

Free to Expose Corruption: The Impact of Media Freedom, Internet Access, and Governmental Online Service Delivery on Corruption

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As an institution of checks and balances, free media play a vital role in curbing corruption. In addition, the global rise of Internet access and e-government increases the likelihood for corrupt public officials to be exposed. This cross-national study uses secondary data for 157 countries and examines the impact of media freedom, Internet access, and governmental online service delivery on corruption. Media freedom, Internet access, and governmental online service delivery significantly reduce corruption at the country level. While the effect of Internet access remains relatively constant across the analyzed time span from 2003 to 2013, the impact of governmental online service delivery only emerges in 2013. The study also finds a significant interaction effect between both Internet-related variables.

Keywords: corruption, media freedom, Internet access, e-government, governmental online service delivery, cross-national analysis

Corruption is a pervasive global problem with detrimental effects on economic performance, political stability, and societal integration (Hellman, Jones, Kaufmann, & Schankerman, 1999; Mauro, 1995; Nye, 1967). The United Nations Development Programme (UNDP, 2008) defines corruption as the “misuse of entrusted power for private gains” (p. 18). Current examples such as the exposure of corruption in connection with the Panama Papers emphasize the hope that free mass media, especially the Internet, may play a vital role in the process of curbing corruption. Given the growing number of Internet users, mobile Internet devices, and public online services, the potential of the Internet to fight corruption is worth detailed examination. To deepen the understanding of the relationship between traditional and

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new media and corruption,¹ this article first outlines theoretical arguments explaining the media's role in curbing corruption and specifies the significance of media freedom in this process. Then, it discusses how increased Internet access may reduce corruption. Moreover, the article argues that governments can use information and communication technologies (ICT) proactively for online service delivery and thereby fight corruption.

The study extends the existing literature in three important dimensions. First, the novel study integrates the impacts of both media freedom and developments in digital media. Especially the influence of e-governmental services on corruption has rarely been investigated empirically (see, for exceptions, Krishnan, Teo, & Lim, 2013). Second, it investigates whether Internet access and governmental online service delivery (GOSD) interact in their influence on corruption, as suggested in previous studies (Elbahnasawy, 2014). Third, the study accounts for the fast developments of digital communication technologies and investigates their effects over a period of 10 years. The longitudinal aspect has often been neglected in previous studies even though the substantial changes of media landscapes over the past decade have probably affected levels of corruption worldwide. This article tests the theoretical assumptions with a secondary analysis of data from 157 countries and compares the media's influence on corruption in three years (2003, 2008, and 2013).

The Role of Mass Media in Curbing Corruption

In modern societies, free mass media are an external factor in fighting corruption.² They can be an institution of checks and balances. As a fourth estate, the media monitor compliance with democratic laws, values, and norms. However, in contrast to the three institutionalized powers (legislative, executive, and judicial bodies), mass media have no formal means to sanction misconduct by corrupt public officials; therefore, they exert their public control indirectly (Stapenhurst, 2000). They perform this role in six main ways.

First, as watchdogs, the media hold political decision makers accountable for their actions (Norris, 2004). By this, media can help "the prosecutorial institutions by investigating and reporting incidences of corruption" (Camaj, 2012, pp. 2-3), leading to investigations by official bodies and convictions of corrupt political actors. When institutionalized control powers fall prey to corruption themselves and cannot effectively enforce penalties, independent and critical media often perform their role as a regulatory body more efficiently than the legislative, executive, and judicial bodies (Stapenhurst, 2000). By exposing corrupt public officials, mass media contribute to vertical accountability, which Schedler (1999) describes as a control mechanism between powerful superior and less powerful inferior actors. For instance, in the immediate aftermath of the Panama Papers revelations, the prime minister of Iceland, Sigmundur Davíð Gunnlaugsson, was forced to resign after public protests. This example shows that the media can have a relevant impact when civil society demands accountability from elected leaders. The media are more likely

¹ Corruption occurs in both the private and the public sectors (Argandoña, 2003). This article will focus on corruption in the public sector.

² Brunetti and Weder (2003) further consider internal factors within organizations (e.g., meritocracy and promotion) and indirect factors (e.g., culture) to explain corruption.

to affect private-to-public corruption because public outrage puts the reputation of elected officials at stake. Actors in the private sector, however, are far less dependent on public approval, and private-to-private corruption is therefore less likely to be affected by critical media coverage (Argandoña, 2003).

Second, mass media strengthen checks and balances between equally powerful actors (horizontal accountability; Camaj, 2012). By exposing flaws in anticorruption bodies, journalists can call for reform of these institutions and thereby increase the media's effectiveness in fighting corruption (Stapenhurst, 2000). In addition, raising public awareness about the proceedings of control mechanisms through media coverage reinforces the work and legitimacy of the state's anticorruption bodies, strengthening the institutional design of the political system, which is considered "the ultimate determinant of corruption" (Lederman, Loayza, & Soares, 2005, pp. 10–11).

