Internet Diffusion and Government Corruption in Latin America and Sub-Saharan Africa

Completed Research Paper

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ABSTRACT

In this paper we examine relationships among Internet diffusion, voice and accountability, and government corruption based on data from Latin American and Sub-Saharan African countries. Our study suggests that greater levels of Internet diffusion are associated with greater levels of voice and accountability, and that greater levels of voice and accountability are associated with lower levels of government corruption. Also, there seems to be an overall relationship between Internet diffusion and government corruption, which is primarily indirect and mediated by voice and accountability. Our results also suggest that, for each additional 15 Internet users per 100 inhabitants in a country in these regions, there is approximately a 35 percent decrease in government corruption, mediated by an increase in voice and accountability.

Keywords (Required)

Latin America, Sub-Saharan Africa, Government Corruption, Voice and Accountability, Internet Diffusion.

INTRODUCTION

The study of government corruption and its antecedents has been gaining increasing attention due to a number of reasons. One of the most important of these reasons is the increasingly important role of globalization in defining the socio-economic conditions of both developed and developing countries (Rothstein, 2011). The levels of globalization seen today are in part due to the advent and widespread use of the Internet (Akpan, 2003; Darley, 2003; Qureshi, 2011). Interestingly, Internet use may also be associated with another factor that seems to strongly influence the socio-economic conditions of both developed and developing countries – government corruption. In this context, Internet use may act as a mitigating factor, reducing government corruption (Garcia-Murillo, 2010).

The relatively low cost of Internet access has led to its growing use in government initiatives (Henriksen & Damsgaard, 2007). While these initiatives can themselves help reduce government corruption (Shim & Eom, 2008; 2009), one of the most promising ways in which diffusion of Internet access (i.e., "Internet diffusion") can mitigate government corruption may be by increasing the extent to which a country's citizens are able to participate in the country's governance by examining several aspects of a country's political processes. These include civil liberties, political rights, and a free media (Jakopin & Klein, 2011; Perez & Ben-David, 2012). That is, Internet diffusion can mitigate government corruption (Garcia-Murillo, 2010) by increasing what is known as "voice and accountability", or the extent to which a country's citizens are able to participate in the country's governance (Kaufmann et al., 2009).

We examine the relationships among Internet diffusion, voice and accountability, and government corruption. Following Darley (2003) and Musa et al. (2005), our focus is on developing countries in the Sub-Saharan African region, as well as in a "matched" developing region of increasing importance in the world, namely Latin America. Central to our investigation are the predictions that one will find a negative overall relationship between Internet diffusion and government corruption (i.e., more Internet diffusion leading to less government corruption) in both Latin American and Sub-Saharan African countries, and that this relationship will be indirect and mediated by voice and accountability.

HYPOTHESES

Jakopin & Klein (2011) found a significant bivariate association between Internet diffusion and voice and accountability; this association was primarily related to fixed, as opposed to mobile, Internet diffusion. They found no association between these two variables, however, in a multivariate analysis where voice and accountability was hypothesized to predict Internet diffusion. These results, when combined, suggest the existence of a possible association between Internet diffusion and voice and accountability where Internet diffusion is the predictor instead of the criterion. This expectation is generally consistent with qualitative studies conducted by Pirannejad (2011) in Iran, and Perez & Ben-David (2012) in India, as well as with a survey-based study conducted by Cuillier & Piotrowski (2009). This expectation is formalized through hypothesis H1; which, like the other hypotheses guiding our investigation, is framed within the context of Latin American and Sub-Saharan African countries.

H1: *Greater levels of Internet diffusion in Latin American and Sub-Saharan African countries will be associated with greater levels of voice and accountability.*

Sung (2012) conducted a longitudinal study of 204 countries, where the study was originally formulated to assess the role of women in government corruption. The study found no relationship between gender and government corruption, but did find a significant association between voice and accountability and government corruption, with voice and accountability appearing to be the predictor. This finding is consistent with the results of an earlier longitudinal study of 170 countries by Fredriksson et al. (2007). This possible causal link between voice and accountability and government corruption is also consistent with the results of a focused study in the country of Armenia conducted by Coxson (2009), as well as with the outcomes of an extensive review of the government corruption literature by Rothstein (2011). Hypothesis H2 formalizes this link in the context of our investigation.

