REEXAMINING THE RELATIONSHIP BETWEEN PRESS FREEDOM AND CORRUPTION

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ABSTRACT

A widespread and commonly held belief is that a free and independent press fulfills a both signifi-cant and important role in fighting corruption. In numerous policy proposals and general recom-mendations, the importance of media plurality, media freedom and competition is emphasized in curbing corruption. Nonetheless, the knowledge as to how effective media and a free press actually perform to combat corruption is still limited, albeit growing.

This working paper demonstrates that research on the relationship between press freedom and corruption is far from completed, and that additional and new approaches are required to move forward. Here, we combine two different models of the relationship between press freedom and corruption and bring forward more and improved data, including indicators of press freedom, and a number of different measures of corruption. In addition, we apply new estimation techniques to analyze our data. Based on these estimation techniques, it is therefore feasible to handle known problems that arise when estimating models with time-invariant or almost time-invariant variables correlated with unit effects. Similar techniques have not yet been applied in previous research on the relationship between press freedom and corruption. Thus, our application will serve as a ro-bustness test of earlier findings.

The results stress the importance of looking beyond the simple models of direct effects of press freedom and the level of corruption, as the relationship seems to be more complicated than that. Our results show that the role of a free press in fighting corruption differs depending on whether the country at play has a well, newly, or non-established electoral democracy. The effect of press freedom on corruption starts off negative or insignificant for countries with very low levels of de-mocracy, and becomes more positive the more democratic a country is.

Keywords: Press freedom, corruption, democracy, quality of government, fixed effects vector de-composition

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A widespread and commonly held belief is that a free and independent press fulfills a both significant and important role in fighting corruption. International organizations, such as the World Bank and Transparency International, regard media and a free press as one of the major solutions in curbing corruption. In numerous policy proposals and general recommendations, the importance of media plurality, media freedom and competition is emphasized. Nonetheless, the knowledge as to how effective media and a free press actually perform to combat corruption is still limited, albeit growing.

This working paper demonstrates that research on the relationship between press freedom and corruption is far from fulfilled, and that additional and new approaches are needed. In this chapter, we combine two different models of the relationship between press freedom and corruption and bring forward more and improved data. We include multiple indicators and subcomponents of press freedom, and a number of different measures of corruption. In addition, we apply a new estimation technique called *fixed effects vector decomposition* (FEVD) to analyze our data. FEVD is similar to a statistical "three-stage rocket" which among other things can handle known problems that arise when estimating models with time-invariant or almost time-invariant variables correlated with unit effects (Plümper & Troeger 2007). Similar techniques have not yet been applied in previous research on the relationship between press freedom and corruption. Thus, our application will serve as a robustness test of earlier findings.

This working paper will revise the contemporary research regarding press freedom and corruption, and additionally bring forward newer data and a different method to examine the relationship. In consequence of this, the results will hopefully highlight new and interesting findings that will act as a stepping-stone for future research.

Press freedom and Corruption

The concept of press freedom is widely debated in the literature of mass communication. Early definitions reflect post-Second World War geopolitical constructions, and primarily focus on freedom from government control (see e.g., Lowenstein 1970, Weaver 1977, Picard 1985, Hachten 1987, Hagen 1992). Subsequently, definitions of the concept differentiate between a classical liberal perspective on media freedom – that media should serve to protect the individual from the abuse of the state – and a more radical democratic perspective – media should seek to equalize the imbalances in society between the degree of freedom and independence enjoyed by the media, and the

degree of freedom enjoyed by the citizens in the access to media content (see e.g., Curran 1996, Price 2002, McQuail 2005).

Citizens' access to media content and the *availability of information* are important underlying assumptions and crucial determinants for the efficiency of economic markets. Analogous assumptions are being made concerning political markets. For instance, citizens require information to become knowledgeable in order to make intelligent choices regarding their voting. Economists have increasingly emphasized the crucial role played by information in order to avoid market failures and for achieving efficient allocations of resources (Stiglitz 2000). The principal-agent framework, commonly used by both economists and political scientists, is defined by the asymmetry of information between principal and agent (Besley & Burgess 2002, Aidt 2003, Coyne & Leeson 2004, Miller 2005, Teorell 2007, Lindstedt & Naurin 2010). In this case, the principals are typically citizens/voters and the agents are politicians/bureaucrats. The origins of corruption, in this type of 2-model, can be traced back to an information asymmetry where the agent has an information advantage over the principal.[1] A free press is supposed to contribute to more transparency and a freer flow of information which will decrease the information asymmetry.

Theoretically, causes and determinants of corruption can be found in a variety of characteristics of countries' economic, political, and social systems. Treisman (2000) argues that the countries' officials are balancing expected *costs* of a corrupt act against the expected *benefits* and, countries' historical traditions might affect the perceived costs and benefits of corrupt actions (see e.g., Root 1996, Rothstein 2007). The most obvious cost is the risk of getting caught and punished. For a number of reasons, the risk of exposure and getting caught is assumed to be larger where *free media* is able to provide citizens with impartial and sufficient information, and independently scrutinizes holders of political power (see e.g., Norris 2000, Zaller 2003, Norris 2006). Besides its apparent impact on democracy, economic development increases the spread of education, literacy, and depersonalized relationships. Thus, it can be concluded that corruption is likely to be less occurring in democratic and more economically developed countries with a freer press and where populations are more educated and literate.

However, the probability of getting caught also depends on the effectiveness of a country's *legal system*. First, legal systems differ in the degree of protection and the opportunity for recourse they offer to private property owners harmed by corrupt acts by officials, and additionally differ in the formulations and original intents of laws – *common law systems* and *civil law systems* (see e.g., David &

Brierly 1985, La Porta et al. 1999, Treisman 2000).[2] Another difference is in the prevailing expectations and practices that preside over how they are enforced – what Treisman terms as *legal culture*. Second, the procedural aspects of laws also differ across countries. Treisman claims that, in Britain and some of its former colonies, the focus is on the social role of law and the relative importance of law in preserving social order. In other cultures, social order is not so much associated with adherence to procedures as with hierarchy and the authority of offices. Thus, one might expect countries with different colonial traditions to have different legal cultures – and different degrees of susceptibility to corruption – irrespectively of whether they have common law or civil law systems.[3] Based on this reasoning, one can expect that in countries with common law systems (especially Britain and its former colonies), the legal system is more efficient and the corruption level is lower.

