

“Explaining the causes of cross-country differences in corruption”

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Introduction

Since the acknowledgment of the detrimental nature of corruption, the phenomenon got a prominent place on the global agenda. Governments, international organizations and scientists all paid attention to the causes, cures and consequences of corruption. By lowering investment, causing the misallocation of government spending, encouraging protectionism, increasing inequality, and damaging government legitimacy, corruption is very harmful for societies¹. Some even believe corruption to be the primary cause of underdevelopment. Corruption levels around the world however are still seen as increasing over the past three years, with the biggest increases in the wealthier continents of North America and Europe (global corruption barometer 2010).

One of the most common definitions of corruption is the “misuse of public office for private gain”. It affects, although at different degrees, all societies at all times. Considering all the negative effects of corruption, this paper tries to add to the literature by providing a greater understanding of the causes of corrupt activities. Using cross-country data covering a wide set of nations, I examine the role of economical, political, and cultural factors on corruption and explain why corruption is more widespread in some countries than others.

The next section will give an overview of the related literature and gives explanations for the chosen determinants of corruption I examine. The effect of the economic factors; economic development, globalization, inflation, and the availability of natural resources on corruption are reviewed. I also evaluate how democracy, press freedom, population size, government intervention, and Internet and e-government are believed to influence corruption. Finally common thoughts on the relationship between corruption and colonial and legal origin, religion and cultural values are revised.

Chapter three explains the use of the data sources and my methodological strategy. As dependent variable I will use a commonly used indicator of perceived corruption, namely the Corruption Perception Index. In my regressions, first the most plausible exogenous variables are included, followed by variables more open to change. The variables found to significantly effect perceived corruption are economic development, share of Protestants in the population, endowment of natural resources, a long history of democracy, press

¹ For examples see Mauro (1995), Lambsdorff (2005), and Aidt (2009)

freedom, government regulation, e-government and in weaker form the adaptation of internet and masculinity. Economic development, a large share of protestants, a long history of democracy, a free press and the adaptation of Internet and e-government all decrease corruption. Large endowments of natural resources, a lot of government intervention and a masculine society have an increasing effect on corruption.

Literature overview

By investigating the causes of corruption, and determining country specific characteristics that explain differences in corruption levels, a part of the scholarly literature has pointed out the correlation between a large set of variables and corruption. Most studies however, have had their focus more on single issues rather than covering a wide set of explanatory variables. Although these studies add valuable contributions to the literature, a problem with this methodology is omitted variables bias in their multiple regressions. The literature that does focus on explaining all the variation in corruption across countries often takes the government official as a starting point. These studies look at the economical, political, historical, and cultural characteristics of a country and analyse how this characteristics influence the government official in weighing the expected costs and benefits of the corrupt act (Treisman; 2000, Bohara et al.; 2004, Pellegrini and Gerlagh; 2008 and Goel and Nelson; 2010). Based on this approach in combination with existing theories, I will carry out an empirical investigation on the causes of perceived corruption where all the different factors will be jointly analyzed.

The one finding that is most consistent and often extremely robust is that economic development is very closely correlated with lower perceived corruption. As Treisman (2000) points out, economic development influences the government official's decision whether to perform a corrupt act or not by increasing the spread of education, literacy, and depersonalized relationships — each of which should raise the odds that an abuse will be noticed and challenged. The expected costs for the official are hereby directly increased. Pellegrini and Gerlagh (2008) add that richer countries also can afford better institutions, which makes the opportunities for officials to seek rent more difficult. Looking at the benefits for the bribe-taker, Sandholtz and Koetzle (2000), note that in poor

countries the marginal value of money is higher than it is in wealthy countries, so public officials are more likely to accept or demand a bribe in underdeveloped countries. Treisman (2007) also attempts to find the direction of causation. Does economic development reduce corruption or is a decrease in corruption in turn beneficial for economic development? He assumes that laboriously reconstructed historical GDP data affect current corruption perceptions only via the effect on subsequent economic development and finds strong support for the hypothesis that higher development does cause lower perceived corruption.

Secondly, it is widely believed that corruption is related to the deficiencies of the political system and that an established democracy, by promoting political competition, and hence increasing transparency and accountability, can provide a check, albeit an imperfect one, on corruption (Dreher, Kotsogiannis and McCorriston; 2007). Important to note is that most authors find a nonlinear relationship, where not democracy per se, but a longer history of democracy has a positive effect on perceived corruption. For example Montinola and Jackman (2002) and Sung (2004) find that countries, which are in transition from authoritarianism to democracy, are most corrupt in cross-country empirical studies. Sandholtz and Koetzle (2000) propose an institutional and normative argument. Next to more, and more effective means of detecting and punishing corruption in a democracy, in established democracies normative orientations are widely shared. Implying that due to a longer history of democracy, democratic norms have diffused both more extensively and more intensively. Treisman (2000, 2007) empirically supports their findings. Donchev and Ujhelyi (2008), using a dummy variable for uninterrupted democracy between 1950-1995, (same approach as Treisman; 2000 and 2007) however find that democracy is not always a insignificant determinant of actual corruption experience.

Nevertheless, the benefits of a democracy partly depend on the existence of a free and effective press functioning as a supervisory body, which may decrease the expected utility of corruption. This is because a free press gives greater transparency and is able to expose graft and deter the misuse of public offices (Rose-Ackerman; 1999 and Shleifer and Vishny; 1993). Brunetti and Weder (2003) get statistically significant results when regressing several perceived corruption indicators on an index of free press by Freedom House.