H2: *Greater levels of voice and accountability in Latin American and Sub-Saharan African countries will be associated with lower levels of government corruption.*

An econometrics analysis conducted by Andrei et al. (2009) suggested that voice and accountability partially predicts government corruption, together with political pressure and quality of government employees' job-related relationships. Given the possible link between Internet diffusion and voice and accountability, this may be one of the underlying reasons for the overall link between Internet diffusion and government corruption suggested by a cross-sectional study of 170 countries conducted by Garcia-Murillo (2010). That is, Internet diffusion may exert its effect on government corruption primarily in an indirect way, by allowing a country's citizens to more actively participate in the country's governance.

A consistent finding in the research literature on the impacts of Internet-based communication technologies is that those technologies usually exert effects through key intermediate variables (Kock & DeLuca, 2007). This happens as individuals and groups adapt Internet-based communication technologies to carry out specific processes and achieve their goals (Kock et al., 2006). Given this, the apparently strong causative association between Internet diffusion and voice and accountability (Jakopin & Klein, 2011), and the critical role that voice and accountability seems to play in the reduction of government corruption (Rothstein, 2011), a reasonable expectation can be hypothesized. The expectation is that Internet diffusion will affect government corruption primarily in an indirect way (Garcia-Murillo, 2010), via an intermediate effect on voice and accountability, which is formalized through hypothesis H3.

H3: *The relationship between Internet diffusion and government corruption in Latin American and Sub-Saharan African countries will be indirect and mediated by voice and accountability.*

The three hypotheses above provide a novel, important and parsimonious framework for the examination of the associations among Internet diffusion, voice and accountability, and government corruption in Latin American and Sub-Saharan African countries. This framework may explain a number of previous findings, and form a basis for future research. It can be expressed through a causal model, shown in Figure 1, which provides the basis for a test whereby quantitative data will be analyzed using the method of path analysis (Hair et al., 2009; McDonald, 1996).

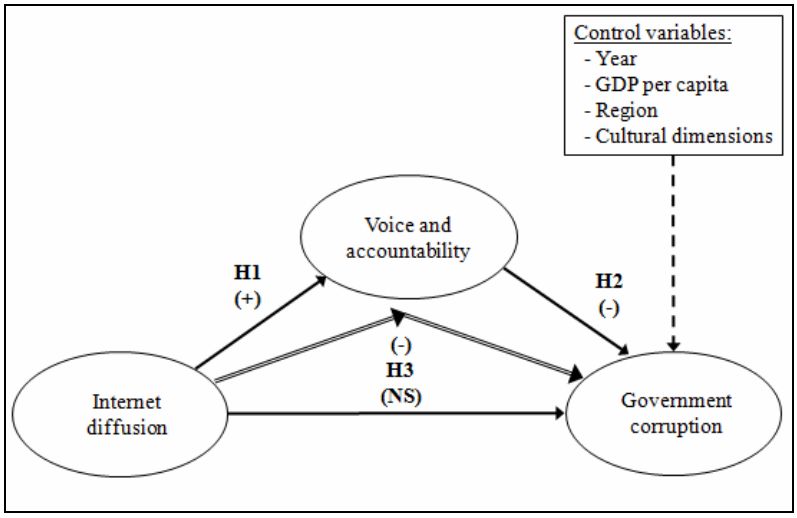

Figure 1: Model with hypotheses

Notes:
(+) or (-) = significant positive or negative, respectively, association
NS = Non-significant association

The model depicts hypotheses H1 and H2 employing the symbols "(+)" and "(-)" to refer to the positive and negative (or direct and inverse) relationships that are predicted through the hypotheses. Hypothesis H3 is depicted in a more complex way, through a double-lined arrow above the hypothesis and a single-lined arrow below it. The double-lined arrow represents the indirect relationship between Internet diffusion and government corruption, mediated by voice and accountability. This indirect relationship is hypothesized to be negative, hence the symbol "(-)". This indirect relationship is also hypothesized to capture the association between Internet diffusion and government corruption, or to fully mediate it (Preacher & Hayes, 2004), thus rendering the competing direct relationship represented by single-lined arrow non-significant, hence the symbol "(NS)".

