E-Government, Internet Adoption, and Corruption: An Empirical Investigation

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Abstract. — This study empirically investigates the impact of e-government and internet adoption on curbing corruption, by utilizing a large panel dataset. The results reveal that e-government is a powerful tool in reducing corruption—via telecommunication infrastructure and the scope and quality of online services—which is strengthened by greater internet adoption. The interaction effects between e-government and internet adoption suggest both as complements in anti-corruption programs. A dynamic panel data model that addresses the endogeneity problem and considers corruption persistency is employed. Results of panel Granger causality tests indicate a unidirectional causality from e-government to corruption, while a bilateral causality between internet adoption and corruption.
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Key words — corruption, e-government, internet adoption, law enforcement

1. INTRODUCTION

Many policymakers and various international organizations who are committed to promoting sustainable development and global economic growth have recently embraced the view that e-government would play a substantial role in the battle against corruption (Bhatnagar, 2003; Organization for Economic Co-operation and Development (OECD), 2005; United Nations Development Program (UNDP), 2006, 2008). E-government is alleged to lower the interaction between government officials and citizens, and hence diminish the discretionary power of officials. It may also enhance accountability and transparency by disseminating a greater quantity and a higher quality of information in the economy, which incites citizens and businesses to question arbitrary decisions and unreasonable procedures. Thus, e-government may possibly eliminate many opportunities for corruption (OECD, 2005; Piatkowski, 2006). Accordingly, it can combat corruption and hence boost economic growth, particularly in developing countries where corruption appears to be the single greatest obstacle to economic development, as identified by the World Bank (2001). This is because corruption deteriorates national institutions, erodes the incentive system meant to maintain economic growth and sustainable development, escalates economic inefficiency, and impedes the success of United Nations Millennium Development Goals. [1]

However, it can also be argued that e-government may lead corrupt public employees to learn ways to beat the new e-government systems, as these systems can have weaknesses that enable corrupt behavior to continue and may even grow faster (Bhatnagar, 2003). Thus, e-government can be unsuccessful tool in curbing corruption. [2]

Yet, to the best of my knowledge, the empirical evidence of the impact of e-government on corruption is scant. Only a handful of case studies using the micro-level data report some effect of e-government implementation on corruption reduction. Examples of those studies—where e-government is shown to reduce corruption—include Kim, Kim, and Lee (2009) and Chawla and Bhatnagar (2004). [3] Conversely, using five case studies, Heeks (1998) argues that information technology may even create new opportunities for corruption of

public officials. A few other studies have attempted to estimate the impact of internet adoption on corruption. For instance, while Andersen (2009) found support for the view that e-government is a useful tool in reducing corruption, he claims that the internet use is more important than e-government in fighting corruption. Likewise, Goel, Nelson, and Naretta (2012) argue that the internet reduces corruption by enhancing the access to information and the speed of information dissemination, which raises the level of corruption awareness and elevates the detection risk of corrupt behavior. However, it can also be claimed that the internet may possibly increase corruption perception by disseminating information about corrupt acts from individuals' perspectives—such as amateur video uploads—which gives rise to the feeling that "everyone is corrupt" and hence encourages persistent corruption.

Andersen (2009) stresses the need for macro evidence on the effect of e-government on corruption since it is also possible that e-government may cause corruption to migrate elsewhere in the economy. Hence, e-government may turn out to be ineffective on the macro level, even though micro-level evidence suggests that it is effective in combating corruption. In the same line, Ojha, Palvia, and Gupta (2008) emphasize the need for empirical research evidence on the effects of e-government on anti-corruption efforts since the majority of current research is theoretical and descriptive. In a similar vein, although it recently supports e-government as a component of anti-corruption programs, the UNDP asserted that much of the evidence that links e-government to corruption reduction is anecdotal (United Nations Development Program, 2006, p. 4).

This paper attempts to correct this shortcoming by empirically investigating the role that e-government and the level of internet adoption play in reducing corruption, both in

developed and developing countries. Understanding the linkage between e-government and corruption would enable using e-government more effectively in anti-corruption efforts. Furthermore, it would allow giving considerable priority to curbing corruption in defining the vision and priority areas of e-government, especially in developing countries. Hence, e-government can be used as a tool to fight corruption and to promote economic development, along with enhancing the quality of services provided to citizens and advancing good governance. This work also examines the interaction effects between e-government and internet adoption on curbing corruption. A comprehensive panel data set was compiled, which consists of 160 countries, covering the period from the year 1995–2009. The study employs a unique measure of e-government from the United Nations covering various dimensions of e-government that has never been utilized before in prior research on corruption. To estimate the effects of e-government and internet adoption on corruption, besides a random effects analysis, this paper adopts a dynamic panel data model, in order to deal with the potential endogeneity problem and to consider the inertia inherent in corruption (Mishra, 2006; Tirole, 1996). The direction of causality between e-government and corruption, and between internet adoption and corruption, is examined by employing panel Granger causality tests.