Adserà, Boix, and Payne (2003) find the same result using free circulation of daily newspapers per person as dependent variable. But some more recent studies show different results. Lederman et al. (2005) analyze the relationship between several political institutions and perceived corruption. The coefficient on press freedom becomes insignificant when they include a control variable of economic development in the regression. Also Treisman (2007) notes that a variable for press freedom was quite—but not universally—robust to the inclusion of controls.

The degree of openness to trade of a country is another widely debated explanation for differences in perceived corruption across nations. The reasoning behind this is that through international trade, national companies have increased competition, which in turn shrinks their profits available for corruption. Confirming this, Treisman (2007) finds that countries with a long history of foreign trade have significantly lower perceived and experienced corruption. Lessman and Markwardt (2009) and Pelligrini and Gerlagh (2008) however, have insignificant results in their regression in regard to trade openness and explain this as a result of excluding smaller countries with a favourable investment climate. In addition, it can also be argued that countries wishing to participate in the world economy experience pressure from, among others, supranational organizations to become more accountable and transparent (Sung and Chu; 2003). In this study we do not focus on the openness of the domestic economy alone but extend the research to the broader term globalization. This is because integration in the world economy does not exclusively happen through trade, and globalization has a big effect on domestic competition.

Another set of theories relates part of a country's history to present day levels of corruption. Both a country's colonial origin and legal origin influence the strength and efficiency of a country's legal system. Since legal systems can be viewed as indicators of the relative power of the state vis-à-vis property owners, different systems developed differently over time in defence of Parliament and property owners against the attempts by the sovereign to regulate and expropriate them (La Porta et al.; 1999). Goel and Nelson (2010) note that potential bribe-takers and bribe-givers are relatively certain of the costs of corrupt acts when the legal framework is well defined and consistent. They find

that countries using the English Common Law System, other things being equal, have lower perceived corruption and countries with a Socialist, French and German system higher perceived corruption. Often colonial and legal origins are used as control variables (e.g. Treisman; 2007 and Adserà, Boix, and Payne; 2003). But empirical results are ambiguous. Graeff and Mehlkop (2003) and Pellegrini and Gerlagh (2008) mostly find an insignificant relationship between legal structure and perceived corruption. Treisman (2000) explains that one might expect countries with different colonial traditions to have different legal cultures — and different degrees of susceptibility to corruption — irrespective of whether they have common law or civil law systems. So not per se the legal system but more the legal culture explains the variance. His empirical results support this hypothesis.

The impact of a relative big and highly interventionist government on corruption is in theory straightforward. By increasing the extent of public power, the opportunities to misuse this power also increase. Obviously, there are no opportunities for corruption if there is no rule making (Bardhan, 1997). However, cross sectional analysis shows different results. For example Adserà, Boix, and Payne (2003) and Fisman and Gatti (2002) report that a bigger government, measured by the size of the government budget relative to GDP, has decreasing levels of perceived corruption. Bohara et al. (2004) and Pellegrini and Gerlagh (2008) have insignificant results when studying the hypothesis that government intervention is associated with perceived corruption. And, using a comprehensive measure of government intervention, Goel and Nelson (2010) find that greater regulatory activity in the public arena is a breeding ground for perceived corruption. They add that it is not a large public sector, per se, that contributes to corrupt activity because larger governments may well be involved in greater spending on law enforcement, education and health and on implementing checks and balances to deter such activity.

Inflation is also used in explaining cross-country differences in corruption. Lambsdorff, Braun and Di Tella (2000) suggest that inflation tends to go along with a higher price variation. This increases the costs of auditing agents, suggesting that moderate levels of agent's corruption will be condoned. Braun and Di Tella (2004) support this idea and document a positive relationship between perceived corruption and inflation variability in a sample of 75

countries. Paldam (2002) explains the relationship between corruption and inflation via 'public morale'. He links inflation with economic chaos and argues that economic chaos causes people to lose faith in authorities causing corruption to increase. Until the inclusion of cultural dummies, the positive relationship between perceived corruption and inflation is fairly robust. Goel and Nelson (2005) add that a higher inflation rate is likely to increase solicitation of bribes by government officials, as government salaries are unable to keep up with rising prices and officials look for other means to supplement their earnings. Their empirical results support the hypothesis that countries with low inflation rates tend to experience less perceived corruption activity.

Since increased openness and availability of information enable the public to make informed political decisions and improve the accountability of governments (Vishwanath and Kaufmann; 1999), recent studies have focused on the relationship between e-government and corruption. E-government not only reduces contact between corrupt officials and citizens, opens up government processes and enables greater public access to information, but the very process of building an on-line delivery system requires that rules and procedures are standardized across regions and made explicit (amenable for computer coding). This reduces the discretion and opportunity for arbitrary action available to the civil servants in dealing with every applicant on a case by case basis (Bhatnagar; 2003). Along with several case studies of e-government applications from developing countries that report some impact on reducing corruption, Shim and Eon (2008) find that e-government has a consistently positive impact on reducing perceived corruption. Their use of control variables however is rather limited. It is reasonable to assume that e-government goes hand in hand with the use of Internet. Without an Internet connection, e-government is of no use. In addition the Internet on itself is a major source of information and increases transparency. Following Lio et al. (2011) and Andersen et al. (2009) I will research not only the effect of e-government but also of Internet on corruption. Andersen et al. (2009) use lightning density as an indicator for Internet diffusion and show that Internet diffusion has reduced the extent of corruption, measured as the difference between perceived corruption between 1996 and 2006, across countries.

