مجلة جامعة الشارقة للعلوم الإنسانية والاجتماعية

اسم المقال: الحصول على المعلومات الحكومية وتأثيرها على الفساد الحكومي
اسم الكاتب: عبدالرحمن أحمد عبدالرحمن
رابط ثابت: https://political-encyclopedia.org/index.php/library/9151
تاريخ الاسترداد: 2026/11/01 19:03 +03

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جامعة الشارقة
UNIVERSITY OF SHARJAH

University of Sharjah Journal

A Refereed Scientific journal

of

Humanities & Social Sciences



Issue B

Vol. 18, No. 2
Jumada 1 1443 A.H. / December 2021 A.D.

ISSN : 1996 - 2339

University of Sharjah Journal for Humanities & Social Sciences, Volume 18 No. 2 (A) December 2021
https//:doi.org/10.36394/jhss/18/2B/2

Access to Government Information and Government Corruption: An Empirical Investigation

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Received on: 02-02-2020 **Accepted on: 06-06-2020**

Abstract:

This study aims to investigate the effect of public access to and use of government information on government corruption. Methodologically, the study uses a multivariate regression model to assess this impact. Adopting a cross-sectional model, the study draws on cross-country data. The study also draws on a few cases at the micro level with a view to corroborating the findings based on the multivariate regression model. Furthermore, the study is designed to redress the methodological problems that are commonly encountered in cross-sectional regression models used in empirical investigation into the causes of corruption (e.g., multicolinearity and heteroscedasticity).

Three principal findings emerge from the study. First, access to government information reduces corruption at both the micro and macro levels. Second, a supporting institutional and political environment is a sine qua non of the effectiveness of access to government information as an anti-corruption policy tool. Third, public access to traditional media (e.g., TV, radio, mobile phones, etc.) is an effective policy tool for curbing corruption, particularly in contexts characterized by limited computer and Internet penetration in society. For developing countries, the policy implication is that this access may have to be an important component of anti-corruption policy initiatives.

Keywords: Access, Government Information, Corruption.

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Introduction:

Government corruption is seen to impede poverty eradication, economic growth, sustainable development, and good governance. Individual researchers, domestic and international civil society organizations, official multilateral lenders, and national governments have all taken keen interest in combating corruption. Efforts to curb corruption have included, inter alia, the establishment of anti-corruption agencies and the enactment of anti-corruption laws, including the right to information laws.

As corruption continues to plague numerous countries, particularly in the developing world, the quest for what curbs corruption continues. Numerous factors have been suggested as influencing government corruption, most notably e-government and transactional e-government in particular. However, e-government has some serious limitations, discussed below, in the context of developing countries.

One factor that has the potential to influence the level of corruption is access to and use of government information. However, the impact of this factor on corruption is rarely investigated. Yet, government information in the hand of the public has the potential to curb corruption. Access to and use of government information by members of the public and civil society entities is likely to promote public accountability, which, in turn, is likely to result in lower levels of corruption.

This study is exploratory; it aims to find out whether access to and use of government information by the public has any effect on reducing corruption. The study also aims to find out if e-government has an independent effect on reducing corruption. The significance of this study can be justified on both theoretical and practical grounds. On the theoretical level, the study is an attempt to establish a causal link between corruption and a factor that may influence it. In this sense, it is an addition to a small but growing body of literature on the causes of government corruption. On the practical level,

the study may yield findings that may provide the impetus for launching policy initiatives to combat corruption.

The study is divided into five sections. Section 1 outlines the inherent difficulties in studying corruption. Section 2 discusses the limitations on using e-government to reduce corruption. Section 3 discusses the relationship between access to government information, public accountability, and corruption. This section is the theoretical underpinning of the study. Section 4 provides an empirical multivariate regression model to see if there is a causal link between access to government information and corruption at the macro level. In section 5, a few cases are presented to underscore the impact of access to and use of government information, through traditional media, on corruption at the micro level. The last part of the study presents a summary, conclusions, and policy implications.

1. Studying Corruption:

At the outset, it is useful to shed light on government corruption. Corruption is generally defined to refer to the use of public office or authority for personal or private gain (AbdelRahman, 2018). Common examples of corruption associated with bureaucratic provision of services to the public include, inter alia, bribes and kickbacks

There are inherent limitations on studying corruption, not the least of which is the multitude of factors that have been suggested as influencing the phenomenon. Economic factors proposed include inflation, economic wealth, economic freedom, etc. (Paldam, 2002; Graeff & Mehlkop, 2003; Andersen, 2009; Mistry & Jalal, 2012; Pieroni & d'Agostino, 2013; Zhao & Xu, 2015). Political factors thought to influence government corruption include e-government, size of the public sector, democracy, government regulation, rule of law, law enforcement; political instability, government effectiveness, etc. (Tanzi, 1998; Treisman, 2000; Paldam; 2002; Kim 2014).