Third, mass media provide a civic forum for voicing complaints and contribute to forming public opinion. By "highlighting policy failures, maladministration by public officials, corruption in the judiciary and scandals in the corporate sector" (Norris, 2004, p. 119), the media can generate public pressure to force corrupt politicians to resign and to lose political power. These naming and shaming campaigns influence the reputation of a corrupt actor and can increase law compliance (Fisman & Miguel, 2008). These measures are especially effective in the fight against extortive corruption, which relates to incidences when "the government official has the discretionary power to refuse or delay a service . . . in order to extract a rent from the private agent in the form of a bribe" (Brunetti & Weder, 2003, p. 1804). In this case, the victim has an interest in exposing the corrupt official. However, when both the bribing and receiving actors profit from the corrupt transaction (collusive corruption; Brunetti & Weder, 2003), no participant is interested in prosecuting the case. This calls for investigative media to actively engage in anticorruption efforts.

Fourth, by providing information about corruption, mass media contribute to a general climate of transparency within the society, which curbs corruption on both the systemic and individual levels (Kolstad & Wiig, 2009; Lindstedt & Naurin, 2010). However, transparency alone is insufficient to reduce corruption. Widespread access to information needs to be accompanied by the "ability to process the information, and the incentives to act on the processed information" (Kolstad & Wiig, 2009, p. 524). Therefore, some scholars take a more critical approach regarding the relationship between the news media and corruption. Vaidya (2005) presents empirical evidence showing that the "government's ability to 'spin' the media allegations can undermine corruption deterrence" (p. 667).

Fifth, watchdog media can have a preventive effect (Stapenhurst, 2000). Deterrence theory identifies three forces that are expected to increase the frequency and magnitude of corruption: (a) high magnitude of external rewards, (b) low probability of detection, and (c) low severity of punishment (Becker, 1974). If the media fulfill their watchdog role, there is an increased likelihood for incumbents' misconduct to be exposed and for them to suffer criminal prosecution or a loss of reputation or power. Thus, the personal benefit of corruption decreases, and potential perpetrators are deterred from engaging in corruption in the first place. However, to successfully deter corruption among public officials, media exposure, strict anticorruption laws, and effective prosecution from strong institutions of justice need to

complement one another. If officially sanctioned institutions are weak or even corrupt themselves, potential perpetrators do not have to fear punishment (Persson, Rothstein, & Teorell, 2013).

Sixth, Stapenhurst (2000) also identifies intangible ways in which media can contribute to fighting corruption. These are

those checks on corruption which arise from the broader social climate of enhanced political pluralism, enlivened public debate and a heightened sense of accountability among politicians, public bodies and institutions that are inevitably the by-product of a hard-hitting, independent news media. (pp. 2–3)

Empirical studies support this claim by showing that information supply has a positive impact on government responsiveness (Besley & Burgess, 2002) and accountability (Khazaeli & Stockemer, 2013) and that public access to information is a powerful deterrent of local capture (Reinikka & Svensson, 2004). Moreover, journalists can raise awareness of problems associated with corruption and shape social norms about prevalence and moral evaluation of corrupt behavior within societies. Empirical evidence highlights the importance of a general anticorruption culture (Fisman & Miguel, 2008), corruption awareness (Goel, Nelson, & Naretta, 2012), and perceived social norms (Köbis, van Prooijen, Righetti, & van Lange, 2015) as important means to fighting corruption.

However, despite the media's potential to curb corruption, they are often restricted to bolstering government accountability for citizens. The media often "serve to reinforce the control of powerful interests and governing authorities" (Norris, 2004, p. 121). For journalists to expose corruption, media must be free from legal, political, and economic constraints (Freedom House, 2015). However, media freedom is a fragile commodity, often abolished by totalitarian states, and, even in democratic countries, it can be suppressed in times of crisis (Dosenrode, 2010). Restrictions can occur both directly through censorship, prosecutions, or press concentration and indirectly through self-censorship. Physical violence against and intimidation of journalists often have general deterring effects, resulting in self-censorship by investigative journalists (Dosenrode, 2010).

The empirical relationship between press freedom and corruption is well documented (Kalenborn & Lessmann, 2013; Norris, 2004). Several studies indicate that a high level of press freedom leads to a low level of corruption in a country. Freille, Haque, and Kneller (2007) examine the relationship between media freedom and corruption in further detail by distinguishing political, legal, and economic constraints. Their results suggest that political restrictions most strongly affect corruption, whereas legal constraints have weaker impacts. Yet, the existence of freedom of information legislation (FOIL) is also associated with less corruption (Islam, 2006). Furthermore, the relationship between media freedom and corruption is stronger in countries that have adopted FOIL (Nam, 2012). With regard to political constraints, Camaj (2012) finds that "the association between media freedom and corruption is strongest in countries with parliamentary systems than in those with presidential systems" (p. 1). In addition, the media's economic independence and media competition contribute to the fight against corruption (Suphachalasai, 2005). Djankov, McLeish, Nenova, and Shleifer (2003) find a strong correlation between government ownership of media and corruption. However, foreign ownership of the press is associated with lower levels of

corruption because it increases transparency and deters political actors from engaging in corrupt activities (Besley & Prat, 2006).