Next to the already discussed cultural phenomena of colonial and legal origin, there are additional cultural aspects that could contribute to increased corruption. Paldam (2002) explains that corruption follows the main cultural divisions and proposes that it can be so deeply rooted in certain cultures that it could be unchangeable. He classifies countries into main cultural groups but his regression results show that countries are more similar in GDP level than in the level of corruption within the same cultural area and concludes that culture is an inferior explanation of the level of corruption. Husted (1999) uses a dataset based on a set of cultural values identified by Hofstede (1997). His results, mostly using only GNP per capita as a control variable, show that “power distance, “uncertainty avoidance” and “masculinity” all increased perceived corruption. Other authors (La Porta et al.; 1997 and 1999 and Treisman; 2000) link the religious part of cultures to corruption. Especially Catholic, Eastern Orthodox and the Muslim religion with their hierarchical nature are supposed to have fewer challenges to the status quo. The relationship produced by La Porta et al. (1999), however becomes rather weak as soon economic development is controlled for. Treisman (2000) on the other hand does find a strong association between religion and perceived corruption. Also Serra (2006), using global sensitivity analysis, finds that the Protestant religion significantly lowers perceived corruption.

Large endowments of valuable raw materials also appear in cross-country studies of corruption. Availability of natural resources potentially offers opportunities for rent-seeking. Ades and Di Tella (1999) argue that corruption tends to be greater where there are larger economic rents available for bureaucrats to capture. Corruption may offer greater gain to officials who exercise control over the distribution of the rights to exploit these natural resources. Leite and Weidmann (1999) and Adsera et al. (2003) show that perceived corruption levels are associated with natural resources endowments. Reported corruption experiences are also possibly effected by the dependence on fuel exports (Treisman; 2007).

Some authors studied the relationship between corruption and country size. Among others, Treisman (1999) and Fisman and Gatti (2002) report a positive correlation between population and corruption. Country's size, measured by population, might be an indicator for the effectiveness to monitor

government officials, especially politicians, and the establishment of decent institutions and administration. Testa (2010) and Lessman and Markwardt (2009) use population size as control variable. Testa finds a positive significant relationship between population and corruption using a dataset of 35 countries. Lessman and Markwardt on the other hand fail to find a significant relationship.

Data and Methodology

In the previous section I identified 14 variables which can have a possible effect on corruption. Economic development, democracy, press freedom, globalization, colonial origin, legal origin, government intervention, inflation, the Internet, cultural values, religion, natural resource abundance, population size, and e-government will all be tested as a possible contributor for differences in perceived corruption across nations. The full definitions of variables and the sources of the data are reported in appendix. The data for the dependent variable, corruption, comes from Transparency International. I use a measure of perceived corruption, namely the Corruption Perceptions Index (CPI) as a proxy for corruption.

The Corruption Perceptions Index ranks countries according to the perception of corruption in the public sector. Scores are given on a scale from 10 (very clean) to 0 (highly corrupt). The 2010 version of the CPI is based on 13 independent surveys. Broadly speaking, the surveys and assessments used to compile the index include questions relating to bribery of public officials, kickbacks in public procurement, embezzlement of public funds, and questions that probe the strength and effectiveness of public sector anti-corruption efforts². Not all surveys are however included in all countries. In 2010, Denmark, New Zealand and Singapore are the top scoring countries with a score of 9.3. At the bottom of the ranking, Somalia with a score of 1.1, and Myanmar and Afghanistan at 1.4 have the worst scores. Due to its methodology, the CPI cannot be used for trend analysis or for monitoring changes in the perceived levels of corruption over time for all countries. So for robustness purposes I will perform my regressions with both the CPI from 2010 and 2009. The corruption index number was transformed by subtracting it from 10 so that the scale is increasing rather than decreasing.

² 2011 Corruption Perception Index

A valuable question about validity arises since the data do not measure corruption itself, but rather perceived levels. It is possible that these opinions are based on false information or are simply incorrect. Donchev and Ujhelyi (2008) for example show that actual corruption experience is a weak predictor of corruption perception. Perceptions might be wrongfully formed by the media or shaped by circumstances, which in theory may cause corruption. On the other hand, the simple correlation between frequently used perceived correlation rankings often rises above 0.9 (Treisman 2007), indicating that different methodologies from different countries and cultures generate very comparable scores.

A large amount of the explanatory variables are from Treisman (2007): dummy variables for long term democracies, colonial and legal origin and percentages of people in a nation following specific religions. The dummy variables for colonial origin indicates whether a country has been under French, Brittan, Spanish or Portuguese, or any other state other than the previously named nations control. Another classification using dummy variables is that of legal origin. Dummies are used for British common law, Socialist/Communist legal origin or other legal origins. In addition the percentage of population being Catholic, Protestant, Muslim or any other religion than Catholic, Protestant and Muslim is used as an explanatory variable. The final measure coming from Treisman is a dummy variable for long-term democratic countries. I updated his data and all countries, which are democracies since 1970, are classified as long term democracy in the democracy dummy.