In view of the myriad of factors that may affect corruption and may be affected by it, assertions have begun to emerge underscoring the inherent difficulty in investigating the influences on corruption. As a social behavior, corruption is seen to be subject to numerous influences. It is also seen to influence both individual behavior and social institutions. For researchers trying to explain it, this means that their explanatory factors may be influenced by the very same phenomenon that they try to account for. This is well reflected in Treisman's (2000: 437) statement that:

Corruption is hard to study empirically. Its many likely determinants interrelate in complicated ways. Some can change quickly and may be caused by corruption as well as the reverse. As with other types of criminal activity, it is hard to observe directly, and so researchers must rely on surveys of corruption's victims, the accuracy of which is often difficult to assess.

In a similar vein, this view is echoed by the IMF perspective on the relationship between corruption and a number of economic variables (e.g., government spending, taxation, economic growth, etc.) that are usually hypothesized as affecting corruption. According to this perspective, corruption affects these variables through its effect on public finance (Hillman, 2004).

Information technology is also seen as a factor influencing corruption, though insignificantly. In this respect, Heeks (1999:188) notes that Corruption is a phenomenon rooted in the cultural, political, and economic circumstances of those involved. IT does little to affect these root causes, remains limited in its surveillance potential, and so cannot eliminate corruption.

While IT may have little effect on corruption, the latter may even bring about the failure of IT (e-government) projects (Aladwani, 2016).

The difficulty in investigating the influences on corruption may be compounded by some potential methodological problems associated with the use of cross-country data in multiple regression analysis which is usually used in those investigations. One such problem is heteroskedasticity. This problem makes T-tests and, by implication, hypothesis tests unreliable. Another potential methodological problem is multicollinearity. This problem represents a violation of the regression assumption that regressors or independent variables are not correlated. Multicollinearity inflates the standard errors of regression coefficients, thereby increasing the probability of rendering those coefficients statistically insignificant and thus of accepting null hypotheses. Notwithstanding the availability of methods to deal with this problem, previous studies rarely, if ever, employ them.

Both of these problems are important inasmuch as they may lead to erroneous causal inferences. In particular, collinearity may be associated with model misspecification and hence the attribution of erroneous causation (Winship & Western, 2016). This study employs methods to detect and correct for both of these problems. In dealing with Heteroskedasticity, it uses bootstrapping, which is embedded in recent versions of SPSS-PC, for regression coefficients. This method generates heteroskedastic robust standard errors for regression coefficients (Flachaire, 2005).

2. The Limitation of E-Government as an Anti-Corruption Tool:

Among the myriad of factors reported to influence the level of corruption, e-government, is arguably the most widely used. A major strand in the literature on e-government deals with the effect of this Web-based technology on corruption (Shim & Eom, 2008; Andersen, 2009; Elbahnasawy, & Revier, 2012; Mistry, & Jalal, 2012; Elbahnasawy, 2014; Kim, 2104; Zhao & Xu, 2015). The availability of cross-country data on individuals' perceptions of corruption, economic freedom, e-government, democracy, rule of law, etc. has enabled researchers to investigate the effect of e-government on corruption. More often than not, researchers have used

multiple regression models in this investigation. As previously noted, this kind of research is fraught with potential methodological problems, particularly multicolinearity, heteroskedasticity, and endogeneity which in this case refers to regressing corruption, the phenomenon to be explained, on regressors which contain some measure of corruption (i.e., simultaneous causality).

Previous studies investigating the effect of e-government on corruption do not usually pay attention to these problems, notwithstanding their potentially confounding effects on the results of testing their research hypotheses. Nonetheless, a consistent research finding reported in such studies is that e-government, together with other factors, curbs or reduces government corruption. A stylized fact(1) or an empirical generalization emerges from those studies: e-government reduces or curbs corruption.

E-government is unlikely to have but a limited impact on the level of corruption in developing countries. In those countries, Internet penetration in the society is extremely limited. For instance, Internet penetration rates in Africa and Asia (whose combined population is 72.1 % of world population) are, respectively 39.6 % and 54.2%. These are well below the world penetration rate of 58.8% (Table 1). Ironically, most of these countries have the highest corruption levels in the world. For instance, of the 13 countries that score the lowest (18 or less) on the 2016 Corruption Perceptions Index, only one country; namely, Venezuela is not in Africa or Asia. Similarly, of the 94 countries scoring 39 or less on this index, only 26 countries are not in Africa or Asia. Under such conditions, one would not expect Web-enabled government information and services, which are very limited, to have but an insignificant impact on the level of corruption.

(1) On stylized facts, see Daniel Hirschman (2016). Stylized Facts in the Social Sciences. *Sociological Science* 3: 604-626.