Cross-sectional studies cannot find evidence of causality between media freedom and corruption. However, longitudinal analyses and statistical Granger tests indicate that media freedom causes a decrease in corruption and not vice versa (Ahrend, 2002; Brunetti & Weder, 2003). Based on these theoretical arguments and empirical evidence, we hypothesize:

H1: Media freedom has a negative influence on corruption.

Limiting Corruption Through Increased Internet Access

As an important ICT, the Internet is "a cost-effective and convenient means to promote openness and transparency and to reduce corruption" (Bertot, Jaeger, & Grimes, 2010, p. 264). We argue that Internet access impacts corruption in three major ways.

First, because the Internet is more difficult to censor and control than traditional media, it may circumvent restricted traditional media and reduce corruption by altering public access to information about corrupt public officials (Goel et al., 2012). The Internet also makes it easier for investigative journalists to publish misconduct by public officials anonymously. By decreasing the risk of prosecution and physical harm, journalists can bypass self-censorship and enable others to access information online.

Second, aside from the Internet's allowing access to professional journalistic information, the onset of social media over the last decade has created new opportunities to accelerate the dissemination of information by amateurs. Citizen journalists, political bloggers, and lay communicators add to the variety of information sources and can create transparency (Bertot et al., 2010). Thus, social media have the potential to uncover corruption even when traditional media fail to do so. Sullivan (2013) points out that "netizen-led initiatives have facilitated the mobilization of online public opinion and forced the central government to intervene to redress acts of lower level malfeasance" (p. 24). For instance, bloggers "routinely uncover corruption, help solve social problems, and even pressure state officials to change policy" (Hassid, 2012, p. 212). Furthermore, social networking sites (SNS) such as Facebook and Twitter can be used to organize offline demonstrations against corrupt political actors, as it did during the Arab Spring in 2011 (Tufekci & Wilson, 2012). The emergence of civic technology movements such as ipaidabribe.com, bribespot.com, sunlightfoundation.com, and others are dedicated to anticorruption efforts. By providing platforms to aggregate data about single acts of corruption, they help to foster transparency and to pressure corrupt actors into resigning their public offices.

Third, the potential of the Internet for the spreading of information about corruption allows Internet users to gain access to more diverse, independent, and foreign media sources. This increases the risk of detection for political actors (Andersen, Bentzen, Dalgaard, & Selaya, 2011). According to deterrence theory, this should have a preventive effect, deterring them from engaging in corruption in the first place (Becker, 1974).

Surely, however, Internet access alone is an insufficient means to relevant information about corruption. It has to be accompanied by users' interest in information about corruption, their abilities to process it adequately, and their motivation to act on perceived injustice. Some scholars question the effectiveness of the Internet to allow users to apply public pressure as a whole. They often refer to the fragmentation hypothesis and "argue that much online interaction simply involves the meeting of 'like-minded' individuals, leading to a fragmented public sphere of insulated 'deliberative enclaves' where group positions and practices are reinforced rather than openly critiqued" (Dahlberg, 2007, p. 828). Others claim that in countries with limited media freedom, social media can only contribute to curbing corruption when no interests of high political elites are at stake (Toepfl, 2011). MacKinnon (2007) concludes:

Forums, chatrooms and blogs . . . [allow] enough room for a sufficiently wide range of subjects that people can let off steam about government corruption or incompetence, thus giving people more things to do with their frustrations before considering taking their gripes to the streets. (p. 33)

Several empirical studies have examined the impact of the Internet on corruption. Even though the studies use slightly different measures (e.g., Internet adoption, Internet diffusion, Internet use), the results suggest the importance of Internet access to reduce corruption. Furthermore, Internet use increases transparency and accountability (Khazaeli & Stockemer, 2013; Relly, 2012). Empirical research further suggests that high levels of Internet adoption and Internet diffusion are associated with low levels of corruption (Andersen et al., 2011; Elbahnasawy, 2014; Lio, Liu, & Ou, 2011). In addition, corruption awareness on the Internet is significantly correlated with corruption measures (Goel et al., 2012). The corruption-reducing effect of the Internet, however, is relatively small (Elbahnasawy, 2014; Lio et al., 2011). Based on the theoretical considerations and previous empirical findings, we hypothesize:

H2: Internet access has a negative influence on corruption.

Limiting Corruption Through Governmental Online Service Delivery

Governments can also use ICT for the delivery of public services. *E-government* is the "public sector use of the Internet and other digital devices to deliver services, information, and democracy itself" (West, 2005, p. 1). At all levels of government, ICT can be applied to provide information and public services to citizens more easily and affordably. Although empirical literature is limited, several arguments emphasize that e-government may both limit the risk of corruption in the public sector and contribute to uncovering it.