Because of the mixed result in previous academic work about the connection between democracy and corruption I use an additional parameter of democracy. The Freedom House Freedom in the World report annually measures political rights and civil liberties, or the opportunity for individuals to act spontaneously in a variety of fields outside the control of the government and other centres of potential domination³. Scores and ratings for each country are given by country or regional experts and range from 1 to 7; a rating of 1 indicates the highest degree of freedom and 7 the least amount of freedom. Another measure of Freedom House I use is Freedom of the Press. According to Freedom House's 2010 Freedom of the Press index, press freedom is now in decline in

³ 2011 Freedom house Freedom in the World report

almost every part of the world. Only 17 percent of the world's citizens live in countries that enjoy a free press. The index assesses the degree of print, broadcast, and Internet freedom in every country in the world. Scores are given from 0 to 100 where 0 means the most freedom for the press.

Economic development is measured through 2009 PPP GDP per capita, in constant 2005 international dollar (World Bank World Development Indicators 2011). I use the 2008 KOF index of globalization as a proxy for globalization. The index Ranges from 1 to 100 where higher values indicate a greater degree of globalization. The overall index covers the economic, social and political dimensions of globalization. Globalization is defined to be the process of creating networks of connections among actors at multi-continental distances, mediated through a variety of flows including people, information and ideas, capital and goods. Government intervention is constructed using three pillars of the 2011 index of economic freedom from The Heritage Foundation and The Wall Street Journal. I took the average of the Business Freedom, Government Spending and Monetary Freedom pillars. Countries have scores between 0 and 100 where 0 means maximal government intervention. I use two measures for inflation. From the IMF World Economic Outlook I took the average of the absolute value of the per cent change in average consumer prices in 2008/2009/2010. Since it is argued that not inflation, but inflation variance (e.g. by Braun and Di Tella 2004) can be a better alternative in its effect on corruption, I also use the logarithm of the variance of the absolute value of the per cent change in average consumer prices in 2008/2009/2010 as a variable. The number of Internet users per 100 inhabitants in 2008 comes from the ITU World Telecommunication/ICT Indicators Database. The 2011 CIA World Factbook gives an estimate for a nations population size. This is done through the US Bureau of the Census and based on statistics from population censuses, vital statistics registration systems, or sample surveys pertaining to the recent past and on assumptions about future trends.

As previously mentioned, the cultural values of Hofstede (1997) might explain corruption variance between countries. He classifies countries according to 5 cultural dimensions. Power Distance Index is the extent to which the less powerful members of organizations and institutions (like the family) accept and expect that power is distributed unequally. Individualism on the one side versus

its opposite, collectivism is the degree to which individuals are integrated into groups. Masculinity refers to the distribution of roles between the genders. Men's values contain a very assertive and competitive dimension, which is maximally different from women's values, which are modest and caring. The Uncertainty Avoidance Index deals with a society's tolerance for uncertainty and ambiguity; it ultimately refers to man's search for truth. Not all the countries in my sample are scored according to Hofstede's dimensions. For only 76 countries data is available on Power Distance, Individualism, Masculinity and Uncertainty Avoidance.

Total natural resources rents as a percentage of GDP in 2009 is also added in the dataset. This data is collected from the World Bank World Development Indicators. The United Nations e-government development index is used to measure e-government. The index focuses on the use of the Internet to facilitate provision of information by governments to citizens, interaction with stakeholders and engagement in decision-making processes. In the chosen year 2010, South Korea was the only country with a perfect score of 1. Along the least scoring countries with a score of 0.01 were Nigeria, Senegal and Algeria.

Since the dependent variable is a continuous variable, regressions via the ordinary least squares method is the appropriate way to continue. I will follow Treisman (2000) by first including more stable and historical variables and subsequently include variables which are more likely to change over time. In addition the cultural variables from Hofstede are added last since these datasets are only available for a low number of countries. Since my dataset contains a lot of variables, there is a risk of Multicollinearity. Due to this, some variables might not have enough variation to be clearly distinguished. On the other hand, positive results are more robust and deserve more attention than negative results. Another possible criticism is the direction of causality. Where possible, I will follow previous work in addressing this issue. Further, White's (1980) general test for heteroscedasticity provides evidence that the residuals are homoscedastic.

Table 1: summary statistics

variable	N	Mean	Std. Dev.	Min	Max	variable	N	Mean	Std. Dev.	Min	Max
CPI_2010	174	5.98	2.10	0.7	8.9	GOV_REG	166	67.74	10.33	10.7	91.92
CPI_2009	174	5.99	2.10	0.6	8.9	INFL	169	7.09	5.09	1.18	30.14
GDP	163	12166	14271	290	82978	INFL_VAR	169	0.83	0.83	0.02	(3.64)
DEMO	169	3.45	1.94	1	7	INTERNET	171	27.43	26.75	0.22	91.04
ALLDEM	167	0.17	0.37	0	1	PDI	76	61.54	21.21	11	104
PRESS	170	49.26	23.56	10	95	IDV	76	41.25	23.1	6	91
GLOB	169	58.01	17.04	22.72	92.6	MAS	76	50.36	17.7	5	110
NONCOL	174	0.14	0.35	0	1	UAI	76	64.82	22.18	8	112
BRITCOL	174	0.30	0.46	0	1	CATH	169	29.99	35.54	0	97.3
FRCOL	174	0.14	0.35	0	1	PROT	169	11.8	20.65	0	97.8
SPPORC	174	0.17	0.38	0	1	MUSL	169	25.36	36.90	0	99.9
OTHC	174	0.24	0.43	0	1	NO_REL	169	32.83	32.20	0	100
LEG_BR	165	0.30	0.46	0	1	NAT_RES	168	8.22	13.15	0	68.63
LEG_FR	165	0.52	0.5	0	1	E_GOV	158	0.22	0.22	0.01	1
LEG_SOC	165	0.17	0.38	0	1	POP	174	3.9E7	1.4E8	72969	1.3E9