Table 1: World Internet Usage and Population Statistics

World Regions	Population (2019 Est.)	Population % of World	Internet users 30 June 2029	Penetration Rate (% of Population)
Africa	1,320,038,716	17.1 %	522,809,480	39.6 %
Asia	4,241,972,790	55.0 %	2,300,469,859	54.2 %
Europe	829,173,007	10.7 %	727,559,682	87.7 %
Latin America/ Caribbean	658,345,826	8.5 %	453,702,292	68.9 %
Middle East	258,356,867	3.3 %	175,502,589	67.9 %
North America	366,496,802	4.7 %	327,568,628	89.4 %
Oceania/ Australia	41,839,201	0.5 %	28,636,278	68.4 %
World Total	7,716,223,209	100.0 %	4,536,248,808	58.8 %

Source: Internet World Stats: http://www.internetworldstats.com/stats.htm Accessed on January 6, 2020.

A third limitation of e-government in combating corruption is that its online services are limited, as they do not cover the whole gamut of government services. For instance, online services do not cover street-level public bureaucrats (e.g., police and traffic officers) or bureaucrats in services that require physical interface between service providers and members of the public (e.g., teaching, nursing, geriatrics, etc.) In some developing countries, those bureaucrats are reported to have the highest levels of corruption. Thus, according to the 2013 Global Corruption Barometer (GCB), most people surveyed in 36 countries saw the police as the most corrupt institution. Fifty-three percent of the people surveyed in those countries reported having paid a bribe to the police. Similarly, the 2015 GCB reported that most people surveyed across Africa saw the police as the most corrupt government institution (GCB, 2015:10). Obviously, this is potentially detrimental to the rule of law and law enforcement which is crucial for the fight against corruption.

In view of the potential limitations of e-government to provide government information and online services to most people in developing countries, it is not suggested here that e-government is not useful in the fight against corruption. However, given those limitations, traditional media (e.g., TV, radio, the press, phones, etc.) have the potential to be more effective in providing government information and services to the general public. The use of such media is likely to fill in the gap associated with using Web-based media, which are characterized by limited societal penetration in those countries. Thus, in view of their potentially greater outreach capability, traditional media may be more effective tools for making government transparent, publically accountable, and hence less corrupt.

In passing, it is worth noting that social media (e.g., blogs, Twitter, YouTube, Text messaging, Wikis, Facebook, etc.) have of late been highlighted as tools for e-transparency, civic engagement, and public

accountability (Bertot, Jaeger & Grimes, 2010; Jaeger & Bertot, 2010; Bertot, Jaeger & Hansen, 2012). This type of Web-based media is likely to be effective as e-transparency tools in developed countries in Europe and North America, on account of the high computer and Internet penetration found in these countries (Table 1). However, this is highly unlikely to be the case in developing countries where computer and Internet penetration rates are very low. It is worth noting that even in developed countries like the United States such media have accessibility and inclusion challenges.

3. Government Information, Public Accountability, and Corruption:

It is important to define what is meant by government information and what access to it is. Government information may refer to information on decision-making processes in government, information on government services, information on government performance, etc. A government that shares such information with the public empowers the public with tools to hold it accountable. Recently, e-government has been a most widely used conduit to make government information and services available and accessible to the public. The extent to which people have access to and use of such information can be gauged by asking members of the public about their perceptions of and experiences with information provided by the government. Hence, access to and use of government information by the public refers to actual people's experiences with and perceptions about such information. This study uses a newly constructed cross-country index of access to and use of government information by members of the public.

Needless to say, access to and use of government information is critical for public accountability and public service integrity. The very notion of public accountability, which has been an enduring core value in the study of public administration, is predicated on the assumption that the public is informed about the rules, processes, and performance of their government.

Public accountability is the antithesis of corruption. Klitgaard's (1998) widely-reported corruption equation illustrates the relationship between transparency, accountability, and corruption: Corruption= Monopoly + Discretion – Accountability.

In other words, when public officials have discretionary power and do not share information (i.e., lack of transparency) on their actions/inactions and there is no accountability, the end result is corruption.

A key term in this equation is accountability which is rather elusive, in view of its multiple variants. According to Heeks (1998), public accountability should be distinguished from political accountability, managerial accountability, financial accountability, legal accountability, and professional accountability. Public accountability simply refers to the accountability of public servants to citizens and clients outside public bureaucracies. This implies that (a) the public is informed about the decisions made by public officials, (b) those officials can be called upon to account for the performance outcomes of their actions/inactions, (c) some sanctions (i.e., rewards and punishments) can be applied where the public is satisfied/dissatisfied with the performance outcomes of those officials, and (d) there is some control on public officials. These four elements are echoed by Koppell's (2005) five principles of public accountability: Transparency (i.e., the public is informed about their government actions/inactions), liability (i.e., the application of sanctions), controllability (i.e., public officials can be called to account), responsibility, and responsiveness.