Another way in which countries' historical tradition might affect the perceived costs of corrupt actions is through the influence of *religion*. Treisman (2000) argues that religious traditions often have been thought to condition cultural attitudes towards social hierarchy. Where more 'hierarchical religions' – Catholicism, Eastern Orthodoxy, Islam – dominate, challenges to office-holders might be rarer than in cultures shaped by more egalitarian or individualistic religions, such as Protestantism. Nevertheless, religion can also affect corruption levels in the different relational settings between church and state. In religious traditions such as in Protestantism, institutions of the church may play a role in monitoring and denouncing the abuse of power by state officials. In other traditions – such as in Islam – where church and state hierarchies are closely intertwined, such a role may be uncommon (see e.g., La Porta et al. 1997, Treisman 2000, Serra 2004). This reasoning implies that corruption is likely to be less common in countries with a Protestant tradition.

An equally complicated set of factors might be the expected benefits from corruption, which a rational official would balance against the expected costs. With the wording of Daniel Treisman: "Most corrupt acts involve a bargain between the official and some private actor. The official uses the powers of office to create concentrated gains for the private partner beyond those he could earn without state intervention" (Treisman, 2000: 405). State actions, such as regulation and taxation, may be used to give the partner advantages over rivals in the market, and in return, the official receives a part of the profit.

Several factors affect the scale of profits the official can create for his/her partner by intervening in the market. Most obviously, there is a positive correlation between state control of the economy and the extent of corruption – the larger the state and the greater the extent of state control, the

greater the availability of options for corruption (Tanzi, 1994). Second, the ability of an official to provide a private partner profitable protection in some domestic market, will depend on countries' openness to trade and external competition from imports (see e.g., Mauro 1995, Ades & Di Tella 1999, Treisman 2000). From this it can be concluded that corruption is likely to be lower in democratic and more economically developed countries with a freer press and where the citizens are more educated and literate, but also that historical aspects are very important determinants of corruption.

If we take a look at the previous empirical studies on press freedom and corruption, the main picture presents a clear correlation between these two variables (Ahrend 2002, Brunetti & Weder 2003, Staphenhurst 2004, Chowdhury 2004, Norris 2004, Macdonell & Pesic 2006, Freille et al. 2007, Olken & Barron 2009, Lessmann & Markwardt 2010). Common indicators, such as newspaper circulation (Besley & Burgess 2002, Adserà et al. 2003, Pellegrini & Gerlagh 2008), media ownership (Besley & Prat 2001, Djankov et al. 2003) and media competition (Suphachalasai 2005), show strong and robust direct effects on levels of corruption, also with alternative measurements and when additional important explanatory variables are being accounted for. However, it is important to distinguish between the free press' role in making information available to the public (transparency), and the public's access to sanctioning mechanisms and their abilities to actually *kick the rascals out* (political accountability) (see e.g. Lindstedt & Naurin 2010).

One of the most ambitious and rigorous research efforts regarding the relationship of press freedom and corruption is that of Brunetti and Weder (2003), where they use alternative measures for both the independent and dependent variable, and where several robustness checks are performed (they test two different press freedom indexes and four different measures of corruption, across countries as well as over time). The results show significant positive effects of press freedom on three of the four corruption control indices, whereby they conclude that in countries where the media is reasonably free from any kind of restriction concerning their activities, corruption levels are likely to be low. Importantly, Brunetti and Weder also address and refute the suspicion that there could be a potential endogeneity problem involved with respect to the causality between press freedom and corruption, this stemming from the incentives for corrupt governments to restrict press freedom (see e.g., Norris 2006, Sussman 2001).

On the basis of their statistical analysis, Brunetti and Weder conclude: "By way of illustration, in the case of Indonesia it would mean a reduction in corruption to the level of Singapore, for the Russian

Federation it would imply reaching the corruption level of the Slovak Republic, and for Nigeria the level of Belgium." (Brunetti & Weder (2003: 1821). This exemplifies a rather naïve notion of the nature of the relationship in previous studies. However, high levels of press freedom are not a quick fix. Instead, reforms focusing on press freedom should, just as Lindstedt and Naurin (2010) argue if we are to see any effects of diminished corruption, be accompanied by measures for strengthening citizens' capacity to act upon the available information.

Lindstedt and Naurin's (2010) study of the relationship between transparency and corruption is an illustration of how a thorough elaboration of the focal relationship can qualify for our understandings of causal mechanisms. Their claim, which is substantiated by empirical results, is that just making information available will not prevent corruption unless there are favorable conditions already in place for *publicity* and *accountability*, i.e. media circulation, free and fair elections, and an educated electorate.

Furthermore, Lindstedt and Naurin attempt to develop the oversimplified principal-agent model. They argue that we cannot take for granted that transparent information regarding the agent will always reach the principal no matter how available or accessible the information is, and that economists have failed to acknowledge that there are costs involved in obtaining information. Lack of demand, lack of mediators, and citizens' lack of capabilities to process the information, can hinder a development towards good governance. Lindstedt and Naurin conclude that 'increasing the chances of publicity and accountability strengthens the power of transparency to reduce corruption'.

Lederman, Loayza, and Soares (2005), explore the link between political institutions and corruption, and argue for the relevance of explanatory variables unique to corruption. The results show that corruption tends to decrease systematically with democracy, parliamentary systems, democratic stability, and press freedom. Additionally, the decrease survives the inclusion of the different sets of controls, with the exception of the press freedom variable, which captures the effect of economic development on corruption. The result is also interesting by signifying the only previous empirical study of the relationship between press freedom and corruption that indicates insignificant results.

An additional study demonstrating the necessity of estimating interaction effects in explanatory models of corruption from a wider perspective is Ahrend's (2002) analysis of the impact of education on corruption. Ahrend's analyses show that the nature of the relationship depends on press freedom. He notes that a high degree of press freedom acts as a channel through which education

decreases corruption. Only in countries where press freedom is well developed, is there a positive effect of education on corruption. The causal direction, according to his work, runs from a freer press to lower corruption and is a further example of elaboration which leads to improved or nuanced policy recommendations.

Lessman and Markwardt (2010) investigate the relationship between decentralization and corruption and whether public monitoring, reflected by press freedom, has an impact on the influence of decentralization on corruption. Their major finding is that benefits of decentralization in developing countries only occur if there is a supervisory body that strengthens the accountability of bureaucrats, with the freedom of the press as one such possible institution – decentralization counteracts corruption in countries with a high degree of press freedom, while countries with a low degree of press freedom suffer from decentralization (Lessman & Markwardt, 2010: 632).

While many studies of the relationship between press freedom and corruption have dedicated substantial empirical contributions to the economic side of the openness–corruption nexus (trade, trade barriers, capital freedom, and so forth), the analysis of Charron (2009) gives further insight into other components of globalization. Charron examines the relationship between two non-trade forms of international openness (social and political) and corruption while taking into account the countries' level of press freedom. The study pays specific attention to how international variables (socio-political openness) are conditioned by domestic institutions (the level of press freedom) concerning their impact on government corruption. The analysis shows empirically that socio-political openness (i.e. openness to trade, international organizations, social flows of information) has little to no impact on corruption in the absence of press freedom. Additionally, while the empirical evidence suggests that political and social openness have a significant impact in fighting corruption given a free press, the impact of such international forces are negligible in cases where the level of press freedom is low.