Results

In this section I perform an empirical investigation on the causes of corruption, analysing all the above-mentioned factors in a joint analysis. The first variables I include are GDP, dummy variables for colonial history and legal origin and a measure for natural resource endowment. Because of their historical nature (except for GDP), this set of explanatory variables can be considered fixed over long time scales. As dependent variables I use the 2010 and 2009 Corruption Perceptions Index. It should be noted that the dependent variable, the corruption index, is rescaled so that a higher number means more corruption. Results are reported in tables 2 till 7. In accordance with almost all previous work, GDP significantly reduces perceived corruption. The variable is extremely robust and survives the inclusion of all control variables. Questions about causality naturally come to mind because a lack of corruption can also foster growth. Treisman (2007) uses laboriously reconstructed historical GDP data and finds strong support for the hypothesis that higher development does cause lower perceived corruption. A debated issue in the literature is whether legal origin or colonial history has a stronger effect on corruption. In addition both are often used as control variables. Following Graeff and Mehlkop (2003) I do not find any support that a history of British law, whether through the legal system or legal culture lowers perceived corruption in table 2. Also other historical determinants specifying legal or colonial origin do not significantly increase or decrease perceived corruption.

Table 2: OLS regressions

T-statistics are in parenthesis next to the coefficients. ^{A, B, C} Correspond to a 10, 5, 1% of significance, respectively

	(1) CPI_2010	(2) CPI_2009
CONSTANT	7.066 ^C (19.327)	7.056 ^C (19.265)
GDP	-0.742 ^C (-15.321)	-0.741 ^C (-15.296)
NONCOL	-0.073 (-1.215)	-0.074 (-1.235)
BRITCOL	0.044 (0.539)	-0.048 (0.645)
FRCOL	0.037 (0.528)	0.035 (0.499)
SPPORC	0.032 (0.440)	0.04 (0.551)
OTHC	-0.071 (-0.932)	-0.055 (-0.721)
LEG_BR	-0.083 (-1.180)	-0.078 (-1.109)
LEG_OTH	-0.117 (0.786)	-0.121 (-1.006)
LEG_SOC	0.110 ^A (1.863)	0.093 (1.574)
NAT_RES	0.263 ^C (5.988)	0.271 ^C (6.180)
Number of cases	155	155
Adj. R2	0.708	0.708

The percentage of total natural resources rents, measuring the degree of natural resource endowment, is highly robust. It survives the inclusion of different control variables, which is in accordance with Leite and Weidmann (1999) and Adsera et al. (2003). On average an increase of a one standard deviation (13.48%) in the percentage of resource rents, the perceived corruption score will increase by 0.3. Adding to robustness, the results for both years of the CPI almost show identical results, not only in this, but in all regressions. Table 3 shows the effect of religion and populations size on corruption. Regarding religion, my results are similar to Treisman (2000) and Serra (2006): the amount of Protestants in a country reduces perceived corruption. In comparison with the hierarchical nature of other religions, challenges to the status quo are not uncommon in the Protestant religion. The signs of Catholics and Muslims do have the expected direction but are insignificant. The percentage of protestants in a country remains highly significant and robust throughout all regressions until the inclusion of other cultural values. This however, does not necessary explains something about the role of current levels of religion and corruption. The data are from the 1980's, so they possibly explain rooted cultural norms instead of current believes.

Table 3: OLS regressions

T-statistics are in parenthesis next to the coefficients. ^{A, B, C} Correspond to a 10, 5, 1% of significance, respectively

	(1) CPI_2010	(2) CPI_2009
CONSTANT	7.278 ^c (35.684)	7.303 ^c (35.667)
GDP	-0.746 ^c (-18.277)	-0.743 ^c (-18.204)
NAT_RES	0.237 ^c (5.673)	0.246 ^c (5.875)
CATH	0.18 (0.799)	0.23 (0.356)
PROT	-0.214 ^c (-4.848)	-0.216 ^c (-4.897)
MUSL	0.032 (0.679)	0.032 (0.666)
NO_REL	-0.006 (-0.142)	-0.012 (-0.281)
POP	0.002 (0.054)	-0.006 (-0.156)
N	159	159
Adj. R2	0.776	0.756

Population size on the other hand has no explanatory value. Country's size does not contribute to be an indicator for the effectiveness to monitor government officials.

The effect of different measures of democracy and press freedom are investigated through regressions (1)-(6) in table 4. Both democracy, as measured by Freedom House, and press freedom, also measured by freedom house seem to have a positive significant effect on perceived corruption. But when included together in the regression, both become insignificant. A possibility could be that this is due to multicollinearity. The two have a correlation of 0.927 and are also measured by the same institute. If I exclude simultaneously Press and DEMO, the fit, however, remains mostly the same. At the same time a proposed dummy variable for countries with a long history of democracy (Treisman; 2000) remains significant throughout the inclusion of both PRESS and DEMO. Therefore my results follow several others, including Montinola and Jackman (2002) and Sung (2004) in that it is not democracy per se, but rather established norms and institutions within a longer history of democracy that lower perceived corruption. The dummy variable I used measures countries being a democracy for 40 years or longer. Also a free press significantly lowers corruption. Except for the Freedom House measure of democracy, it survives the inclusion of a large number of control variables.

