011)
<i>GDPpc_ppp</i>							-2.53e-05*** (8.70e-06)
Constant	0.704 (1.143)	5.350*** (1.142)	4.285*** (1.180)	4.332*** (1.190)	4.273*** (1.184)	4.557*** (1.211)	5.515*** (1.241)
Observations	341	341	341	341	341	341	341
Number of Countries	31	31	31	31	31	31	31
Time	YES						
R-squared within	0.182	0.355	0.361	0.373	0.381	0.384	0.401
R-squared between	0.633	0.766	0.750	0.764	0.764	0.786	0.799
R-squared overall	0.610	0.745	0.730	0.744	0.745	0.766	0.778
F	6.05***	13.65***	12.90***	12.57***	12.12***	11.44***	11.54***

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Finally, Table 6 shows the results from the GMM estimations when including a lagged dependent variable. Note that Arellano-Bond tests for AR(2) and AR(3), as well as the Hansen tests for overidentifying restrictions, always yield $p > 0.10$, suggesting that endogeneity is not a relevant concern. In this final set of estimations, *Years_Democracy* and *Regulatory_Burden* present the same results as in the previous estimations. In the case of *Fiscal_Burden*, a few estimations show a weakly significant positive association with corruption. This would suggest a weak direct association between changes in fiscal burden and corruption. However, the relationship is not significant in any of the other estimations, including the most complete, preferred estimation (21).

Table 6. Results from GMM estimations

Variables	(15) Difference GMM	(16) Difference GMM	(17) Difference GMM	(18) Difference GMM	(19) Difference GMM	(20) Difference GMM	(21) Difference GMM
<i>Corruption_index_t-1</i>	-0.275 (0.208)	-0.246 (0.183)	-0.304* (0.176)	-0.344* (0.187)	-0.305* (0.184)	-0.333* (0.182)	-0.374* (0.201)
<i>Years_Democracy</i>	-13.651*** (5.222)	-12.899*** (4.321)	-13.878*** (4.620)	-13.399*** (4.667)	-12.925*** (4.472)	-13.562*** (4.902)	-13.284*** (4.953)
<i>Regulatory_Burden</i>		0.264*** (0.070)	0.270*** (0.073)	0.273*** (0.074)	0.277*** (0.073)	0.260*** (0.071)	0.263*** (0.073)
<i>Fiscal_Burden</i>			0.014** (0.007)	0.012* (0.007)	0.010* (0.006)	0.011* (0.006)	0.010 (0.007)
<i>Unemployment</i>				0.009 (0.007)	0.011 (0.007)	0.009 (0.007)	0.008 (0.007)
<i>Openness</i>					-0.003** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)
<i>Education</i>						-0.043*** (0.017)	-0.044*** (0.017)
<i>GDPpc_ppp</i>							-7.51e-06 (1.04e-05)
Time	YES						
# Instruments	18	19	20	21	322	23	24
# Observations	310	310	310	310	310	310	310
# Country	31	31	31	31	31	31	31
Chi2 of Wald Test	296.08***	261.61***	279.05***	294.29***	264.08***	365.16***	353.50***
AR (1)	2.48**	2.43**	2.69***	2.75***	2.60***	2.66***	2.56**
AR (2)	1.44	1.11	1.30	1.03	1.11	1.12	1.10
AR (3)	1.19	1.29	1.28	1.10	1.21	1.18	1.08
Hansen Test p-value	0.453	0.560	0.646	0.675	0.665	0.685	0.704

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Unlike in the fixed-effect estimations, the introduction of economic development in the most complete estimation (21) shows a lack of association with changes in the dependent variable. Furthermore, while *unemployment* lacks significance throughout the estimations, *openness* and *education* present the expected result, which can be understood as a significant negative relationship between changes in *openness* and *education* and changes in corruption.

Discussion and policy implications

Differences in the perception of corruption across the countries of Europe are marked and persistent over time. This study has contributed to the literature by providing an explanation of the main factors accounting for these divergences in a sample made up of the 28 EU and three EFTA countries between 2007 and 2017. Greater experience of democracy is negatively related to corruption, while the civil law administrative tradition presents a positive association. These results are consistent and significant across all models and estimations. Openness and education tend to be negatively associated with corruption, but their association with a country's overall economic development places some limitations on these findings.

The core hypothesis in this study is that corruption is most dependent on the style of government intervention in the economy. Indeed, while fiscal intervention does not appear to have a significant influence on corruption, regulatory intervention and the burden associated with excessive red tape show a strong and consistent direct association across all models and estimations. This is a relevant finding and suggests a fruitful path for interpreting differences between European countries and their subsequent policy implications.

Northern European countries tend to give priority to fiscal intervention and adopt a more flexible approach to regulatory intervention and bureaucratic procedures. In contrast, Eastern and particularly Southern European countries tend to give greater priority to intervention by means of regulation and bureaucratic procedures. This is consistent with the fact that the Scandinavian, and to some extent the German, administrative and legal traditions present a negative association with corruption, while the opposite is the case of the Civil Law tradition. This, together with differences in democratic experience, contribute greatly to explaining differences in the perception of corruption across European countries and their persistence.

Policy implications directly emerge from this research. If regulatory intervention and bureaucratic proceduralism and discretion –that is, drowning the system in red tape– favour corruption, reducing over-regulation and eliminating red tape that imposes unjustified and excessive compliance burden could help to improve transparency and cut down on the amount of corruption.

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Appendix.

Table A1 Correlation matrix

	<i>Civil Law</i>	<i>Com Law</i>	<i>Germ Law</i>	<i>Sand Law</i>	<i>Colon</i>	<i>Senior Demo</i>	<i>Year Demo</i>	<i>Reg Burden</i>	<i>Fiscal Burden</i>	<i>Unemp</i>	<i>Open</i>	<i>Educa</i>	<i>GDPpc _ppp</i>
<i>Civil_Law</i>	1.000												
<i>Common_Law</i>	-0.243	1.000											
<i>German_Law</i>	-0.589	-0.260	1.000										
<i>Scandinavian_Law</i>	-0.325	-0.143	-0.348	1.000									
<i>Colonial_History</i>	0.080	0.358	-0.209	-0.115	1.000								
<i>Senior_Democracy</i>	0.268	0.243	-0.656	0.325	0.195	1.000							
<i>Years_Democracy</i>	0.135	0.241	-0.572	0.389	0.174	0.925	1.000						
<i>Regulatory_Burden</i>	0.337	-0.210	0.133	-0.445	-0.110	-0.332	-0.412	1.000					
<i>Fiscal_Burden</i>	-0.020	-0.317	-0.218	0.569	-0.160	0.396	0.443	0.002	1.000				
<i>Unemployment</i>	0.223	0.022	-0.041	-0.254	-0.038	-0.110	-0.293	0.408	-0.144	1.000			
<i>Openness</i>	0.148	0.007	0.025	-0.231	0.325	-0.065	0.048	-0.184	-0.212	-0.184	1.000		
<i>Education</i>	-0.153	0.408	-0.347	0.331	-0.001	0.423	0.501	-0.620	0.139	-0.051	0.088	1.000	
<i>GDPpc_ppp</i>	0.063	0.091	-0.334	0.288	-0.086	0.626	0.716	-0.516	0.294	-0.401	0.402	0.544	1.000

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A large, decorative graphic element consisting of a series of thin, parallel lines that form a semi-circular shape, filling the lower half of the page. The lines are light blue and create a textured, wave-like effect.