E-government includes making data and information produced or commissioned by public bodies free to use, reuse, and redistribute. This is often referred to under the term *open (government) data* (Organisation for Economic Cooperation and Development [OECD], 2015). E-government efforts in general and open government data in particular are intrinsically related to freedom of information laws (FOIL). Open data refers to information about money flows, public procurement, management of public funds, and recruitment for public jobs. Accessibility to such data enables journalists, prosecutors, and actors from the civil society to process and verify information about inefficient financial activities and

potential conflicts of interest and about lobby affiliations of office holders. Reused and redistributed government data may provide necessary evidence when reporting on incidences of corruption. Furthermore, open data enhance the expertise of media and public actors when they engage in political discourse and give feedback to authorities (Goodrich, 2015; Granickas, 2014; Izdebski, 2015).

Beyond the benefits of open data, e-government is assumed to curb corruption by enhancing interaction among political institutions and between the government and civil society. This interaction expands communication channels for public administration and enables collaborative public governance (United Nations [UN], 2014). E-government limits the relevance of bureaucrats as intermediaries and grants access to public services without (or with limited) interaction between potentially corrupt actors. Additionally, the required standard procedures necessary in the delivery of every digital service show transparent rules and reduce arbitrary case-by-case decision making by potentially corrupt actors. They also reduce discretion about procedures because detailed data about transactions are tracked and stored, increasing the chances to expose acts of corruption (Andersen, 2009; Andersen et al., 2011; Bhatnagar, 2003). Furthermore, enabling the participation of citizens, e-government may support civil society and interest groups in their efforts to collaborate on designing policies to prevent corruption. This might also further co-responsibility of citizens in the fight against corruption (G20, 2015).

Empirical evidence on the impact of e-government to reduce corruption is scarce. However, Andersen (2009) shows in a secondary analysis of the years 1996 to 2006 that the increase of Internet-based e-government features on national websites resulted in a decrease of corruption in non-OECD countries. Krishnan and colleagues (2013) and Elbahnasawy (2014) find that e-government maturity and e-government readiness reduce corruption on the macrolevel. Furthermore, Elbahnasawy (2014) argues that an interaction effect exists between e-government readiness and Internet adoption. Both are complements in the fight against corruption and can develop their full potential if they appear together because extensive online service delivery is worthless if few citizens can actually access those services. We therefore postulate:

H3: Governmental online service delivery has a negative influence on corruption.

H4: Governmental online service delivery and Internet access interact in their negative influences on corruption.

Long-Term Effects

Because of the emergence of technological Internet innovations such as SNS, blogs, mobile Internet, and apps, information has become more available via the Internet over the last decade. Amateur video uploads from eye witnesses, political blogs, and citizen journalism have developed as new sources of information. Because of their global reach, SNS and microblogging sites provide new means to access and further spread information to apply public pressure to corrupt public officials. Using data from 1995 to 2005, Lio et al. (2011) conclude: "Our findings suggest that the internet has shown a capacity for reducing corruption, but its potential has yet to be fully realized" (p. 47). Hence, we postulate:

H5: The negative influence of Internet access on corruption increased from 2003 to 2013.

Similarly, the online availability of governmental information and services also significantly increased during the last decade on a global scale (UN, 2004, 2014). During that timeframe, many countries adopted FOIL, which further contributed to more government transparency and decreased the potential for corruption to occur (Islam, 2006; Nam, 2012). In addition, e-government strategies professionalized to address citizens who in turn got more and more used to Internet transactions as part of formalized practice (e.g., online tax declaration). Thus, we postulate:

H6: The negative influence of governmental online service delivery on corruption increased from 2003 to 2013.

Method

Overview and Sample

To test the hypotheses, we conducted a cross-national analysis of secondary data. Overall, 159 countries were included in the final samples: 123 countries for the year 2003, 155 countries for 2008, and 157 countries for 2013. Following the systematization of the UN (2016), the samples consisted of 50 countries from the African Group, 40 countries from the Asia-Pacific Group, 22 countries from the Eastern European Group (EEG), 24 countries from the Latin American and Caribbean Group (GRULAC), and 23 countries from the Western European and Others Group (WEOG) (see list of countries in Appendix 1).³ A comparison of the mean values of key variables in the countries in our sample and the mean values of the 193 UN member states in 2013 shows only a slight bias. The gross national income per capita (GNI) is \$16,438 versus \$16,693 USD; life expectancy is 69.9 versus 70.7 years; media freedom is 49.3 versus 52.5 points (Freedom House, 2015; UNDP, 2015).