Critical to public accountability is the role of the members of the public and civil society entities. It is the public and those entities that initiate actions (e.g., lodging complaints), based on access to government information, that lead to holding public officials accountable. The pivotal role of the public and civil society entities is underscored by a variant of accountability referred to as social accountability which is defined as "an approach towards building accountability that relies on civic engagement,

i.e., in which it is ordinary citizens and/or civil society organizations who participate directly or indirectly in exacting accountability." (Malena, Forster, & Singh, 2004: 3). Social accountability is seen to be an antidote against corruption (Malena et al. 2004: 8):

By monitoring government performance, demanding and enhancing transparency and exposing government failures and misdeeds, social accountability mechanisms are …. powerful tools against corruption. …….. The only true safeguard against public sector corruption is the active and on-going societal monitoring of government actions and the evolution of more open and participatory anti-corruption institutions.

Critical as it is to public accountability, access to and use of government information does not automatically render public officials accountable. It may lead to transparency which is the core dimension of public accountability. The divulgence of information on government actions/ inactions may prompt the public and civil society entities to ask public officials to answer for their performance. However, without the concomitant application of sanctions, answerability falls short of public accountability. According to Fox (2007), this is soft accountability. Hard accountability requires the application of sanctions or of compensatory/remedial actions to rectify grievances engendered by the actions/inactions of public officials.

Whether transparency in government performance beefed up by hard accountability leads to less corruption is, in the final analysis, an empirical question. Nonetheless, dramatic reduction in corruption levels resulted from some actual anti-corruption initiatives that provided information on government performance and an enabling institutional and political environment for hard accountability. A notable case in point is the OPEN System of Seoul Municipality (Kim, Kim, & Lee, 2009). In this case, the strong support of political leadership was a crucial factor, as was an enabling institutional environment manifested in the existence of buoyant public complaint and prosecutory mechanisms.

3.1. Research Questions and Hypotheses of the Study:

The preceding discussion provides grounds for formulating two major research questions and related hypotheses. Obviously, a key research question is to what extent does access to and use of government information reduce government corruption. Another research question is whether e-government has any effect on reducing corruption. Related hypotheses are as follows:

H1: Access to and use of government information makes a statistically significant reduction in government corruption.

H2: E-government has not statistically significant effect on governmental corruption.

4. Methods:

In the empirical literature on investigating corruption, researchers usually use multivariate regression models based on cross-country data drawn from cross-sections of countries. This study also employs this method in that it uses data from a cross-section of countries. The study uses data drawn from a sample of more than 100 countries.

In view of the numerous factors that affect corruption, any model aiming at assessing this effect has to control for those factors. The following model is estimated:

CORR= B1 – B2 GOVT.INFOR – B3 ECON.FREE – B4 GDP.PC + B5 CONFL +B6 INFL - B7 OSD – B8 ECON.FREE.ECON.DEV

Where

CORR= Corruption

GOVT.INFO = Government Information

ECON.FREE= Economic Freedom

GDP.PC= Gross Domestic Product Per capita

POL.INST=Political Instability

INFL=Inflation

OSD=Online Services Development

ECON.FREE.ECON.DEV= Economic Freedom and Level of Economic Development

4.1. Dependent Variable: Corruption:

The cross-country measure of corruption that has extensively been used by researchers is the Corruption Perceptions Index (CPI) published annually by Transparency International in Germany. The index does not measure actual experience with corruption; it simply reflects the opinions or perceptions of individuals about corruption in a country. Another problem with this measure is that it may embody the individualistic or reductionist fallacy(1) in that it makes inferences about countries based on evidence (i.e., individuals' perceptions) gathered from individuals. Notwithstanding these problems, CPI remains the most widely used cross-country measure of corruption. This study uses the 2015 CPI.

Although the CPI is designed to measure a country's level of corruption, a country's score on the index actually reflects how corruption-clean that country is. The index gives each country surveyed a value or score between 0 and 100. In other words, a high score (e.g., 98) indicates very low level of corruption. Conversely, a low score (e.g., 10) indicates a high level of corruption. For consistency and interpretation of data analysis results,

(1) On the concept of individualistic fallacy, see C. F. Nachmias and D. Nachmias (2000), Research Methods in the Social Sciences (6th Edition) (New York: Worth Publishers): 48-49.

this study transforms the scores for the sample of countries used so that high scores indicate high levels of corruption while low scores reflect low levels. This transformation is achieved by subtracting each country's score from 100. Thus, the 2015 CPI's scores for Denmark and Zimbabwe are 91 and 21, respectively. After transformation, the scores for Denmark and Zimbabwe are, respectively, 9 and 79.

4.2. Independent Variables:

Access to and Use of Government Information:

This is the key explanatory variable in the model. This study uses the 2015 Open Government Index (OGI) published by World Justice Project (WJP). The OGI, which was published for the first time in 2015, provides a score and a rank for each one of more than 100 countries. Its score, which ranges from 0 to 1, is an aggregate of four dimensions of government openness: (a) publicized laws and government data, (b) right to information, (c) civic participation, and (d) complaint mechanisms. The index is based on surveys of the actual experiences and perceptions of the general public on those dimensions. This variable is expected to have a negative effect on corruption.