Finally, Chowdhury (2004) presents a concise treatment of the topic. The objective is similar to Brunetti and Weder (2003), although Chowdhury also incorporates the effects of democracy on corruption. In his view, media's role as an informative device and the standing of democracy acting as a punishing mechanism, should both help towards restraining corruption. The empirical findings of the paper support this conclusion. Both press freedom and democracy are powerful and significant controls on corruption and this result is robust in different settings.

While all these studies (with one exception) reach the same basic conclusion – that press freedom is good news for corruption control – nearly all studies use an aggregate measure of press freedom, most of them focus on direct effects only, and do relatively little in matters of testing for sensitivity to changes in the set of conditioning variables.

In the most elaborate and complete analysis of the relationship between press freedom and corruption, Freille, Haque and Kneller (2007) also come to the same general conclusion regarding the effects of press freedom on corruption. Although, in addition to testing for the robust relationship between the aggregate press freedom and corruption, Freille et al. use previously unexplored data concerning different forms of restrictions on press freedom. Additionally, their study entails a large time-series cross-section regression analysis in combination with an extreme bounds analysis (EBA) accompanied by the use of instrumental variables (IV) to test the robustness and the direction of causality of the relationship between press freedom and corruption. The results verify a close relationship between press freedom and bureaucratic corruption control, thus confirming the findings of earlier research. In their models, they control for a wide set of variables found consistently related to corruption also in previous empirical studies (see fc Treisman 2000).

The Freille et al. study also confirms that analyses of *subcomponents* of inclusive press freedom indices are fruitful enterprises in pushing the research forward with regard to pinning down what mechanisms are driving the relationship. Interestingly, their analyses reveal that the subcomponent *laws and regulations* from the popular Freedom House – Freedom of the Press index (see description in appendix) fails to qualify as robust, while the two other subcomponents – political and economic pressures on the press – prove to be robust to changes in model specifications. In other words, the results suggest that it is the *political environment* and *economical environment* (in that order), and not *laws and regulations* that drive the strong relationship between press freedom and corruption. The authors thus conclude that the improvements in certain categories of press freedom can have an important impact on corruption. Hence, reducing *political* influence on the media may be the most effective way to reduce corruption levels (Freille et al. 2007).

To summarize, all studies mentioned, with one important exception, reach the same basic conclusion: the importance of a free press in curbing corruption will serve to improve citizens' accessibility to information which in turn will make it more difficult for politicians and public servants to cover up, or get away with, corrupt behavior. In this working paper, we attempt to combine the approaches found in earlier research simultaneously in order to present a complete account of the

relationship between press freedom and corruption. Our ambition is to pursue the approaches in previous research and perform systematic robustness tests such as the use of multiple indicators and composite measures of press freedom and corruption, as well as error bounds analysis applied by Freille, Haque and Kneller. In addition, we want to elaborate the relationship further by introducing the subcomponents of press freedom (Freille et al 2007), as well as interaction variables conditioning the focal relationship (Lindstedt & Naurin 2010). Lastly, we aim to apply new estimation techniques that can remedy some of the well-known estimation problems present in analyses of time-series cross-section data (Plümper & Troeger 2007).

Data and method

The overall purpose of our empirical analyses is to check the robustness of findings from earlier studies of the relationship between press freedom and corruption. The general strategy applied in all the analyses include 1) replication with an expanded number of observations, 2) the use of three different measures of corruption, and 3) the application of new estimation techniques that are tailored to handle estimation problems that arise from having many time-invariant variables when modeling regressions.

1) Replication

Regarding the replications, we will reanalyze explanatory models of corruption from two earlier studies, Freille et al. (2007) and Lindstedt & Naurin (2010). These two studies are selected for being among the most elaborated analyses of the relationship between press freedom and corruption. In the first part of the empirical analysis, we will use Freille et al.'s (2007) base model as a starting point. The idea is to, as closely as possible, replicate Freille et al.'s analysis with more empirical observations.

With reference to the base model, nearly all the variables used as control variables in the study of Freille et al. are included, but with more extensive year spans.[4] These variables portray among other things political rights, freedom from government intervention, democracy over time, as well as several dummies capturing countries' historical characteristics as well as present ones (see detailed information concerning the variables in the attached appendix). Taken altogether, the number of observations in our analysis is a great deal larger (in the range of 831 to 1 283 observations) than in the Freille et al. study (approximately 487 observations). Regarding the main independent variable, we use the Freedom of the Press index, as in Freille et al.'s study, but with a wider, updated time

span: 1994-2006 in comparison to 1994-2004.

In the second part of the empirical analyses, we are inspired by the models estimated in Lindstedt and Naurin's study. We find the Lindstedt and Naurin models attractive because of their simplicity compared to the very large model of Freille, Haque and Kneller. Originally, Lindstedt and Naurin estimated their model on cross sectional data. Here, we will expand the number of observations considerably by estimating the Lindstedt and Naurin model on time-series cross-section data for the time span running from 1960 to 2009, from between 81-110 observations to 662-859 observations. Note however, our application of the Lindstedt and Naurin model is not an exact replication of their original cross-sectional only model.

2) Multiple indicators of corruption

For the purpose of additional robustness checks, we let three highly correlated but different measures of corruption enter as dependent variables in the regression models one at the time: "Corruption perceptions index" from Transparency International (1995-2009), "Freedom from corruption" from Heritage Foundation (1994-2006) and "Control of corruption" from the World Bank (1996-2007). Readers should be aware of that, in the forthcoming regressions, the "Corruption perceptions index" has been standardized from the original scale of 0 (highly corrupt) to 10 (highly clean) to 0-1. Additionally, "Freedom from Corruption" has been standardized from 0 (highly corrupt) to 100 (highly clean) to 0-1. The World Bank "Control of Corruption index" is standardized with the mean of 0 and standard deviation of 1 each year of measurement. With this coding, we expect a positive and significant relationship between press freedom and corruption: the freer the press, the cleaner the country.