Measures

Corruption. Similar to other cross-national analyses (Camaj, 2012; Freille et al., 2007), we apply the Corruption Perception Index (CPI) to measure corruption. Since 1995, the nongovernmental organization Transparency International (TI) annually publishes the index. It consists of perception-based data about corruption and covers up to 183 countries. According to TI (2013), the CPI uses "13 different data sources from 12 different institutions that capture expert perceptions of corruption within the past two years" (para. 2). A study by Lederman et al. (2005) shows strong correlations between the CPI and other available corruption indices. Even though Olken (2009) finds differences between corruption perception and corruption reality, we rely on the CPI as the best proxy to measure corruption. Because most corrupt actions are hidden from plain sight, a more direct observation is hardly possible, and self-

³ In terms of the distribution of countries over the groups, our sample differs only slightly from the distribution of the UN: 31% of the sample belongs to the African Group versus 28% of all UN countries belonging to the African Group, 25% versus 28% to the Asia-Pacific Group, 14% versus 12% to the EEG, 15% versus 17% to the GRULAC, and 14% versus 15% to the WEOG.

reported data on corrupt behavior is assumed to be biased by social desirability. The CPI is measured on a scale from 0 to 100. Original scores were reversed so that high scores represent high levels of corruption. Since the scales differed to a large extent, the CPI and all other variables have been z-score standardized for the statistical analyses.

Media freedom. Information on media freedom was derived from the Press Freedom Index (PFI) by Freedom House (2015). It comprises legal (e.g., FOIL), political (e.g., censorship), and economic (e.g., media concentration) restrictions. The index is widely used by politicians, academics, and journalists; includes multiple forms of media (newspapers, television, radio, Internet); and is highly correlated to other indices measuring media freedom (e.g., International Research and Exchanges Board; Reporters without Borders; Becker, Tudor, & Nusser, 2007). It has been applied in and recommended for cross-national analyses with a global scope (Camaj, 2012; Schneider, 2014). Each country receives a score from 0 to 100. Original scores were reversed so that high scores represent a free media system. Considering the specific aim of this study, we find it necessary to mention that the subindex for political restrictions contains a question regarding media access and therefore slightly overlaps with the Internet access variable. However, the question is primarily aimed at traditional media and accounts for, at most, 4 of 100 points of the media freedom score.

Internet access. Data to measure Internet access stem from the International Telecommunication Union (ITU). Data are available for more than 200 countries and "are collected from an annual questionnaire sent to official economy contacts" (ITU, 2015). We used the standardized values of the following three variables to form a mean index of Internet access: percentage of Internet users, total number of secure Internet servers, and broadband access per 100 inhabitants. For all three years, the indices show high internal consistency (2003: $\alpha = .83$; 2008: $\alpha = .92$; 2013: $\alpha = .87$).

Governmental online service delivery (GOSD). To gauge the degree of GOSD, we used the United Nations E-Government Survey involving the 193 UN member states. More specifically, we used the Online Service Index (in 2003 and 2008, the index was called Web Measure), which is a subindex of the E-Government Readiness Index. The Online Service Index is an empirical assessment of online information and services available through official governmental websites (UN, 2014, pp. 191-196). It assesses whether citizens can obtain updated information on government, laws, public policy, and so on. It also measures whether downloadable forms for governmental services are available, whether the website is multilingual, whether it uses multimedia features, and whether the government provides interactive tools to integrate citizens in decision-making processes. Furthermore, the availability of financial and nonfinancial transaction services is measured. The standardized index ranges from 0 to 1, with high values indicating high degrees of GOSD. For good reasons (but unfortunate for an empirical investigation of the long-term effects of GOSD), the measurement of the Online Service Index has been slightly adapted over the years. It was expanded to reflect current trends in available information and applications. This seems reasonable because e-government strategies undergo a continuous development and do not contain fixed sets of tools. However, long-term effects need to be interpreted with caution.

Controls. The insertion of control variables is based on prior empirical findings. We distinguish between economic, social, and political development. Studies have found that the level of economic

development correlates with corruption (Mauro, 1995; Treisman, 2000), leads to improvements in free speech (Norris & Zinnbauer, 2002), and is a crucial determinant of Internet access (Amiri & Reif, 2013) and of e-government initiatives (UN, 2014). The measure of economic development was adopted from the Human Development Index (HDI). The UNDP (2015) annually measures the GNI in 174 countries. Educational level has been shown to be connected to institutionalized media freedom (Norris & Zinnbauer, 2002). Lindstedt and Naurin (2010) find that media freedom can exert its influence on corruption only when it is accompanied by a high level of public education. Several researchers provide support for the assumption that life expectancy and further indicators of social well-being correlate to media freedom (Tran, Mahmood, Du, & Khrapavitski, 2011). We used the subindices of education (comprising mean years of schooling per country and literacy among adults) and life expectancy at birth (in years) of the HDI to measure social development. The education index ranges from 0 to 1, with high values indicating high levels of social development.