Economic Freedom:

This is an important control factor in the study's empirical model. In general, previous research has demonstrated that, given the level of economic development and wealth, economic freedom curbs corruption (Chafuen & Guzmán, 2000; Padam, 2002; Graeff & Mehlkop, 2003; Pieroni & d'Agostino, 2013). Economic freedom is expected to reduce corruption. This is related to the so-called rent-seeking hypothesis which, in the context of government regulation, posits that discretionary authority provides public officials with the opportunity to solicit or extract rents (i.e., bribes/kickbacks) in exchange for desired government services and/or

information. By removing regulation, economic freedom deprives officials of the opportunity to engage in rent seeking.

Surprisingly enough, this important control variable rarely appears, if ever, in multivariate regression models investigating influences on corruption. A multi-dimensional phenomenon, economic freedom encompasses components that remove opportunities for corrupt practices. In general, this is the case with those corrupt practices that arise from the physical interface between those who seek public services/information and public officials who deliver those services/information. A case in point is bribes and kickbacks. A key economic freedom component which obviates the need for such interface is deregulation.

In this study, economic freedom, conceived as freedom to engage in productive economic activities, is used. Methodologically, this study uses an overall single measure of economic freedom rather than multiple measures of its various components. In previous research, various components of economic freedom were incorporated into single regression models. This is likely to cause the multicollinearity problem, as those components are likely to correlate with each other.

This study uses the 2015 Heritage Foundation Index of Economic Freedom. This index provides a measure of the extent to which economic agents (i.e., individuals and businesses) are free to engage in economic activities. The Foundation's measure of economic freedom combines measures of 10 dimensions, including freedom from corruption. For this study, freedom from corruption is excluded from the overall score of economic freedom to avoid endogeneity which will arise if corruption, the dependent variable, is also included in the model as an independent/ explanatory variable.

Economic Freedom and Level of Economic Development:

Previous research (Graeff & Mehlkop, 2003) has shown that economic freedom alone does not have a statistically significant effect on corruption. However, it is reported that (Graeff & Mehlkop, 2003) when economic freedom interacts with high level of economic development, it yields a statistically significant effect on corruption. In the regression model below, economic freedom and level of economic development is included as an interaction term. In the model, level of economic development is a dummy variable that takes the value 1 for high level of economic development and 0 otherwise. Organization of Economic Cooperation and Development (OECD) countries are selected as countries with high level of economic development and are thus assigned the value 1; all other countries in the study are assigned the value 0.

Level of a Country's Wealth:

This is an important control variable, as study after study (Treisman, 2000; Paldam, 2001; Graeff & Mehlkop, 2003; Anderson, 2009; Saha & Gounder, 2013) has found that it reduces corruption, when measured as gross domestic product per capita. For this study, the 2014 gross domestic product per capita at purchasing power parity (PPP) is used to measure a country's level of wealth. The natural logarithm is applied to the values of this variable with a view to guarding against the heteroskedasticity problem which is usually expected to be present in cross-national income data. To further guard against this problem, bootstrapping of regression coefficients is used to produce heteroskedastic-robust standard errors for regression co-efficients.

Political Instability:

Political instability appears frequently in the empirical literature as a factor leading to corruption (Treisman, 2000; Hillman, 2004; Shim & Eom,

2008; Pellegrini & Gerlagh, 2008). Underpinning the relationship between political instability and corruption is the argument that the former creates conditions of lawlessness that is conducive to corruption. However, the reverse argument has also been made; corruption may also cause political instability (Treisman, 2007; Elbahnasawy, 2014).

This causal relationship appears to be buttressed by a 2015 report on peace and corruption. The report concludes that increases in police and judicial corruption directly undermine the rule of law, thereby increasing domestic violence and conflict (Institute for Economics and Peace Study, 2015). However, limiting government corruption to only two state institutions (i.e., the judicial system and police) may not capture the full extent of corruption in a country, including those aspects of corruption that may be affected by political instability. For instance, one study has found that political instability motivates officials to embezzle public funds (Campante, Chor & Do, 2008). Moreover and rather ironically, the study of the Institute of Economics and Peace has found that out of 16 indicators of domestic peace/violence, political instability is the only indicator that has a statistically significant effect on corruption, though at 0.1 level of significance.

Data on political instability is obtained from the 2015 Global Peace Index published by the Institute for Economics and Peace. The 2015 Index assigns a score and a rank for each of its list of 162 countries.

Inflation:

In the literature (Paldam, 2001), inflation is used as a proxy for economic chaos. The so-called chaos or demoralization hypothesis posits that economic chaos has a corrosive effect on public morale and trust in authorities. Corruption was found to have a strong negative correlation with trust in government (Paldam, 2001). Therefore, the greater the economic chaos or the higher inflation is, the higher will be the level of corruption.

