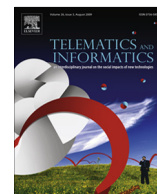




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Does ICT diffusion matter for corruption? An Economic Development Perspective

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ABSTRACT

This study assess the impact of ICT diffusion on corruption by using instrumental variables method on a panel data set of 175 countries over the period 1996–2014. We check for the stability of the ICT-corruption nexus for different levels of economic development. Our results show that ICT diffusion clearly acts as an effective tool to control corruption. The study also reports that as the countries develop economically they improve their corruption level. Moreover, as per the per capita GDP, estimation outcomes suggest that both trade openness and better institutions are associated with lower corruption levels. However, results show robust support to suggest that as the general price level increases, bribery increases. This effect is more pronounced for the developing countries than for developed ones, which may witness higher inflation rates and therefore a higher cost of living. Drawn on our results, our study addresses important insights and policy implications mainly for developing countries.

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1. Introduction

Information and communication technology (ICT) has expanded worldwide and has led to a new economic development path for both developed and developing economies. Most of the world's population now has access to ICT, mainly through mobile phones and internet. This increasing expansion of ICT all over the world has inspired academicians, researchers and policy makers to consider in which ways ICT can be used to improve countries' economic situation. For example, the internet has been rapidly adopted by many governments to establish e-government services in the public administration. As defined in the literature, E-Government is "the application of electronic means in the interaction between governments and citizens and between governments and businesses as well as internal government operations to simplify and improve governance" (Backus, 2001). The implementation of E-government has helped to improve the communication and interaction of governments with their citizens (Mahmood, 2004). Transparency improves the government's accountability. However, a main concern with transparency is that it could be associated with political instability in some cases. Hollyer et al. (2015) show that more transparency through data dissemination in autocratic countries experiencing low growth rates can induce a coordination of citizens' beliefs leading to mass mobilization and regime instability (Hollyer et al., 2015).

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As discussed in [Bussell \(2011\)](#), many driving factors are behind the intensity of ICT adoption worldwide. National characteristics are the main driving key factors in ICT adoption across countries ([Milner, 2006](#)). Moreover, governments use ICT to overcome problems related to inaccessibility, expensiveness, low technical quality, dysfunctionality and unresponsiveness of services to the needs of clientele ([World Bank, 2004](#)). ICT use can help governments communicate more easily with precision, simplicity and more speedily while reducing services delivery related costs.

Recognition of the role of technology in economic activity goes back to the neoclassical growth theory ([Solow, 1956](#)). However, its role in the economy over the years has greatly increased as economies have become more knowledge based ([Katz, 2009](#)). Back in time, [Hardy \(1980\)](#) showed in a study conducted on 60 countries over the period 1968–1976 that telephone use was associated with economic development. The author argue that this association “comes from the telephone’s support of the organization of economic activity”.

Later on, a similar result was documented in [Madden and Savage \(1998\)](#) showing that investment in telecommunications infrastructure in 27 Central and Eastern European countries was positively correlated with economic growth. Also, an empirical country analysis by [Shamim \(2007\)](#) on a sample of 61 countries over the period 1990–2002, showed that ICT diffusion positively impacts financial development and therefore economic growth, a result confirmed later on by [Sassi and Goaid \(2013\)](#). Similarly, [Claessens et al. \(2002\)](#) give support to the existence of this positive effect of ICT on growth potentialities in a sample of 44 African economies over the period 1988–2007, suggesting that countries with well-developed financial systems are likely to have better economic growth potentialities when mobile phone penetration is high. Similar effects of ICT on economic growth performance in various cross country settings and different theoretical frameworks have been documented in numerous other studies ([Lee et al., 2005](#); [Roller and Waverman, 2001](#); [Seo et al., 2009](#), among others).

Beyond this positive impact of ICT on economic growth and economic development in general, numerous studies in the literature have focused on the way ICT could be used to reduce corruption ([Bertot et al., 2010](#); [Anderson, 2009](#); [Kim et al., 2009](#); [Cho and Choi, 2004](#), among others). As defined by Transparency International, corruption is ‘an abuse of entrusted power for private gain’. Another well-known definition by [Bardhan \(1997\)](#) and [Andvig and Fjeldstad \(2001\)](#) delineates corruption as the use of public offices for private enrichment, which could be in the form of bribery, theft, extortion, or fraud in order to further the personal goals of public officials and allow favoritism and extortion.

The most consistent empirical finding about the factors positively or negatively driving corruption, reported that corruption is closely correlated with various aspects of economic development ([Saha and Ben Ali, 2017](#); [Ben Ali and Saha, 2016](#); [Ades and Di Tella, 1999](#); [Sandholtz and Koetzle, 2000](#)). More specifically, corruption can undermine economic growth ([Huang, 2016](#)), increase inflation ([Ben Ali and Sassi, 2016](#)), hamper international trade potentialities ([Ben Ali and Mdhillat, 2015](#); [De Jong and Bogmans, 2011](#)) and cause natural resources curse ([Ben Ali et al., 2016](#)). Numerous studies have also discussed the association of non-economic variables with corruption, such as the impact of various institutional aspects of a society, such as the administrative centralization, democracy and the rules of law ([Ben Ali and Krammer, 2016](#); [Iwasaki and Suzuki, 2012](#); [Alt and Lassen, 2003](#); [Herzfeld and Weiss, 2003](#)). With the emergence of the internet, many academicians and policymakers have highlighted the role it can perform in helping curbing corruption in developing countries, by facilitating information sharing between citizens and government bodies and by enabling more transparency and accountability. Internet and phone applications are the main vehicles since they increase networking capacity and reduce information transaction costs ([Pirannejad, 2011](#)).

As far as political corruption is concerned, studies showed that ICT investment has contributed to reducing corruption in many emerging and developing economies ([Ben Ali and Sassi, 2017](#); [Soper, 2007](#)). Specifically, it has been suggested that countries endowed with more information and communication technology would have lower corruption levels. In a study on more than 100 countries over a 10 years period, [Anderson \(2009\)](#) provides evidence that E-government adoption reduces corruption. Similar results have been reported by [Shim and Eom \(2009\)](#). Also, [Kim et al. \(2009\)](#) showed that the adoption of the Online Procedures Enhancement for Civil Application was a key element in reducing corruption in Seoul. Similarly, in their cross-country study, [Lio et al. \(2011\)](#) empirically tested the effect of internet adoption in 70 countries over the period from 1998 to 2005. Their results show the existence of a causality running from internet adoption to corruption reduction. They show that on average, a 10 per cent increase in the number of internet users per 100 inhabitants raised the perception of corruption index by 0.05 points. An increase raise in this index signifies a decrease in corruption since the corruption perception index ranges from 0 to 10 where the minimum value corresponds to the highest level of corruption and the maximum value to a clean country.

According to [Klitgaard \(1988\)](#), corruption is more likely to occur when an official enjoy monopoly power over clients and when decisions in an administration are taken on a discretionary basis without sufficient accountability. [Shim and Eom \(2009\)](#) studied the correlation between the use of ICT (as measured by the United Nations e-participation index) and the level of corruption as proxied by the *Transparency International* corruption perception index. Their results suggest that e-government is associated with lower levels of corruption. Similar results have been confirmed by [Garcia-Murillo \(2013\)](#) who reported the presence of a negative association between the existence of government innovations (measured by the United Nations e-government index and the United Nations telecommunications and infrastructure index) and the level of corruption. According to this study, e-government presence clearly reduces the perception of corruption in a country. Indeed, using ICT contributes to automating governmental administrative processes, cutting out involvement

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