To gauge political development, we derived data for the quality of democracy in a country from Polity IV (Camaj, 2012; Kalenborn & Lessmann, 2013; Khazaeli & Stockemer, 2013). The database operationalizes regime types according to a minimal definition of democracy (Jagers & Gurr, 1995). The scale ranges from -10 = autocratic to $+10$ = democratic based on the "presence of institutions and procedures through which citizens can express effective preferences about alternative policies and leaders", the "existence of institutionalized constraints on the exercise of power by the executive", and "the guarantee of civil liberties to all citizens in their daily lives and in acts of political participation" (Marshall & Jagers, 2007, p. 13).

The descriptive statistics of the corruption measure and the predictor variables can be found in Table 1.

Table 1. Descriptive Statistics of Corruption and the Predictor Variables.

Measures	2013		2008		2003	
	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>
Corruption	177	57.3 (19.9)	180	59.7 (21.1)	131	57.5 (22.9)
Media freedom	196	52.5 (23.6)	195	53.3 (24.5)	193	55.0 (25.4)
Percentage of Internet users	208	43.9 (29.4)	211	29.1 (26.5)	201	17.1 (20.8)
Broadband (per 100 inhabitants)	209	11.4 (12.8)	208	7.9 (11.0)	198	1.9 (4.1)
Secure Internet servers	200	348.3 (859.4)	189	194.4 (417.3)	145	72.9 (155.7)
Governmental online service delivery	193	0.5 (0.3)	192	0.3 (0.23)	190	0.3 (0.2)

Results

For each year under investigation, we computed hierarchical OLS regression models to test the hypotheses. A test for multicollinearity revealed that the variance-inflation factor (VIF) values were below the cutoff criterion of 10, indicating acceptable levels of multicollinearity (Lindstedt & Naurin, 2010).

In total, the regression model for the year 2013 explains 79% of the variance in corruption ($R^2 = 0.794$; $p < .001$, Table 2). The set of control variables explains 68% of the variance in the dependent variable. By inserting the independent variable *media freedom*, the explained variance of the model significantly increases by 6.2% ($\Delta R^2 = 0.062$, $p < .001$). The significant negative effect of media freedom supported the assumptions of H1. In a third step we inserted the independent variable *Internet access*, which leads to a change in R^2 of 0.036 ($p < .001$). The significant negative impact of Internet access on the CPI score supports H2. By inserting *governmental online service delivery (GOSD)*, the regression model additionally explains 0.9% ($\Delta R^2 = 0.009$, $p = .012$) of the variance in corruption. In line with H3, the better the availability of information and services provided by the government, the lower the level of corruption. Looking at the beta values, we then find that the negative effect of media freedom ($\beta = -0.360$, $p < .001$) is higher compared to the impact of Internet access ($\beta = -0.276$, $p = .009$) and the effect of the GOSD ($\beta = -0.171$, $p = .001$). Similar to previous empirical findings (Treisman, 2000), the GNI ($\beta = -0.238$, $p < .001$) of a country significantly influences the degree of corruption.

H4 assumed an interaction effect between Internet access and GOSD. In a fifth step, we added the interaction variable to the regression model, which additionally explains 1% of the variance in corruption ($\Delta R^2 = 0.010$, $p = .009$). Because of the significant negative impact of the interaction effect in the regression model on corruption, we accept H4.

To test if the effect of Internet access increased from 2003 to 2013 (H5), we computed two additional hierarchical OLS regression models for the years 2003 and 2008, following the same procedure as explained earlier (Table 2). For all years we find a significant negative influence of Internet access on corruption. However, comparing the B coefficients for each year, we find that the effect increased from 2003 ($B = -0.707$, 95% CI [-1.070, -0.345]) to 2008 ($B = -0.876$, 95% CI [-1.068, -0.683]) but decreased from 2008 to 2013 ($B = -0.346$, 95 % CI [-0.604, -0.087]). Because the confidence intervals of B for 2003 and 2008 overlapped, we could not assume a significant increase of the effect of Internet access over that time span. However, the confidence intervals of B for 2008 and 2013 did not overlap, indicating that the impact of Internet access on corruption even decreased over time.⁴ This finding partly contradicts the assumptions of H5, which we consequently reject.

⁴ To test H5 and H6, we also conducted the same analysis using only those 120 countries for which data were available for all three years (2003, 2008, 2013). Although the B coefficients and confidence intervals slightly differ, the analysis did not reveal any different results in terms of statistical significance. Therefore, the effects cannot be attributed to the different samples.

Table 2. Hierarchical OLS Regression Analyses Predicting Corruption^a for 2013, 2008, and 2003.