All three measures of corruption originate from credible sources and are used regularly in empirical analyses of corruption. They all claim to assess variations of the incidence of corruption within and between countries.[5] A scatter plot of the focal relationship between press freedom and the Transparency International measure of corruption, using the time-series cross-section data that we have chosen to analyze, typically shows a curvilinear bivariate relationship between press freedom and corruption: moving towards a freer press becomes more important for reducing corruption levels in countries with relatively high levels of press freedom to begin with.[6]

FIGURE 1, FREEDOM OF THE PRESS AND CORRUPTION (TRANSPARENCY INTERNATIONAL CORRUPTION PERCEPTION INDEX).
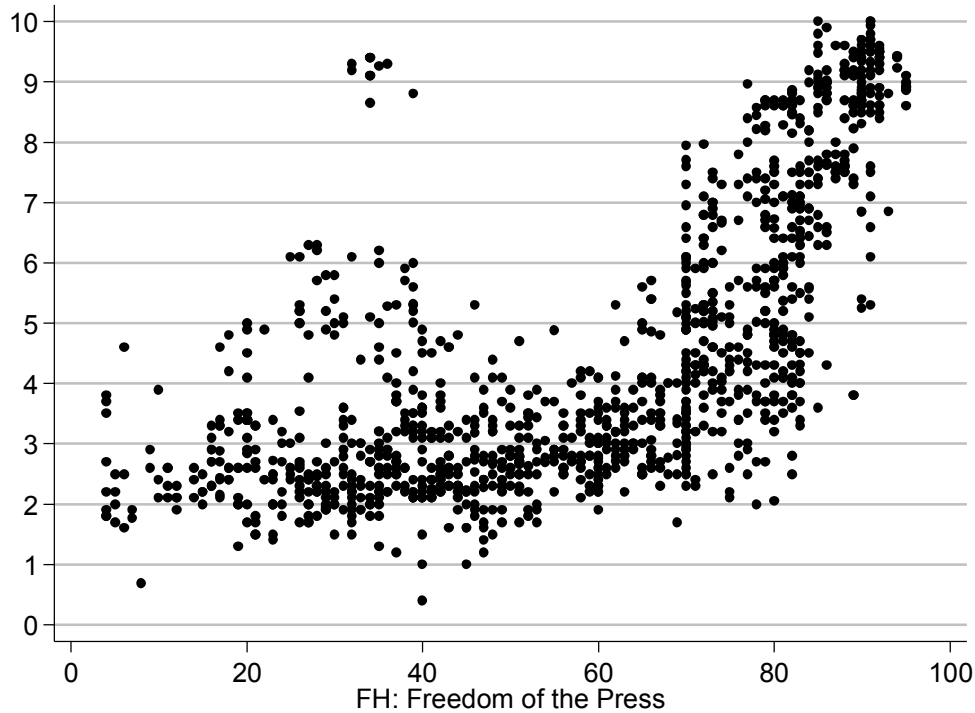
Examples of countries scoring a high level of corruption and a low level of a free press using "Corruption Perception Index" from Transparency International are among others Nigeria, Myanmar, Libya and Turkmenistan. Scoring a value of a lower level of corruption, and as well a higher level of press freedom, are countries like Zimbabwe and Jordan. Countries with low levels of corruption and a high level of press freedom are for example Finland, Canada and Austria. An outlier scoring low levels of corruption but with merely a medium level of a free press is Singapore, and an outlier with the opposite scenario – a high level of corruption but with a medium-high level of a free press, is characterized by Bangladesh.

3) New estimation technique

The robustness check with the highest potential to alter what we know about the relationship between press freedom and corruption is the rerun of the previous studies with a new estimation technique that can handle problems that arise from having many time-invariant variables in the model. All analyses will be performed using both a standard OLS method and a new estimation technique called *fixed effects vector decomposition* (FEVD) – an estimation technique that is more or less

tailored for data analyses of time-series cross-section data enclosing many time-invariant variables (Plümper & Troeger 2007). Plümper and Troeger show that if a variable has low within-country variation and large between-country variation – which is typically the case in this type of time-series cross-section data – treating the variable as time-invariant in a FEVD-model gives more efficient and less biased point estimates.[7]

We believe the proposed estimation procedure has a large potential of altering the understanding of the relationship between press freedom and corruption, as it has been shown to generate new findings that do not match with earlier results in studies of e.g. human well-being (Boyce 2009), crime (Worrall 2008), trade and foreign direct investments (Márquez-Ramos 2008), deficit spending (Schneider 2008), bureaucratic efficiency (Dahlström et al. 2010), and public policies (Plümper & Schneider 2007).

In the coming analyses, twenty-one of the variables included in Freille et al.'s (2007) model have been identified as time-invariant using the rule of thumb provided by Plümper and Troeger.[7] Our *democracy over time* variable contains each country's average score on the Freedom House democracy index 1972-2009, and consequently this variable is also defined as time-invariant since the within country variation is zero. The stationary dummy-variables for legal origin, colonial heritage, and religion are all time-invariant by definition (see appendix for details).

The measurement "Freedom of the Press index" from Freedom House entails three subcomponents portraying the legal, political and economic aspects of the phenomenon. In previous research, elaborations including the subcomponents have shown that it is mainly the *political* and *economic* subcomponents that drive the focal relationship while *laws and regulations* result in insignificant values. In the final analyses of the paper, we demonstrate what occurs in the regressions when the subcomponents of press freedom are estimated simultaneously with the global index of press freedom.

Robust effects of press freedom on corruption

Does the robust relationship between press freedom and corruption change when we add observations, apply multiple indicators of corruption, and take into account that many of the standard determinants of corruption are time-invariant? Our results of the elaborated analyses show that the answer is no – the focal relationship remains robust and significant: *The freer the press the cleaner the country*.

In table 1, we display three comparisons of the two estimation techniques, one for each measure of corruption. As expected from previous research, there are significant direct linear effects of press freedom on all measures of corruption in the OLS-models 1, 3, and 5. For instance, the results from table 1 suggest that *ceteris paribus* moving from minimum (0) to maximum (100) on the FH Press Freedom index (model 1) will produce a change of .40 in our Corruption Perception Index (0-1). The estimated effects are robust across all three measurements of corruption. More importantly, when we expose the focal relationship for the alternative estimation technique, the effects of press freedom remain significant and robust across all three measurements.