Regardless of being a proxy for economic chaos or not, inflation in its own right may lead public officials to engage in corruption. High inflation reduces real incomes if nominal incomes (e.g., salaries of public officials) do not increase as inflation increases. Faced with diminishing real incomes during high inflation, public officials may resort to corrupt practices to supplement their incomes. Thus, it can be hypothesized that the higher the inflation rate, the higher is the level of corruption.

Online Services Development:

The rationale for including this variable in the model is, as previously pointed out, the fact that a multitude of studies on the influences on corruption included e-government-related variables in their models. Information on this variable is published by the United Nations in its annual E-Government Development Index (EGDI), which gives each one of its member countries a value that ranges between 0 and 1 inclusive. This index is a composite of three indexes: Online Services Index (OSI), Information and Telecommunications Index, and Human Capital Index. Each one of these indexes also gives each member country a value that ranges between 0 and 1 inclusive.

The OSI is a measure of the extent to which governments provide services and information through their portals. The use of those portals by members of the public does not require any physical interaction with public officials, thereby precluding opportunities for corrupt acts (e.g., taking bribes and kickbacks). Thus, it can be hypothesized that the more developed and extensive a country's e-government is, the less will be opportunities for corruption and the less will be corruption itself. This is related to the aforementioned rent-seeking hypothesis. The study uses the 2015 OSI, which was published in 2016.

4.3 Regression Results:

Table 1 presents regression results. As shown in the table, the model explains 85 %, as indicated by the value of the R-squared, of the variation on corruption. The regression coefficient for GOVT.INFO is in the right direction and statistically significant. Its beta co-efficient has the largest value among those of all other independent variables, indicating that this variable is the most important influence on corruption in the regression model.

Table 1 also shows that the co-efficients for INFL, POL.INST, and GDP.PC are in the right direction and statistically significant, confirming previously reported research findings that political instability and inflation increase corruption whereas GDP.PC reduces it. As expected, ECONFREE does not have a statistically significant effect on corruption. Moreover, its co-efficient is not in the right direction. However, the interaction of level of economic development and economic freedom tends to reduce corruption, though this effect is statistically significant at .07. The co-efficient for OSD is neither in the right direction nor being statistically significant.

Table 1 also displays collinearity results of the estimated regression model. These results indicate insignificant multicollinearity, as the variance inflation factor (VIF) for each regressor is less than 4, the cutoff threshold value generally accepted in the literature (Carney & Surles, 2002; O'Brien, R. 2007) as indicative of insignificant collinearity.

Table 2 displays bootstrap for regression co-efficients. These co-efficients are heteroskedastic-consistent for all predictors in the regression model. All co-efficients retain their statistical significance levels shown in Table 1 which displays regression results without bootstrapping. The bootstrap results suggest heteroskedastic-robust standard errors for regression co-efficients, implying reliable T-tests and statistical inference (Flachaire, 2005).

Table 2: Regression Results

Independent Variables	Unstandardized Coefficients		Standardized Coefficients	T-Test	P-Value.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Constant	122.918	12.525		9.814	.000		
GOVT.INFO	-82.116	12.623	-.480	-6.506	.000	.297	3.363
ECONFREE	.004	.055	.003	.077	.939	.818	1.222
INFL	.230	.112	.091	2.062	.042	.834	1.199
POL.INST	9.988	2.242	.217	4.454	.000	.682	1.466
ECONFREE. ECONDEV	-.076	.042	-.118	-1.791	.077	.376	2.661
GDP.PC	-4.791	1.308	-.255	-3.662	.000	.334	2.996
OSD	2.067	6.128	.024	.337	.737	.332	3.011

R2 = .85

Table 3: Bootstrap for Regression Coefficients

Independent Variables	B	Bootstrap*				
		Bias	Std. Error	P-Value	95% Confidence Interval	
					Lower	Upper
Constant	122.918	-1.227	15.015	.001	92.098	152.357
GOVT.INFO	-82.116	1.438	14.614	.001	-111.734	-51.907
ECONFREE	.004	-.014	.087	.958	-.210	.112
INFL	.230	-.016	.120	.018	-.107	.433
POL.INST	9.988	.154	2.605	.002	5.271	15.695
ECONFREE. ECONDEV	-.076	-.005	.053	.161	-.185	.023
GDP.PC	-4.791	.120	1.513	.004	-7.761	-1.886
OSD	2.067	.292	6.735	.752	-10.510	15.812

* Bootstrap results are based on 1000 bootstrap samples.

5. Cases of Access to and Use of Government Information and Corruption[1]:

In summary, results of the estimated regression model supports the aforementioned hypotheses. Indeed, access and use of government information appears to reduce government corruption whereas e-government seems to have no effect on such corruption.