Predictor	2013		2008		2003	
	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1	0.677***		0.596***		0.692***	
Democracy ^b		0.026		0.107		0.193*
GNI ^c		-0.238***		-0.166*		-0.480***
Education ^d		-0.001		0.123		0.127
Life expectancy ^e		-0.007		0.005		0.028
Step 2	0.062***		0.087***		0.039***	
Media freedom ^f		-0.360***		-0.238**		-0.230**
Step 3	0.036***		0.142***		0.097***	
Internet access ^g		-0.276**		-0.718***		-0.555***
Step 4	0.009*		0.002		0.000	
GOSD ^h		-0.171**		-0.082		-0.015
Step 5	0.010**		0.002			
Internet access \times GOSD		-0.126**		0.060	0.000	0.050
Adjusted R^2	0.782***		0.820***		0.816***	
N	157		155		123	

Note. OLS = ordinary least squares. All variables are z-score standardized. ^aCorruption Perception Index. Higher values indicate more corruption. ^bPolity IV Index. Higher values indicate more democracy. ^cGross national income per capita. ^dMean index measuring mean years of schooling and literacy among adults. ^eIn years. ^fPress Freedom Index. Higher values indicate more media freedom. ^gMean index measuring percentage of Internet users, total number of secure Internet servers, and broadband access per 100 inhabitants. ^hOnline Service Index. Higher values indicate more governmental online service delivery. * $p < .05$; ** $p < .01$; *** $p < .001$.

H6 assumed that the impact of the GOSD increased from 2003 to 2013. Following our testing procedure for H5, we compared the effects of all three regression models (Table 2). For the years 2003 ($\Delta R^2 = 0.000$, $p = .788$) and 2008 ($\Delta R^2 = 0.002$, $p = .201$), our results show no significant change in R^2 when GOSD was inserted in the respective regression model. For the year 2013, however, we find a small significant negative impact supporting H6. We accept H6.

Discussion

In accordance with previous findings, the results of this cross-national study show a strong and consistent relationship between media freedom and corruption on the country level in three different years. Thus, the study supports hopes that free media fulfill their tasks to hold public officials accountable, to create a more transparent society, to deter corrupt actors from illegal action by increasing the risk of detection, and to reinforce anticorruption laws. The results also support less researched assumptions:

Internet access and online delivery of public information and services impact corruption negatively. This suggests that access to the Internet makes citizens less dependent on traditional intermediaries such as newspapers and broadcasting. A possible explanation for this finding is that independent news outlets on the Internet (e.g., blogs, citizen journalism, SNS) "produce the type of content that is necessary for accomplishing the social functions formerly filled by newspapers" (Siles & Boczkowski, 2012, p. 1380). This applies also to the watchdog function of the media. The public pressure that Internet exposure can create might become a powerful deterrent in itself. The example case of the former German federal president Christian Wulff illustrates that the defamatory power of media, especially social media, may force politicians to resign even though they are legally acquitted. Yet, the enforcement of personal consequences for the corrupt actor probably depends on the prevalent degree of corruption in the respective country. However, this example also shows that the defamatory power of media is a double-edged sword, as it highlights the potential by-products of hard-hitting journalists and social media users. By pointing their fingers at single individuals based on questionable evidence, such naming and shaming campaigns can quickly lead to public prejudgments and corresponding harsh personal consequences for the accused.

Enabling public access to government data both increases public knowledge and provides evidence of irregularities, inefficiencies, and dubious money flows. Providing electronic public services to citizens, businesses, and other government agencies online reduces the necessity of face-to-face encounters between citizens and public officials. It also limits opportunities for potentially corrupt public officials to propose or extort bribes. Official government procedures become more transparent and easier for citizens to understand and can potentially be enforced by legal action. This mechanism is most effective when large parts of the population actually have the means to access the information and services. The significant interaction effect between Internet access and governmental online service delivery reveals that both factors complement each other in the fight against corruption.

We conclude that in the midst of the academic debate, whether the Internet fosters democratization or rather strengthens autocratic regimes by "imposing further restrictions on political and social liberties" (Rød & Weidmann, 2015, p. 339), the empirical evidence of this study supports the assumption that the Internet seems to be an important means to reduce corruption.

Due to the rapid global increase of Internet access over the last decade and the emergence of new technologies such as social media, we assumed that the effect of Internet access on corruption would increase over time. However, our results show that the size of the negative impact is relatively stable and has instead decreased from 2008 to 2013. Due to the rather large time interval, we need to interpret longitudinal results with caution. A possible explanation for this finding is that the potential impact of social media may have been overestimated when they first emerged. It could be argued that the expectations about the power of social media alone deterred public officials from engaging in corruption because they feared exposure on a large scale. Over the years, however, the Internet may not have lived up to the high expectations so that its deterring impact on corruption decreased. Additionally, autocratic and corrupt regimes may have learned how to use the Internet to their advantage by imposing further restrictions, managing public outrage, and defusing accusations of corruption (MacKinnon, 2007; Rød & Weidmann, 2015; Toepfl, 2011). Hassid (2012) uses the metaphor of a safety valve to describe the

process that regimes use to allow citizens to let off steam via the Internet without endangering the established corrupt structures.