TABLE 1, MODELING THE EFFECTS OF PRESS FREEDOM ON CORRUPTION (POOLED OLS AND FEVD, UNSTANDARDIZED REGRESSION COEFFICIENTS)

	Corruption Perceptions Index OLS (1)	Corruption Perceptions Index FEVD (2)	Freedom from corruption OLS (3)	Freedom from corruption FEVD (4)	Control of corruption OLS (5)	Control of corruption FEVD (6)
Time-Invariant variables						
Freedom of the Press (0-100)	0.004***	0.004***	0.002***	0.002**	0.015***	0.015***
Trade	-0.001	-0.001	0.002***	0.002**	-0.000	-0.001
Imports	0.003***	0.003*	-0.004***	-0.003**	0.005	0.007
Fuel	-0.001***	-0.001**	-0.002***	-0.002***	-0.005***	-0.005***
Log of GDP	0.106***	0.110***	0.104***	0.107***	0.420***	0.434***
Parliamentary system (0/1)	0.005	0.016	0.041*	0.049	0.110	0.154
Presidential system (0/1)	-0.001	0.000	0.048**	0.050	0.046	0.061
Maj. Electoral system (0/1)	0.011	0.008	0.048***	0.046**	0.029	0.017
Political Rights	0.020***	0.017*	-0.007	-0.009	0.022	0.011
Military Expenditure (% of GDP)	0.005	0.009	-0.005	-0.002	0.030**	0.047**
Former French Colony	0.015	0.031	0.040**	0.045	0.103	0.137
Former Spanish Colony	-0.002	-0.016	0.018	0.005	-0.231***	-0.292*
Former British Colony	-0.072***	-0.047	0.026	0.039	-0.116	-0.040
Ever a colony	0.001	-0.020	-0.078***	-0.086*	-0.111	-0.166
English legal tradition	0.053***	0.040	0.079**	-0.025	-0.032	-0.078
Socialist legal tradition	-0.199***	-0.197***	-0.127***	-0.221***	-0.836***	-0.838***
French legal tradition	-0.057***	-0.055	-0.014	-0.108**	-0.218**	-0.214
German legal tradition	0.000		0.094**		0.000	
Scandinavian legal tradition	0.082***	0.104	0.000	-0.083	0.256**	0.344

Catholicism as dominant religion	-0.054***	-0.041	-0.015	-0.006	-0.160***	-0.117
Protestantism as dominant religion	0.083***	0.083	0.207***	0.208**	0.240***	0.227
Democracy over time	0.002	0.002	-0.015***	-0.015*	-0.001	0.000
Time-Variant variable						
Freedom from Government	-0.001***	0.000	-0.001***	-0.000	-0.005***	0.001
Residuals		1.000		1.000		1.000
Constant	-0.689***	-0.836***	-0.413***	-0.417***	-3.976***	-4.524***
Observations	929	929	1283	1283	831	831
R^2	0.856	0.976	0.710	0.880	0.865	0.978

Note: In the analyses, the Freedom of the Press index has been reversed so that 0 equals "least free" and 100 equals "most free". * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Regarding the control variables, most of the indicators for countries' economic development maintain significant values through all six models. The results also confirm the by far strongest and most consistent finding of earlier research showing that lower perceived corruption correlates closely with higher economic development. However, some of the other time-invariant variables are no longer statistically significant when applying an alternative estimation technique. In models 1 and 2, the largest changes take place among the variables measuring countries' historical and cultural characteristics where, contrary to what one would expect, most of the covariates become insignificant when applying FEVD, which may of course be due to the moderately high correlations among them. Nevertheless, the socialist legal tradition covariate retains its significant value through all six models. In models 3 and 4, the same pattern is revealed among some of the countries' political characteristics, and in models 5 and 6, for some of the legal and religious traditions' covariates. Lastly, in all models, the FEVD procedure fails to retain significant values of the time-variant covariate freedom from government.

In table 2, we estimate a much smaller model inspired by Lindstedt and Naurin (2010). In their model they estimate the effects of *rule of law* using a measure from UNDP, which undoubtedly is the strongest determinant of a country's corruption level. However, even when taking rule of law into account, there are still effects of freedom of the press and level of democracy.

Recall that in this model, press freedom is modelled to interact with levels of democracy. The OLS effects of press freedom, levels of democracy and the interaction term on corruption levels are all highly significant for models 1 and 5. The interaction effect (FP x DoT) is particularly strong; in fact, although the coefficients for Freedom of the Press (FP) and Democracy over time (DoT) both

have negative signs, the *combined* effect of the three variables become positive for all countries that score very high on both press freedom and levels of democracy.

TABLE 2, PRESS FREEDOM AND CORRUPTION (POOLED OLS AND FEVD, UNSTANDARDIZED REGRESSION COEFFICIENTS).

	Corruption Perceptions Index	Corruption Perceptions Index	Freedom from corrupt-ion	Freedom from corrupt-ion	Control of corruption	Control of corruption
	OLS	FEVD	OLS	FEVD	OLS	FEVD
	(1)	(2)	(3)	(4)	(5)	(6)
Time-Invariant variables						
Freedom of the Press (FP)	-0.003***	0.001	-0.000	-0.001	-0.006***	-0.007
Former British Colony	0.008	-0.026	0.043***	0.055	0.008	0.017
Trade	0.000	0.000	-0.000*	0.000	-0.000	-0.000
Democracy over time (DoT)	-0.021***	0.024	0.000	-0.005	-0.049***	-0.046
Time-Variant variables						
Rule of Law	0.181***	0.249***	0.182***	0.313***	0.862***	0.966***
Energy Use	0.000	0.000	0.000	-0.000**	-0.000	-0.000
GDP	0.000***	0.000	0.000***	-0.000	0.000***	0.000
Interaction effect (FP x DoT)	0.000***	-0.000	0.000	0.000	0.001***	0.001
Residuals		1.000		1.000		1.000
Constant	0.469***	0.353***	0.379***	0.569***	0.134**	0.258
Observations	662	662	829	829	859	859
R^2	0.892	0.980	0.775	0.894	0.944	0.982

Note: "Interaction effect" is made of the variables "Freedom of the Press" and "Democracy over time" and thus shows the interaction effect between these two variables when testing for other factors of corruption. More elaborate descriptions of the variables can be found in the appendix. In the analyses, the FH Press Freedom index has been reversed so that 0 equals "least free" and 100 equals "most free". * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

As mentioned earlier, the freedom of the press measurement from Freedom House encloses three subcomponents representing the legal, political and economical aspects of the phenomenon. Estimations of the effects of the subcomponents can inform us further about the relationship between press freedom and corruption. Prior elaborations including the subcomponents have shown that it is mainly the political and economic subcomponents that drive the focal relationship, while laws

and regulations that influence media content turns out insignificant. In table 3, we demonstrate what happens in the regressions when the subcomponents of press freedom are estimated simultaneously.