Four control variables are also included in the model, and listed within the rectangle symbol: year (2006-2010), GDP per capita, region (Latin America=1 and Sub-Saharan Africa=0), and four cultural dimensions from Hofstede's (2001) framework for which country scores in these two regions were available. The meaning of including these control variables is that the hypothesized effects are expected to hold regardless of variations in those control variables. That is, the hypothesized effects are expected to hold regardless of year, GDP per capita, region, and cultural dimensions; when those variables are controlled for with respect to government corruption.

METHOD

Internet diffusion was measured by the number of Internet users per 100 inhabitants in a country, obtained from the World Bank (http://www.worldbank.org). Voice and accountability was measured through the eponymous index, also from the World Bank. Government corruption was measured through the Corruption Perceptions Index published by Transparency International (http://www.transparency.org). The Corruption Perceptions Index scores were reversed, through multiplication by -1, so as to properly reflect the degree of corruption of countries; as opposed to reflecting the lack of corruption, as the original scores do, which could cause model interpretation problems. The data covers 47 countries, 24 of which in Latin America and 23 in Sub-Saharan Africa; and spans 5 years, ranging from 2006 to 2010. This added up to a total sample size of 47 x 5 = 235 data points.

The data was analyzed using the method of path analysis (Hair et al., 2009; McDonald, 1996). We used the multivariate statistical analysis software WarpPLS 3.0 (Kock, 2012), which allowed us to conduct a robust path analysis whereby P values associated with various coefficients were calculated using a nonparametric resampling technique known as bootstrapping (Diaconis & Efron, 1983). Indirect coefficients of association were also calculated (Bollen & Stine, 1990), together with their respective P values, as well as Cohen's (1988) *f*-squared effect sizes. Model validation was based on the calculation of Stone-Geisser Q-squared coefficients (Geisser, 1974; Stone, 1974), as well as block and full collinearity variance inflation factors (Kock & Lynn, 2012).

The Latin American countries included were Argentina, Barbados, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Portugal, Trinidad and Tobago, Uruguay, and Venezuela. The Sub-Saharan African countries included were Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Chad, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Nigeria, South Africa, Suriname, Tanzania, Uganda, Zambia, and Zimbabwe.

VALIDATION

Stone-Geisser Q-squared coefficients (Geisser, 1974; Stone, 1974) are shown in Table 1 for each of the two endogenous variables in the path model. The Q-squared coefficient is a nonparametric measure, traditionally calculated via blindfolding, which is used for the assessment of the predictive validity (or relevance) associated with each variable block in a path model, through the endogenous variable that is the criterion variable in the block. Acceptable predictive validity in connection with an endogenous variable is suggested by a Q-squared coefficient greater than zero (Kock, 2012). Since this is the case for the two endogenous variables in the model, it can be concluded that the model presents acceptable predictive validity.

Voice and accountability	Government corruption
0.324	0.689

Table 1: Stone-Geisser Q-squared coefficients

Block variance inflation factors were calculated for each variable with two or more predictors. That is, for each variable block in which two or more predictors point at an endogenous variable. There was only one such block in our model. The variance inflation factors are shown in Table 2, where each variance inflation factor shown is associated with one of two predictors, and relates to the link between that predictor and its criterion variable. In this context, a variance inflation factor is a measure of the degree of vertical collinearity (Kock & Lynn, 2012), or redundancy, among the variables that are hypothesized to affect another variable in a block. Variance inflation factors of 3.3 or lower suggest the existence of no vertical collinearity in a variable block (Cenfetelli & Bassellier, 2009; Petter et al., 2007; Kock & Lynn, 2012). Since this is the case here, it can be concluded that the model is free from vertical collinearity.