We also expected that the negative effect of governmental online service delivery would increase over time. Governmental online service delivery had no effect on corruption in 2003 and 2008, but it exerted a significant negative impact on corruption in 2013. We argue that governmental online service delivery was too limited globally in the first years of our analysis to contribute meaningfully to the fight against corruption. FOIL spread widely during the investigated time span. These improvements in the legal framework might very well be linked to the increasing accessibility of governmental online services, leading to a broader range of open data, and might bring along increased anticorruption means (Islam, 2006; Nam, 2012). Not only did the supply of e-government increase over the last years (UN, 2004, 2014), but people also learned how to benefit from those services and adopted them in their daily practice.

This article provides theoretical arguments for why access to the Internet might contribute to lower levels of corruption within countries, but the empirical analyses reveal neither which specific aspects account for this impact nor conclude to what degree the impacts occur. Future research is needed on the factors that supposedly shape the role of new technologies in reducing corruption and on the relative importance of these factors to each other. This could include research on how access to professional journalistic content and to personal information in social media determines corruption. Because of a lack of comparative data, the role of social media has been neglected in cross-national empirical research on corruption so far. Additionally, the potential of new technologies to mobilize citizens for public protest and the emergence of civic technology movements need further attention. The impact of civic technology movements such as the Sunlight Foundation or the Open Knowledge Foundation on corruption is barely researched. Websites such as ipaidabribe.com and bribespot.com encourage citizens to report personal encounters with and instances of corruption. Future analyses are needed to assess implications of such initiatives on corruption and to understand the role of the Internet to shape societal norms about corruption. Apart from that, future research on media effects might want to distinguish between different forms of corruption as the dependent variable, for example, between public and private corruption (Argandoña, 2003) or individual and interpersonal corruption (Köbis, van Prooijen, Rhighetti, & van Lange, 2016). It can be assumed that ICT plays different roles in these contexts. To zero in on the potential effects of media on corruption, other intervening variables explaining corruption on the macrolevel, such as the political economy of the media, different political systems, the general level of journalistic professionalism, and the level of technological development, need to be considered. However, for many important control variables, comparative data with global scope are lacking.

The study has some limitations. As in most cross-national and longitudinal analyses, data availability is limited, forcing researchers to a small set of measures of the relevant constructs. This also includes using "highly aggregate indexes from different sources" (Camaj, 2012, p. 17) and secondary data, some of which were not primarily collected for academic purposes. In addition, key variables such as the PFI and the CPI suffer from potential bias because they rely on perception-based data, and the CPI does not explicitly account for instances when the media themselves fall prey to corruption. Yet, data from

the Global Corruption Barometer show that respondents in 100 countries rate the media as substantially less corrupt than, for example, political parties, parliament, public officials, or the judiciary (TI, 2011).

To draw profound conclusions about long-term effects, the statistical analyses require further points of measurement in shorter time intervals. Thus, our results serve as a starting point to understand how media and especially the Internet affect corruption over time.

Although the levels of multicollinearity in the data are acceptable, they are still rather high, which may bias the effects attributed to each variable (Lindstedt & Naurin, 2010). Therefore, we refrained from interpreting the effect sizes in comparison to each other. The chosen strategy of analysis provides us with a conservative hypothesis test. Any influence of the independent variables that shares variance with the control variables cannot be detected statistically. However, the significant influences of media freedom, Internet access, and governmental online service delivery are not overestimated and display only those effects that go beyond general principles of democratic governance and economic and social well-being.

The global fight against corruption demands collective efforts to weaken corrupt behavior, uncover wrongful doings, and track legal prosecution. The media can support this goal significantly. As with many other societal challenges, the importance of media freedom cannot be overestimated in the fight for better governance. The developments of ICT add further promising instruments against corruption. Thus, providing the technological infrastructure and the socioeconomic means for citizens to access the Internet should receive considerable recognition in political decision making. Decreasing technological barriers and the increase in mobile Internet devices hold great potential in ensuring Internet access for an increasing number of citizens on a global scale. Policy makers would be well advised to supply further resources to implement e-government at all governmental levels as a cost-efficient and influential means in the fight against corruption.

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Appendix

Appendix 1. Countries Used for Statistical Analyses

Albania, Algeria, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahrain, Bangladesh, Belarus, Belgium, Benin, Bhutan, Bolivia, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Central African Republic, Chad, Chile, China, Colombia, Comoros, Congo (Democratic Republic), Congo (Republic), Costa Rica, Côte d'Ivoire, Croatia, Cuba, Cyprus, Czech Republic, Denmark, Djibouti, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Libya, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Montenegro, Morocco, Mozambique, Myanmar, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russia, Rwanda, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, South Africa, South Korea, Spain, Sri Lanka, Sudan, Suriname, Swaziland, Sweden, Switzerland, Syria, Tajikistan, Tanzania, Thailand, Timor-Leste, Togo, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Uzbekistan, Venezuela, Vietnam, Yemen, Zambia, Zimbabwe