TABLE 3, PRESS FREEDOM SUBCOMPONENTS AND CORRUPTION (POOLED OLS AND FEVD, UNSTANDARDIZED REGRESSION COEFFICIENTS)

|	Corruption Perceptions Index OLS (1)	Corruption Perceptions Index FEVD (2)	Freedom from corruption OLS (3)	Freedom from corruption FEVD (4)	Control of corruption OLS (5)	Control of corruption FEVD (6)
Time-Invariant variables						
Freedom of the Press (FP)	-0.001	0.002	-0.003**	-0.003	-0.007***	-0.006
Former British Colony	0.008	-0.025	0.042***	0.051	0.006	0.016
Trade	0.000	0.000	-0.000	0.000	-0.000	-0.000
Democracy over time (DoT)	-0.021***	0.023	-0.002	-0.009	-0.052***	-0.045
Time-Variant variables						
Laws and regulations that						
Influence media content	-0.000	-0.000	0.001**	0.001	0.000	-0.000
Political pressures and						
controls on media content	-0.001***	-0.001	0.001	-0.000	-0.001	-0.000
Economic influences over						
media content	-0.000	0.000	0.000	0.001	0.000	-0.001
Rule of Law	0.184***	0.249***	0.186***	0.318***	0.864***	0.982***
GDP	0.000**	0.000	0.000***	-0.000	0.000***	0.000
Energy Use	0.000	0.000	0.000	-0.000***	-0.000	-0.000
Interaction effect (FP x DoT)	0.000***	-0.000	0.000	0.000	0.001***	0.001
Residuals		1.000		1.000		1.000
Constant	0.479***	0.361***	0.383***	0.581***	0.142**	0.293
Observations	662	662	829	829	859	859
R^2	0.893	0.980	0.778	0.895	0.944	0.982

Note: "Interaction effect" is made of the variables "Freedom of the Press" and "Democracy over time" and thus shows the interaction effect between these two variables when testing for the factors of corruption. More elaborate descriptions of the variables can be found in

As shown in table 3, when we estimate the subcomponents simultaneously, the same pattern shown in table 2 occurs yet again. The significant effect of the freedom of the press measure is absorbed by the rule of law variable. When using pooled OLS, a significant relationship between press freedom and two of the corruption estimates remains. However, including the subcomponents do not confirm findings from previous research – that mainly the *political* and *economic* subcomponents drive the focal relationship. Instead, we find only small significant effects of legal and political aspects on the focal relationship (model 1 and model 2).

The interaction effect remains unchanged when the subcomponents are included. This means that the effect of press freedom on corruption starts off negative or insignificant for countries with very low levels of democracy, and becomes more positive the more democratic a country is. In other words, results confirm that there is a curvilinear relationship between freedom of the press and corruption. This finding can be illustrated by plotting the relationship between press freedom and corruption separately for four countries with different levels of democracy (see Figure 2).
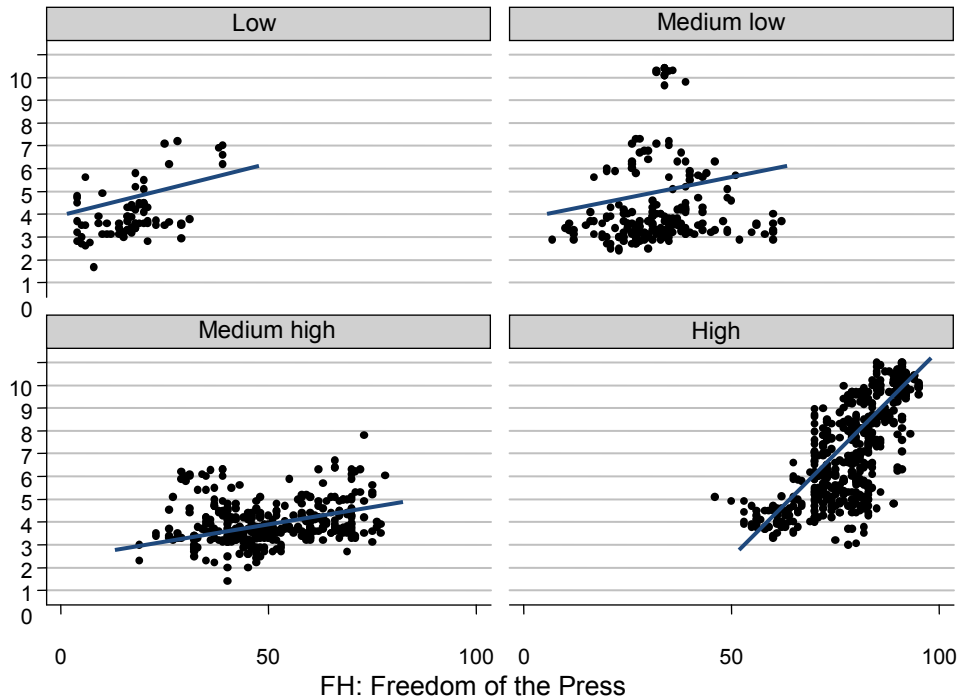
Graphs by dem4

Note: The figures show the focal relationship separately for four groups of countries depending on the level of democracy (each country's average score on the Freedom House Democracy index 1970-2009).

Figure 2 reveals how the relationship between press freedom and corruption is portrayed. At a low level of democracy, the relationship is slightly positive carrying small effects. This pattern is sustained even with higher levels of democracy, although slowly advancing towards a positive relationship. Not until the democracy level reaches high levels, is there a strong and positive relationship between press freedom and corruption. The relationship is thus J-shaped. "Low" displays the relationship between our dependent and independent variables in countries with low levels of democracy, such as Nigeria and Cuba. In "Medium Low", we find among others, Tunisia and the United Arab Emirates, as well as the outlier Singapore. In "Medium High", Bangladesh is displayed enclosing a high level of corruption but a medium-level of press freedom. Chile is portrayed as the "cleanest" country in terms of level of corruption with an additionally high level of press freedom. In "High", where the countries with the highest democracy levels are presented, we find for example Finland and Iceland at the top, whereas Portugal portrays a country at the bottom.

Conclusions

The justification for the analyses of this working paper was to summarize and robustness test the findings from earlier studies of the relationship between press freedom and corruption. We have replicated prior analyses with an expanded number of observations. Additionally, we have rerun the analyses with three different indicators of corruption and with a new estimation technique. We obtain results that largely confirm earlier findings from the studies we replicated.

The results stress the importance of looking beyond the simple models of direct effects of press freedom and the level of corruption, as the relationship seems to be more complicated than that. We wish to underline that the curvilinear relationship noted by numerous scholars seems best modelled with an interaction between the level of electoral democracy and the level of press freedom (which was also observed in figure 1). The results suggest that the role of a free press in fighting corruption differs depending on whether the country at play has a well, newly, or non-established electoral democracy: among the well-established electoral democracies, the level of press freedom is very important for the ability to fight corruption. Among the newly established democracies, the level of press freedom is less important and, maybe most notably, among countries with weak electoral democracy, the level of press freedom has a relatively small impact in fighting corruption. Instead, a hierarchy of needs becomes evident. These countries are rather in need of things like a well-functioning legal system before they can indulge in luxury such as a free and independent press.

Notes

[1] Corruption ordinarily refers to the use of public office for private gains, where an official (the agent) entrusted with carrying out a task by the public (the principal) engages in some sort of malfeasance for private enrichment which is difficult to monitor for the principal (Bardhan 1997).