	Internet diffusion	Voice and accountability
Government corruption	2.624	2.051

Table 2: Block variance inflation factors

Variance inflation factors were also calculated simultaneously for all variables, separately from the variance inflation factors calculated for two or more predictor variables in individual variable blocks. These variance inflation factors, reported in Table 3, were calculated based on a full collinearity test (Kock & Lynn, 2012). This test enables the identification of not only vertical but also lateral collinearity, which is collinearity among predictor-criterion variable pairs. This test also allows for an assessment of collinearity involving all variables in a model, including control variables. The variance inflation factor threshold used here is the same as that used in the vertical collinearity test. That is, variance inflation factors of 3.3 or lower suggest the existence of no model-wide multicollinearity (Cenfetelli & Bassellier, 2009; Petter et al., 2007; Kock & Lynn, 2012). Since this is the case here for all variables, it can be concluded that results of our analysis have not been biased by model-wide multicollinearity.

Internet diffusion	2.663
Voice and accountability	3.240
Government corruption	3.200
Year (2006-2010)	1.142
GDP per capita	2.684
Region (Latin America=1 and Sub-Saharan Africa=0)	2.522
Cultural dimension 1: Power distance	1.949
Cultural dimension 2: Uncertainly avoidance	1.622
Cultural dimension 3: Long-term/short-term orientation	1.654
Cultural dimension 4: Individualism/collectivism	2.136

Table 3: Full collinearity variance inflation factors

In summary, based on the tests above, it can be concluded that in terms of the measures used the model presents acceptable predictive validity, is free from vertical collinearity, and is free from model-wide multicollinearity. These tests, particularly the tests addressing vertical and full collinearity, relied on conservative multivariate data analyses criteria (Hair et al., 2009; Kock & Lynn, 2012). Based on them, we can expect the results of the path analysis to be generally unbiased with respect to the data validation tests performed.

RESULTS

The model with the main results is shown in Figure 2. The beta coefficients are standardized partial regression coefficients, provided for each predictor-criterion variable pair. Beta coefficients noted with the symbol "***" are statistically significant at the P < .001 level. The beta coefficient noted with the symbol "NS" refers to a statistically non-significant association. R-squared coefficients are shown next to criteria (a.k.a. endogenous) variables. They reflect the percentage of explained variance for those variables by their predictors in each variable block.

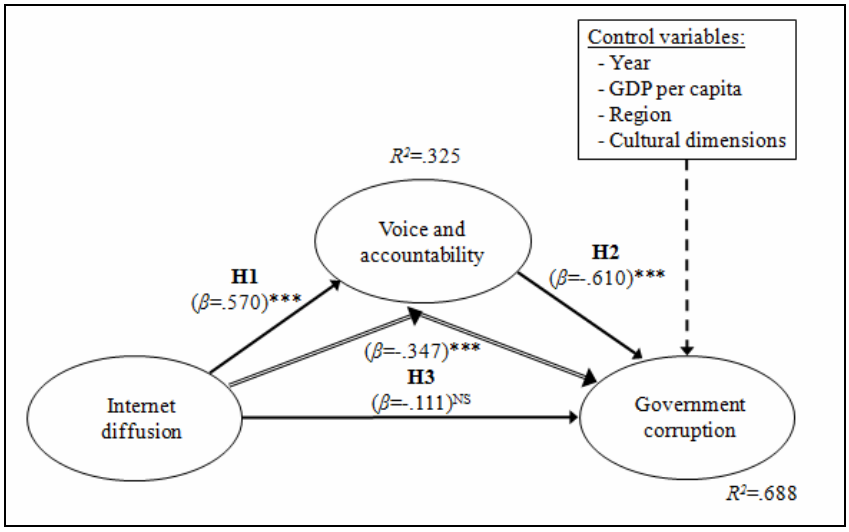

Figure 2: Model with results

Notes: NS = Non-significant association, *** = P<.001

Greater levels of Internet diffusion in Latin American and Sub-Saharan African countries were associated with greater levels of voice and accountability (β=.570, P<.001, f^2=.325), supporting hypothesis H1. Greater levels of voice and accountability were associated with lower levels of government corruption (β=-.610, P<.001, f^2=.481), supporting H2. As indicated by the f^2 coefficients (Cohen, 1988; Kock, 2012), the association between Internet diffusion and voice and accountability (f^2=.325) had a medium effect size (i.e., .150≤ f^2 ≤.350), and the association between voice and accountability and government corruption (f^2=.481) had a large effect size (i.e., f^2 >.350).