Table 4: OLS regressions

T-statistics are in parenthesis next to the coefficients. ^{A, B, C} Correspond to a 10, 5, 1% of significance, respectively

	(1)	(2)	(3)	(4)	(5)	(6)
	CPI_2010	CPI_2009	CPI_2010	CPI_2009	CPI_2010	CPI_2009
CONSTANT	6.455 ^c (27.901)	6.419 ^c (28.249)	6.346 ^c (22.393)	6.317 ^c (22.691)	6.271 ^c (22.345)	6.236 ^c (22.582)
GDP	-0.606 ^c (-14.237)	-0.596 ^c (-14.300)	-0.604 ^c (-14.129)	-0.594 ^c (-14.1919)	-0.610 ^c (-14.267)	-0.601 ^c (-14.320)
NAT_RES	0.111 ^c (2.634)	0.115 ^c (2.798)	0.114 ^c (2.689)	0.118 ^c (2.848)	0.136 ^c (3.408)	0.142 ^c (3.625)
PROT	-0.131 ^c (-3.314)	-0.125 ^c (-3.232)	-0.119 ^c (-2.752)	-0.114 ^c (-2.689)	-0.100 ^B (-2.394)	-0.093 ^B (-2.280)
DEMO	0.221 ^c (4.542)	0.229 ^c (4.808)	0.16 (1.563)	0.172 ^A (1.714)		
ALLDEM	-0.156 ^c (-3.440)	-0.168 ^c (-3.769)	-0.154 ^c (-3.367)	-0.165 ^c (-3.697)	-0.156 ^c (-3.396)	-0.167 ^c (-3.722)
PRESS			0.07 (0.504)	0.066 (0.640)	0.214 ^c (4.287)	0.221 ^c (4.497)
N	154	154	154	154	154	154
Adj. R2	0.81	0.818	0.81	0.817	0.808	0.815

Next to the already robust effect of variables such as GDP, NAT_RES, PROT, PRESS, and ALLDEM, table 5 and 6 analyse the effect of globalization, inflation and the degree of government intervention on perceived corruption. Globalization is highly significant and lowers perceived corruption till the inclusion of Internet and e-government. It has a strong effect on perceived corruption through its average Beta of 0.2. Lessman and Markwardt (2009) and Pelligrini and Gerlagh (2008) have insignificant results in their regression when they link openness to trade with the availability of rents. One could argue that authors that previously found a significant relationship between openness to trade and corruption were not capturing the effect of additional rents but rather the effect that trade and/or globalization has on countries wishing to participate in the world economy. Sung and Chu (2003) describe that through participation, countries experience pressure from, among others, supranational organizations to become more accountable and transparent.

Table 5: OLS regressions

T-statistics are in parenthesis next to the coefficients. ^{A, B, C} Correspond to a 10, 5, 1% of significance, respectively

	(1) CPI_2010	(2) CPI_2009	(3) CPI_2010	(4) CPI_2009
CONSTANT	7.835 ^c (14.225)	8.067 ^c (15.369)	7.858 ^c (13.881)	8.112 ^c (15.025)
GDP	-0.601 ^c (-9.196)	-0.453 ^c (-8.951)	-0.488 ^c (-9.136)	-0.451 ^c (-8.886)
NAT_RES	0.089 ^B (2.098)	0.090 ^B (2.223)	0.104 ^B (2.549)	0.104 ^c (2.679)
PROT	-0.167 ^c (-4.204)	-0.169 ^c (-4.462)	-0.150 ^c (-3.488)	-0.154 ^c (-3.770)
DEMO	0.127 ^B (2.362)	0.115 ^B (2.248)		
ALLDEM	-0.138 ^c (-3.077)	-0.145 ^c (-3.405)	-0.137 ^c (-3.032)	-0.145 ^c (-3.367)
GLOB	-0.190 ^c (-3.140)	-0.230 ^c (-3.998)	-0.203 ^c (-3.437)	-0.243 ^c (-4.322)
PRESS			0.118 ^B (2.168)	0.104 ^B (2.000)
INFL_VAR				
INFL	0.063 (1.574)	0.082 ^B (2.185)	0.056 (1.402)	0.077 ^B (2.021)
GOV_REG				
N	150	150	150	150
Adj. R2	0.823	0.840	0.822	0.839

Table 6: OLS regressions

T-statistics are in parenthesis next to the coefficients. ^{A, B, C} Correspond to a 10, 5, 1% of significance, respectively

	(1) CPI_2010	(2) CPI_2009	(3) CPI_2010	(4) CPI_2009
CONSTANT	9.423 ^C (12.290)	9.803 ^C (13.376)	9.372 ^C (11.950)	9.753 ^C (13.012)
GDP	-0.489 ^C (-9.207)	-0.455 ^C (-8.980)	-0.485 ^C (-9.097)	-0.451 ^C (-8.873)
NAT_RES	0.088 ^B (2.075)	0.090 ^B (2.204)	0.100 ^B (2.424)	0.101 ^B (2.552)
PROT	-0.169 ^C (-4.276)	-0.169 ^C (-4.490)	-0.150 ^C (-3.547)	-0.151 ^C (-3.752)
DEMO	0.137 ^B (2.558)	0.129 ^B (2.522)		
ALLDEM	-0.123 ^C (-2.726)	-0.130 ^C (-3.016)	-0.123 ^C (-2.709)	-0.130 ^C (-2.998)
GLOB	-0.179 ^C (-3.011)	-0.223 ^C (-3.920)	-0.192 ^C (-3.281)	-0.235 ^C (-4.204)
PRESS			0.129 ^B (2.356)	0.122 ^B (2.328)
INFL_VAR	0.069 ^A (1.851)	0.068 ^A (1.914)	0.069 ^A (1.819)	0.068 ^A (1.881)
INFL				
GOV_REG	-0.094 ^C (-2.602)	-0.098 ^C (-2.833)	-0.092 ^B (-2.529)	-0.095 ^C (-2.762)
N	147	147	147	147
Adj. R2	0.829	0.844	0.828	0.843