[2] La Porta et al. (1999) hypothesize that the greater protections of property against the state embodied in common law systems, improve various aspects of government performance, including reducing corruption.

[3] Treisman (2000) argues that legal system and colonial experience are highly correlated, but also considers that the overlap is not perfect. He argues that some former British colonies or mandates do *not* have a common law legal system: for instance, Jordan, Egypt, Iraq, Kuwait, Malta and Mauritius. And some countries that were never British colonies have nevertheless adopted common law systems, in whole or in part: Thailand, Western Samoa, Liberia, and Namibia.

[4] The variables included in the models that appear in the first part of the empirical analyses are identical to Freille et al. (2007) except for the level of democracy. Since the level of democracy vari-

able was not possible to replicate from the original data, we have constructed a functional equivalent (see appendix for details).

[5] The three measures of corruption show impressive covariation (Pearsons r=.86-.97).

[6] Typically, a scatterplot of press freedom and corruption also reveals a number of outliers. Examples of countries scoring a high level of corruption and a low level of a free press using "Corruption Perception Index" from Transparency International are among others Nigeria, Myanmar, and Libya. Scoring a value of a lower level of corruption, and as well a higher level of press freedom, are countries like Italy, Zimbabwe and Jordan. Countries with low levels of corruption and a high level of press freedom are for example Finland, Canada and Austria. An outlier scoring low levels of corruption but with merely a medium level of a free press is Singapore, and an outlier with the opposite scenario – a high level of corruption but with a medium-high level of a free press, is characterized by Bangladesh.

[7] The FEVD estimation proceeds in three stages: 1) in the first stage, the procedure runs a pure FE model on the baseline model to obtain an estimate of the unit effects. 2) In the second stage, the unit effects are decomposed into an explained and unexplained part (the error term of the second stage) by regressing the unit effects on the time-invariant explanatory variables of the original model. 3) Finally, the third stage estimates the original model by pooled OLS-regression, including the time-invariant variables and the error term of the second stage (eta).

[8] A prerequisite for successfully applying FEVD is to define whether variables are time-invariant or rarely changing. Here, we apply the rule of thumb developed by Plümper and Troeger's (2007) simulations. To determine whether a variable is time-invariant, calculations are performed to obtain the quota of the between country and within country standard deviation (bw-quota; see appendix). If a greater part of the variation in an independent variable is *between* countries rather than across time *within* countries, the variable is a candidate for being defined as time-invariant. Plümper and Troeger demonstrate that the quota thresholds depend on the correlation between the independent variable and the dependent variable in the model. For independent variables where the correlation with the dependent variable is higher than .30, the variable is defined as time-invariant if the bw-quota is higher than 1.7. If correlations are higher than .50 the bw-quota threshold is 2.8, and higher than .80 the bw-quota threshold is 3.8. For independents that correlate lower than .30 the rule of thumb is to define the variable as time invariant if the bw-quota is higher than 0.2.

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APPENDIX
Variable descriptions

Name	Variable name in data set	Description	N	n	Min	Max	Mean	Std between	Std within	Corr. with TI	Corr. with HF	Corr. with WB	T & P(2007) Rule of Thumb threshold	b/w ratio	Defined as time-invariant/ time-variant
TI: Corruption Perceptions Index	ti_cpi	Corruption Perceptions Index, QoG-database: Transparency International, 1995-2009	1 553	178	0	1	0.42	.21	.04	-	-	-	-	5.14	-
HF: Freedom from Corruption	hf_corrupt	Freedom from Corruption, QoG-database: Heritage Foundation, 1994-2006	1 949	163	0	1	.40	.25	.09	-	-	-	-	2.73	-
WB: Control of Corruption	wbgi_cce	Control of Corruption, QoG-database: World Bank,1996-2007	1 653	189	-2.09	2.60	-.05	.98	.20	-	-	-	-	4.9	-
Freedom of the Press	fh_press	Freedom of the Press index, QoG-database: Freedom House, 1994-2006	2 189	188	0	100	53.53	23.99	6.35	.67	.59	.66	>2.8	3.79	Time-invariant
Freedom of the Press – Law	fh_law	Laws and regulations that influence media content, QoG-database: Freedom House,1994-2006	2 180	188	0	100	53.22	28.36	11.08	.58	.52	.58	>2.8	2.56	Time-variant
Freedom of the press – Political	fh_pol	Political pressures and controls on media content, QoG-database: Freedom House,1994-2006	2 181	188	0	100	58.73	21.39	9.78	.69	.55	.65	>2.8	2.39	Time-variant
Freedom of the press – Economic	fh_econ	Economic influences over media content, QoG-database: Freedom House,1994-2006	2 181	188	0	100	58.29	19.42	11.09	.58	.50	.57	>2.8	1.75	Time-variant
Military expenditure	wdi_me	Military expenditure (% of GDP), QoG-database: World Development Indicators, 1988-2007	1 884	156	0	72.71	2.40	2.85	1.68	-.01	.01	.01	>0.2	1.70	Time-invariant
Political rights	fh_pr	Political rights, QoG-database: Freedom House, 1972-2008	2 553	189	1	7	3.45	2.10	.60	-.59	-.52	-.61	>2.8	3.5	Time-invariant

Variable	Code	Description	N		Min	Max	Mean									Type
Freedom from government	hf_govt	Freedom from government, QoG-database: Heritage Foundation, 1994-2006)	1 949	163	0	99.13	67.14	20.76	8.68	-.52	-.28	-.39	>2.8	2.39		Time-variant
Trade	trade	The sum of exports and imports of goods and services measured as a share of gross domestic product, World Development Indicators, 1960-2009	2 347	176	.31	456.65	86.30	47.19	14.18	.19	.18	.19	>0.2	3.33		Time-invariant
Imports	imports	Imports of goods and services as % of GDP, World Development Indicators, 1960-2009	2 347	176	.12	215.27	45.77	23.76	9.05	.11	.07	.12	>0.2	2.63		Time-invariant
Fuel	fuel	% of fuel and mineral exports in merchandise exports, World Development Indicators, 1960-2009	1 912	167	0	99.74	15.57	27.36	6.13	-.22	-.07	-.19	>0.2	4.46		Time-invariant
Logarithm of real GDP	log_gdp	The logarithm of real GDP per capita PPP, World Development Indicators, 1960-2009	2 377	176	5.08	11.21	8.51	1.31	0.16	.77	.71	.76	>2.8	8.19		Time-invariant
GDP	gdp	Real GDP per capita PPP, World Development Indicators, 1960-2009	4 687	179	150.81	95434.18	9275.58	11168.35	3050.58	.83	.76	.78	>3.8	3.66		Time-variant
Energy use	wdi_eu	Energy Use (kg of coal equivalent per capita), QoG-database: World Development Indicators, 1960-2005	4 787	130	0	20140.45	2104.0	2383.75	924.92	.68	.63	.61	>2.8	2.58		Time-variant
Rule of law	wbgi_rle	Rule of Law (Estimate), QoG-database: World Bank: Governance Indicators, 1996-2007	1 689	192	-2.64	2.08	-.08	.98	.19	.93	.86	.94	>3.8	5.16		Time-invariant
Interaction Freedom of the press x Democracy over time	fh_press x afo_dem	Freedom of the press index, QoG-database: Freedom House, 1994-2006. Democracy over time, AFO, Freedom House 1972-	2 439	192	0	590.97	191.94	80.76	34.99	.76	.64	.72	>2.8	2.31		Time-variant
French colonial origin	ffc	French colonial origin (Dummy), QoG-database: Hadenius &	2 555	189	0	1	.14	.35	0	-.23	-.26	-.24			-	Time-invariant