As previously pointed out, a few cases are discussed with a view to corroborating the findings based on the empirical regression model. The first two cases demonstrate that hard accountability mechanisms are a sine qua non if access to government information is to be an effective tool for reducing corruption. The third case shows that corruption can be entirely eliminated through access to and use of government information by the public. The first two cases also demonstrate that traditional media are effective where Internet-based media proved unsuccessful, due to limited penetration in the society, in bringing government information and services to the public.

5.1 Case 1: Using Interactive Television to Provide Municipal Information and Services in an Indian State:

An elected municipality in the Indian State of Andhra Pradesh introduced a multi-channel project known as Versatile Online Information for Citizen Empowerment (VOICE) with a view to providing information on government activities and online services to citizens. The system also provides various online services, online complaints and grievances, and e-transparency for some services. The system also provides senior decision-making officials in the municipality with information on corruption-related complaints.

(1) Cases 1 and 2 can be found in E-government for Development. In http://www.egov4dev.org/transparency/case/#egov. Accessed on July 26, 2017. Case 3 was reported by Heeks, R. (1998). Information Systems and Public Sector Corruption. *Information Systems for Public Sector Management Working Paper Series Paper No.4* (Manchester: Institute of for Development Policy and Management), 1-12.

VOICE features an innovative technology that combines both Internet-based technology and traditional media (phones and television) in order to provide government information and services to citizens. This grew out of the failure of the Web-based service that had earlier been attempted. VOICE works by providing a link connecting servers of the municipality to servers at one of the local cable TV stations. Citizens can then use a combination of their telephone plus TV screen to access information and services. This innovative technology was made possible by the digitization of most municipality operations and records into a database accessible to citizens and businesses. Thus, the system enables G2C, C2G, B2G, and G2B interactions.

This combined technology overcame two obstacles in serving citizens and businesses of the municipality: First, it provided information and services to a much larger number of people than was previously the case when services and government information were only Web-based. Prior to the introduction of the combined information system, only 4000 households of the municipality's 200,000 households (that is merely 2 %) had their own computers and Internet access. As a result, website usage rates were merely two or three hits per day.

In order to increase accessibility to municipal information and services, 21 kiosks were installed throughout the municipality. The kiosks had operators, thereby obviating the need for computer literacy as a requirement for using the system. The addition of VOICE interactive cable TV channel had a dramatic increase in citizen access to government information and services. It was reported that half of the municipality's households were able to access the system. System usage rate increased to 1000 per day.

The second obstacle overcome by VOICE was to obviate the need for citizens (a) to shuttle between government offices in repeated visits to get services and/or to (b) pay bribes to get things done, thereby creating a bad image of the municipality among members of the public, the result of which

was declining revenues as citizens refused to pay for services. There was a perception that the rates of bribery were reduced.

It is evident that VOICE created a system where public access to and use of government information, bolstered by hard accountability mechanisms, produced an accountable municipal public service that led to the reduction in the level of corruption.

5.2 Case 2: Using Text Messaging for Public Complaints:

The Philippine National Police has introduced a national text messaging service designed to enable citizens to (a) seek emergency service, (b) report crime, and (c) report crimes, including those committed by police officers such as abuse of members of the public, bribes in relation to real or bogus crimes, protection payments demanded from businesses, and failure to arrest criminals.

A principal reason for using the text messaging system for transparency is its capacity to enable a much large number of the public to report crimes and lodge complaints against members of the police than the existing Web-based system: Complaints, Referral, Action, Investigation and Verification Information System (CRAIVIS). This Web-based system had much lower usage rates due to the limited Internet penetration in the Philippine society. Another reason for the introduction of the system was cost-efficiency and ease of use.

Mobile phone users would initiate the process by sending text messages which would pass through the telecom provider's server and ultimately end up with the appropriate police unit. A team within the police force is supposed to inform the sender on the status of the case reported and on any action taken. A record of each complaint is supposed to be maintained until that complaint was finally dealt with.

It was reported that the system was successful in terms of enabling the public to ask for assistance and of reporting wrongdoing committed by members of the police force. However, it was also reported that there was no evidence that the system changed the behavior of members of the police. In fact, fourteen years after the introduction of the system, Philippine police has recently been reported to be the most corrupt institution in the country. The country's President said to his police force," You are corrupt to the core. It's in your system." He added that up to 40% of policemen were used to corruption (BBC, January 30, 2017).

It is evident that the text messaging system has provided only soft accountability or answerability. It is deficient in hard accountability mechanisms, particularly in regard to prosecuting corruption-related crimes committed by members of the police force. The system entrusted a corrupt police force with the task of investigating and prosecuting corruption-related complaints against members of the force itself. An independent investigatory and prosecutory mechanism might have made a difference in terms of effectively resolving public complaints. This could result in the prosecution of police wrongdoers and/or in compensating members of the public aggrieved by police wrongdoing. In turn, this could foster civic engagement with the system.