The results from the panel Granger causality tests suggest that greater e-government reduces corruption, but not the other way round, while causality between internet adoption and corruption runs in both directions.

The empirical findings highlight the importance of e-government in the battle against corruption. From a policy perspective, e-government is a powerful tool in anti-corruption efforts that needs to be recognized by policymakers. This finding is quite robust to different model specifications and various measures of law enforcement. The driving force of e-government influence on depressing corruption is the telecommunication infrastructure, besides the scope and quality of online services. On the contrary, the impact of the extent of internet adoption on corruption reduction is ambiguous and seems to be sensitive to model specification, in contrast to findings from prior research. Nevertheless, the interaction effects between e-government and internet adoption suggest that a greater number of people with access to the internet strengthens the positive impact of e-government on curbing corruption, implying a complementary relationship between both policy tools that should be regarded in anti-corruption efforts.

Other new findings reveal that inflation variability and trade protectionism do not impact corruption, unlike the findings of prior literature. Furthermore, the persistency of corruption seems highly likely.

The remainder of this paper is organized as follows. Section 2 provides the theoretical background and related literature. Section 3 describes the empirical methodology and data used for empirical analysis. Section 4 proceeds to the results, while Section 5 concludes and discusses the policy implications of the results.

2. THEORETICAL BACKGROUND AND RELATED LITERATURE

E-government can be defined as the use of information and communication technology (ICT) by the government in order to work more effectively, share information, and deliver better services to the public (United Nations Development Program, 2006).[4] It refers to the delivery of federal and local governmental information and services to citizens, businesses, and governmental agencies using the internet or any other digital means. On the other hand, corruption is usually defined as "the misuse of public power, office, or authority for private gains" (UNDP, 2006, p. 2, 2008, p. 18). Corruption is likely to reduce economic growth by depressing investment; distorting public spending and the allocation of resources; weakening public institutions, contract enforceability, and property-rights; increasing income inequality and poverty; allocating talented people to rent-seeking activities rather than to more productive ones; and by raising economic inefficiencies, unpredictability of polices, and political instability (Gupta, Davoodi, & Alonso-Terme, 2002; Mauro, 1995, 2002; Murphy, Shleifer, & Vishny, 1991).

Corruption can be viewed as a problem of asymmetric information and incentives that can be explained by a simple principal-agent-client model. In this model, the elected government officials representing the state and its citizens (the principals) are unable to supply public services to citizens (the clients) and that they have to employ public servants (agents) on their behalf to adequately deliver those services to citizens (Klitgaard, 1988). But, due to asymmetric information, whereby agents know more about the administration than both of the principals and the clients, the agents may act opportunistically in their own interest to take advantage of the entrusted power by engaging in corrupt acts—such as bribery, extortion, fraud, nepotism, and embezzlement (Lio, Liu, & Ou, 2011; United Nations Development Program, 2008)—and that corruption arises, particularly in the existence of lack of accountability. The illicit rent-seeking behavior would be exacerbated with greater monopoly power granted to agents over clients; greater discretionary power delegated to agents; and with weak accountability of agents to the principal.[5] Hence, to combat corruption, it would be vital to restructure the principal-agent-client connection by lessening the amount of discretionary power entrusted to agents and enhancing the accountability of agents to the principal (Klitgaard, 1988). In this regard, e-government can be seen as an effective tool in restructuring the principal-agent-client relationship to reduce corruption by expanding access to information; simplifying rules and procedures and making them more transparent; providing detailed data on transactions and hence easing the process of tracking actions and decisions made by agents; enhancing the questionability of their unreasonable actions; reducing their discretionary power by standardizing the delivery of services; and promoting accountability (Bhatnagar, 2003, p. 30). In addition, it allows maintaining full data on transactions, which increases the rate of detection of corrupt acts.[6] Therefore, e-government may generally create disincentives for government officials to engage in corrupt behavior by increasing the probability of exposure.[7]

However, there has been little research on the empirical evidence of these possible effects of e-government on corruption. At the microeconomic level, Kim et al. (2009) have investigated the development of an anti-corruption system in the Republic of Korea—called online procedures enhancement for civil application (OPEN)—which enables citizens to monitor the progress of their applications in 54 common procedures. They find that corruption was reduced in Seoul Metropolitan Government where this system was implemented.[8] Using a panel dataset consisting of 70 countries and covering the period of 1998–2005 for three independent variables (gross domestic product (GDP) per capita, education, and internet users), Lio et al. (2011) have found that the internet adoption reduces corruption, although the magnitude of the effect is quite small. Furthermore, they argue