		Teorell, 2005													
Spanish colonial origin	fsc	Spanish colonial origin (Dummy), QoG-database: Hadenius & Teorell, 2005	2 555	189	0	1	.11	.30	0	-.15	-.11	-.11		-	Time-invariant
British colonial origin	fbc	British colonial origin (Dummy), QoG-database: Hadenius & Teorell, 2005	2 555	189	0	1	.29	.46	0	-.14	.05	.01		-	Time-invariant
Ever been a colony	ever	Ever been a colony (Dummy), QoG-database: Hadenius & Teorell, 2005	2 555	189	0	1	.63	.48	0	-.46	-.34	-.36		-	Time-invariant
Parliamentary regime type	parl	Parliamentary regime type (Dummy), QoG-database: Database of Political Institutions, 1975-2006	2 072	175	0	1	.34	.47	.08	.58	.47	.54	>2.8	5.83	Time-invariant
Presidential regime type	pres	Presidential regime type (Dummy), QoG-database: Database of Political Institutions, 1975-2006	2 072	175	0	1	.57	.49	.10	-.49	-.33	-.45	>1.7	4.9	Time-invariant
Majoritarian electoral rule	dpi_plurality	Majoritarian electoral rule (Dummy), QoG-database: Database of Political Institutions, 1975-2006	1 835	161	0	1	.66	.47	.07	-.18	-.08	-.18	>0.2	6.71	Time-invariant
English legal origin	eng	English legal origin (Dummy), QoG-database: La Porta et al, 1999	2 548	188	0	1	.31	.47	0	.09	.19	.10		-	Time-invariant
Socialist legal origin	soc	Socialist legal origin (Dummy), QoG-database: La Porta et al, 1999	2 548	188	0	1	.19	.39	0	-.23	-.23	-.21		-	Time-invariant
French legal origin	fre	French legal origin (Dummy), QoG-database: La Porta et al, 1999	2 548	188	0	1	.43	.49	0	-.19	-.21	-.17		-	Time-invariant
German legal origin	ger	German legal origin (Dummy), QoG-database: La Porta et al, 1999	2 548	188	0	1	.04	.19	0	.26	.29	.28		-	Time-invariant
Scandinavian	sca	Scandinavian legal	2 548	188	0	1	.03	.16	0	.45	.33	.39		-	Time-invariant

legal origin		origin (Dummy), QoG-database: La Porta et al, 1999													
Protestant religion	pro_d	Protestant religion (Dummy), QoG-database: La Porta et al, 1980	2 509	183	0	1	.04	.19	0	.44	.33	.36		-	Time-invariant
Catholic religion	cat_d	Catholic religion (Dummy), QoG-database: La Porta et al, 1980	2 540	186	0	1	.24	.43	0	.01	.05	.10		-	Time-invariant
Democracy over time	afo_dem (DoT)	Democracy over time, AFO, Freedom House 1972-	2 555	189	.25	10	5.57	3.04	0	.66	.57	.65		-	Time-invariant

Note: The rule of thumb regarding the definition of time-invariant or time-variant variables has been applied by correlating the independent variables with the dependent variables. However, the Corruption Perceptions Index has acted as the main determinant when defining the variables as time-invariant/varian

Detailed descriptions of the press freedom and corruption indicators

Independent variables:

Acting as the independent factor in our study is consequently press freedom. The variable used portraying this factor is the press freedom measurement from Freedom House found in the QoG time-series database (version 27 May 2010). The measurement, "Freedom of the Press" is an index enclosing subcategories which are characterized by "Laws and regulations that influence media content", "Political pressures and controls on media content", and "Economic influences over media content". The legal and the economic subcategories range from 0 (more freedom) to 30 (lack of freedom), whereas the political subcategory ranges from 0 to 40. The press freedom index is computed by adding these three subcategories and thus measuring press freedom whether a country is rich or poor, or with cultural, ethnic and religious backgrounds. The variables run from 1994 until 2006. The scale ranges from 0 to 100 where 0 represents "most free", whereas 100 represent "least free". (Note that in the scatter plots, the scale is transformed so that 0 indicates "least free" and 100 "most free").

Dependent variables:

Corruption acts accordingly as our dependent variable. In total, we use three different measurements in order to capture the factor of corruption. The first variable is the "Corruption Perceptions Index" (ti_cpi) from Transparency International, found in the QoG time-series database. The index defines corruption as the abuse of public office for private gain and focuses on the public sector. The measurement is based on a survey where perceptions of the degree of corruption by business people, risk analysts and the general public are compiled. The measurement runs from 1995 until 2009 and ranges from 0 to 10 where 0 portrays "highly corrupt" and 10 indicate "highly clean". The second measurement is "Freedom from Corruption" (hf_corrupt) from Heritage Foundation, also found in the QoG time-series database. The variable relies on the "Corruption Perceptions Index" from Transparency International and measures freedom from corruption in countries that are also listed in the *Index of Economic Freedom*. In this measurement, the scale ranges from 0 (highly corrupt) to 100 (highly clean). The variable ranges from 1994-2006. The third variable measuring corruption is "Control of Corruption" (wbgi_cce). It comes from the World Bank and is additionally entailed in the QoG time-series database. The variable runs from 1996 until 2007. "Control of Corruption" is measured through perceptions of corruption defined as the exercise of public power for private gain. The variable is an estimate with the mean of 0 and a standard deviation of 1. Since the estimates are standardized each year of measurement, they are not directly suitable for over-time comparisons

within countries. Kaufmann, Kraay and Mastruzzi (2006) however find no systematic time-trends in a selection of indicators that do allow for comparisons over time, which suggests that time-series information in the WBGI scores can be used if interpreted with caution.