So globalization might capture this effect better than an openness to trade measure. The degree of government intervention, measured through the 2011 index of economic freedom from The Heritage Foundation and The Wall Street Journal, turns out to be a robust explanatory variable. High government intervention significantly increases corruption. The result follows Goel and Nelson (2010) who find that greater regulatory activity in the public arena is a breeding ground for perceived corruption. Following Braun and Di Tella (2004) I include two measures for inflation. Next to the average percentage change of consumer prices in 2008, 2009 and 2010, the log of the variance of this measure is also taken into account. In contrast to Braun and Di Tella, both measures are insignificant. Regressions (1) and (2) of table 7 deal with the effect of Internet and e-government on perceived corruption. E_GOV is highly significant and the adaptation of e-government lowers perceived corruption. Surprisingly, the number of Internet users per 100 inhabitants (INTERNET) lacks robustness. Theoretically, the effect of e-government might be rather small if inhabitants cannot access the Internet. A possibility is that contributing to the positive effect of e-government on corruption is the very process of building an on-line delivery system, requiring that rules and procedures are standardized

Table 7: OLS regressions

T-statistics are in parenthesis next to the coefficients. ^{A, B, C} Correspond to a 10, 5, 1% of significance, respectively

	(1)	(2)	(3)	(4)	(5)	(6)
	CPI_2010	CPI_2009	CPI_2010	CPI_2009	CPI_2010	CPI_2009
CONSTANT	8.752 ^C (10.676)	9.032 ^C (11.754)	7.319 ^C (4.454)	7.643 ^C (5.021)	8.492 ^C (7.174)	8.471 ^C (7.719)
GDP	-0.411 ^C (-6.296)	-0.377 ^C (-6.171)	-0.328 ^C (-3.001)	-0.360 ^C (-3.547)	-0.353 ^C (-3.269)	-0.386 ^C (-3.858)
NAT_RES	0.081 ^A (1.881)	0.083 ^B (2.053)	-0.015 (-0.224)	0.013 (0.214)	-0.009 (-0.132)	0.02 (0.329)
PROT	-0.125 ^C (-2.729)	-0.120 ^C (-2.794)	0.038 (0.458)	0.019 (0.242)	-0.035 (-0.495)	-0.047 (-0.715)
ALLDEM	-0.102 ^B (-2.160)	-0.105 ^B (-2.379)	-0.065 (-0.811)	-0.065 (-0.867)	-0.131 ^A (-1.861)	-0.130 ^A (-1.982)
GLOB	-0.034 (-0.457)	-0.062 (-0.883)				
PRESS	0.149 ^C (2.687)	0.148 ^C (2.860)	0.217 ^B (2.397)	0.194 ^B (2.315)	0.204 ^B (2.452)	0.185 ^B (2.395)
GOV_REG	-0.093 ^B (-2.481)	-0.098 ^C (-2.795)	-0.123 ^B (-2.170)	-0.118 ^B (-2.233)	-0.120 ^B (-2.272)	-0.108 ^B (-2.217)
INTERNET	-0.174 ^A (-1.777)	-0.191 ^B (-2.095)	-0.205 (-1.540)	-0.18 (-1.462)	-0.206 (-1.554)	-0.186 (-1.513)
E_GOV	-0.115 ^B (-2.171)	-0.115 ^B (-2.322)	-0.132 ^A (-1.802)	-0.135 ^B (-1.999)	-0.142 ^C (-1.956)	-0.147 ^B (-2.176)
PDI			0.079 (1.044)	0.069 (0.985)		
IDV			-0.063 (-0.726)	-0.08 (-0.991)		
MAS			0.156 ^C (2.670)	0.134 ^B (2.486)	0.137 ^B (2.509)	0.115 ^B (2.267)
UAI			0.075 (1.242)	0.062 (1.107)		
N	139	139	69	69	69	69
Adj. R2	0.833	0.854	0.845	0.866	0.843	0.865

across regions and made explicit, hereby reducing discretion and increasing transparency (Bhatnagar; 2003).

The last variables included in the regression analysis were scores for certain cultural norms by Hofstede (1997). From these cultural norms, Masculinity was found to significantly explain the dependent variables. Countries with a high score for masculinity are perceived to be more corrupt. Husted (1999) notes that Masculinity is a dimension that refers, among other things, to a focus on "material success" as opposed to a concern with the "quality of life". One would expect that this focus on material success would, in some cases, lead to a greater willingness to participate in corrupt transactions in the pursuit of material success. A side effect of including Hofstede's cultural dimensions is that natural resource endowment, Protestant religion and a long history of democracy lose some or all significance. Since the number of included countries drops from 139 to 69, one possibility for this occurrence could be that not enough countries are included in the regression to give a valuable analysis.