5.3 Case 3: Access to and Use of Government Information Eliminates Bribery in a Customs Department:

A customs department kept manual records with the names and addresses of foreign firms which had been involved in import or export transactions. This information was needed by local entrepreneurs, particularly those seeking export partnerships. To secure the information, the entrepreneurs paid bribes to customs officials.

The department computerized its operations and processes. Information sought by the local entrepreneurs was entered into a computer. This

computer was put into a front office where members of the public could access it. Entrepreneurs gained direct access to the information they wanted. Accordingly, bribe payments ceased. Thus, access to and use of government-held information eliminated bribery.

The preceding cases provide merely anecdotal, rather than systematic, evidence that points to the need to look for systematic evidence, if any, that sheds light on the extent to which access to and use of government information reduces corruption. However, such cases complement empirical research at the macro level, as this research may not provide informative details and insights likely to be found at the micro or case level.

The aforementioned cases underscore the importance of traditional media for making government information accessible to the general public where Web-based media have limited penetration in the society. Particularly in developing countries, traditional media may have to be an important component of policy initiatives to use access to government information to reduce corruption. Compared to Web-based media, traditional media may fare better in terms of cost-efficiency, inclusion/outreach capacity, and ease of use. Moreover, traditional media may help mitigate the information asymmetry/inequity attendant on using Web-based media to provide government information and services, as Web-based media tend to favor urban residents in developing countries. As the cases demonstrate, traditional and Web-based media may be used together to foster accessibility, equity, efficiency, effectiveness, and quality in public service.

Summary, Conclusions, and Policy Implications:

The study demonstrates that public access to and use of government information reduces corruption. Previous research has rarely explored the effect of access to government information on corruption. This study does not lend empirical support to the principal research finding of those studies that investigated the impact of e-government on corruption. As

previously noted, this finding states that e-government reduces corruption. E-government, in so far it depends on the Internet, has a characteristic limitation, particularly in the context of developing countries. As earlier pointed out, this constraint is the fact that most developing countries have limited computer and Internet penetration in their societies. Moreover, the countries with the highest level of corruption have the most limited computer and Internet penetration rates. In addition, the scope of Web-enabled government services is limited in both developed and developing countries.

In this study, the research finding that access to and use of government information, rather than e-government, curbs corruption is consistent with the fact that e-government is not the only medium for access to and use of government information. Traditional media (e.g., TV, phones, radio, the press, etc.) can be used as effective conduits to providing government information and services to the general public, particularly where computer and Internet penetration is very limited. This raises an important question for policy makers when formulating an anti-corruption strategy. Given the status of e-government development in the country and, concomitantly, the degree of computer and Internet penetration in the society, is e-government sufficient by itself to provide government information and services to combat corruption? Or does it need to be combined with traditional media to be an effective tool in the fight against corruption?

The provision of information on government processes, procedures, and performance is not, as the cases show, sufficient by itself to curb corruption. A supportive institutional and political environment is indispensable. In particular, an access to government information policy for combating corruption needs to be accompanied by mechanisms for the resolution of complaints lodged by the general public and for the prosecution of corrupt officials.

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الحصول على المعلومات الحكومية وتاثيرها على الفساد الحكومي

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ملخص البحث:

تهدف هذه الدراسة إلى تقييم أثر حصول الجمهور على المعلومات الحكومية واستخدامها على الفساد الحكومى. من الناحية المنهجية، تستخدم الدراسة نموذج الانحدار متعدد المتغيرات لتقييم هذا التأثير. تعتمد الدراسة على البيانات عن الدولة كوحدة تحليل. كما تعتمد الدراسة أيضًا على عدد قليل من الحالات على المستوى الجزئي بهدف تأكيد نتائج نموذج الانحدار متعدد المتغيرات. لقد تم تصميم الدراسة لتصحيح بعض المشاكل المنهجية التي تصادف عادة في نماذج الانحدار المستخدمة في البحث عن أسباب الفساد.

تظهر ثلاث نتائج رئيسة من الدراسة. أولاً- يقلل حصول الجمهور على المعلومات الحكومية من الفساد على المستويين الجزئي والكلي. ثانياً- البيئة المؤسسية والسياسية الداعمة شرط لا غنى عنه لفعالية حصول الجمهور على المعلومات الحكومية كأداة لمكافحة الفساد. ثالثًا- إن استخدام الجمهور للوسائط التقليدية (مثل: التلفزيون، والراديو، والهواتف المحمولة، وما إلى ذلك) أداة سياسية فعالة للحد من الفساد، خاصة في السياقات التي تتسم بالانتشار المحدود للكمبيوتر والإنترنت في المجتمع. بالنسبة للبلدان النامية، فإن حصول الجمهور على المعلومات الحكومية واستخدامها قد يكون عنصرًا مهمًا في مبادرات سياسة مكافحة الفساد.

الكلمات الدالة: حصول الجمهور، المعلومات الحكومية، الفساد.

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