Conclusion

In this paper I carried out an empirical investigation on the causes of corruption analyzing country specific characteristics that explain differences in corruption levels across countries. Using cross-country data covering a wide set of nations, I examined the role of economical, political, and cultural factors on corruption. As dependent variable, a commonly used indicator of perceived corruption, namely the Corruption Perception Index is used. I performed regressions via the ordinary least squares method. First the most plausible exogenous variables were included, followed by variables more open to change.

I found that countries, which are characterized by higher economical development, have a population with a high share of Protestants, experienced a longer history of democracy, have a free press and make use of e-government experience lower perceived corruption. Also Internet has a positive effect on corruption although the results are not as robust. On the other hand, high endowments of natural resources, greater regulatory activity in the public arena, and Masculinity as a cultural trait were found to significantly increase perceived corruption. I did not find any support that a history of British law, whether

through the legal system or legal culture lowers perceived corruption. Also inflation and population size do not significantly effect perceived corruption.

Valuable contributions of further research could focus more on the use of actual experienced corruption rather than perceived corruption. When measured correctly and on a large enough scale, the use of experienced corruption indices probably can give more reliable explanations on the causes of corruption. In addition, the link between natural resource endowment, Protestant religion and a long history of democracy and Hofstede's cultural values might be interesting to further explorer. It might be useful to understand what effect of Masculinity causes some explanatory variables to lose significance.

Appendix

List of variables and definitions:

CPI_2010: 2010 Corruption Perceptions index. The perceived levels of public sector corruption, as determined by expert assesments and opinion surveys. Range between 10 (highly clean) and 0 (highly corrupt). Rescaled by subtracting it from 10.

CPI_2009: 2009 Corruption Perceptions index. The perceived levels of public sector corruption, as determined by expert assesments and opinion surveys. Range between 10 (highly clean) and 0 (highly corrupt). Rescaled by subtracting it from 10.

GDP: World Bank 2011 World Development Indicators. 2009 GDP per capita, PPP (constant 2005 international \$)

DEMO: 2011 Freedom House Freedom in the World report. Average of civil liberties and political rights indices from Freedom House. Range: 1 (most free) to 7 (least free).

ALLDEM: from Treisman (2007) and updated with more recent data. Dummy for countries that have been electoral democracies since 1970.

PRESS: Freedom House 2010 Freedom of the Press report. Countries are given a total score from 0 to 100 where 0 represents best and 100 worst.

GLOB: 2008 KOF Index of Globalization. Weighted average of the three dimensions of globalization (economic, social and political). Range:1 to 100 where higher values indicate a greater degree of globalization.

NONCOL: from Treisman (2007), a dummy variable for countries which never were a colony.

BRITCOL: from Treisman (2007), a dummy variable for countries that have been under British control.

FRCOL: from Treisman (2007), a dummy variable for countries that have been under French control.

SPPORC: from Treisman (2007), a dummy variable for countries that have been under Spanish or Portuguese control.

OTHC: from Treisman (2007) dummy variable for countries being a former colony or state other than Britain, France, Spain, or Portugal.

LEG_BR: from Treisman (2007), dummy classification for a British Common Law Legal origin.

LEG_OTH: from Treisman (2007), dummy classification for a Commercial Code legal origin other than British or Socialist.

LEG_SOC: from Treisman (2007), dummy classification for a Socialist/Communist legal origin.

POP: 2011 CIA World Factbook estimate of a countries total population.

GOV_REG: The Heritage Foundation and The Wall street journal 2011 index of Economic Freedom. Average of the Business Freedom, Government Spending and Monetary Freedom pillars. Range from 0 to 100, where 100 represent the maximum freedom.

INFL: Average of the absolute value of the per cent change in average consumer prices in 2008/2009/2010 from the IMF April 2010 World Economic Outlook.

INFL_VAR: Logarithm of the variance of the absolute value of the per cent change in average consumer prices in 2008/2009/2010 from the IMF April 2010 World Economic Outlook.

INTERNET: ITU World Telecommunication/ICT Indicator database number of internet users of a country per 100 inhabitants in 2008.

PDI: Assigned score for the degree of 'Power Distance' according to Hofstede's (1997) cultural dimensions. A higher value means more Power Distance.

IDV: Assigned score for the degree of 'Individualism' according to Hofstede's (1997) cultural dimensions. A higher value means more Individualism.

MAS: Assigned score for the degree of 'Masculinity' according to Hofstede's (1997) cultural dimensions. A higher value means more Masculinity.

UAI: Assigned score for the degree of 'Uncertainty Avoidance' according to Hofstede's (1997) cultural dimensions. A higher value means more Uncertainty Avoidance.

CATH: Percentage of population in 1980 being Catholic. Source Treisman (2007).

PROT: Percentage of population in 1980 being Protestant. Source Treisman (2007).

MUSL: Percentage of population in 1980 being Muslim. Source Treisman (2007).

NO_REL: Percentage of population in 1980 that is not Catholic, protestant or Muslim. Source Treisman (2007).

NAT_RES: World Bank World Development Indicators 2011. Total natural resources rents in 2009 as a percentage of GDP.

E-GOV: The 2010 United Nations E-participations index focuses on the use of the Internet to facilitate provision of information by governments to citizens, interaction with stakeholders and engagement in decision-making processes. Range from 0 to 1 where 1 indicates high e-participation.

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