The indirect association between Internet diffusion and government corruption was found to be significant (β=-.347, P<.001, f^2=.166). The beta coefficient associated with this indirect association was calculated as the product of the two direct associations' beta coefficients, for the two path segments that make up the indirect association (Bollen & Stine, 1990; Kock, 2012). Moreover, the direct association between Internet diffusion and government corruption was found to be non-significant (β=-.111, NS, f^2=.053). Together, these two findings suggest that the relationship between Internet diffusion and government corruption in Latin American and Sub-Saharan African countries was indirect and mediated by voice and accountability (Preacher & Hayes, 2004), supporting H3. As indicated by the f^2 coefficient for the indirect association (f^2=.166), this association had a medium effect size (i.e., $.150 \leq f^2 \leq .350$).

Since we controlled for the effects of several variables with respect to government corruption, we can say that the findings summarized above hold regardless of variations in those variables. The control variables in question are year (2006-2010), GDP per capita, region (Latin America=1 and Sub-Saharan Africa=0), and cultural dimensions.

DISCUSSION

All three hypotheses were supported. Supporting hypothesis H1, the results suggested that greater levels of Internet diffusion in Latin American and Sub-Saharan African countries were associated with greater levels of voice and accountability. Supporting H2, greater levels of voice and accountability were associated with lower levels of government corruption. Finally, supporting H3, the indirect association between Internet diffusion and government corruption was found to be significant, and the direct association between Internet diffusion and government corruption was found to be non-significant.

The beta coefficients shown earlier for each predictor-criterion variable pair reflect the multivariate-adjusted variation in the criterion variable, in number of standard deviations, associated with one standard deviation variation in each of its predictor variables. We can combine those beta coefficients with the descriptive statistics to get a better sense of the effects suggested by them.

The standard deviation of Internet diffusion was 15.155 users by 100 inhabitants of a country. Therefore, we can conclude that for each additional 15 Internet users per 100 inhabitants in a country there is approximately a 57 percent increase in voice and accountability, considering the average level of voice and accountability in the sample as the baseline.

We can additionally conclude that a country where Internet diffusion is very high (74.248 Internet users by 100 inhabitants) is likely to present a level of voice and accountability that is approximately 278 percent higher {calculated as: (74.248-0.313) / 15.155 x 0.57 x 100} than a country where Internet diffusion is very low (.313 Internet users by 100 inhabitants).

We can also conclude that for each additional 15 Internet users per 100 inhabitants in a country there is a 34.7 percent decrease in government corruption, mediated by an increase in voice and accountability, considering the average level of government corruption in the sample as the baseline.

Finally, we can conclude that a country where Internet diffusion is very high (74.248 Internet users by 100 inhabitants) is likely to present a level of government corruption that is approximately 12.5 percent {calculated as: $(1-.347)^{(74.248-0.313)/15.155}$ x 100} of the level in a country where Internet diffusion is very low (.313 Internet users by 100 inhabitants).

CONCLUSION

Our study focused on the relationships among Internet diffusion, voice and accountability, and government corruption in Latin American and Sub-Saharan African countries. The data used was obtained from the World Bank (http://www.worldbank.org), Transparency International (http://www.transparency.org), and Hofstede's (1983; 2001) cultural dimensions framework. It covers 47 countries, 24 of which in Latin America and 23 in Sub-Saharan Africa; and spans 5 years, ranging from 2006 to 2010.

The data was analyzed using the method of path analysis, and its results suggest that Internet diffusion has strong direct and indirect relationships, respectively, with voice and accountability and government corruption. Voice and accountability seems to have a strong direct relationship with government corruption; a relationship that appears to fully mediate the indirect relationship between Internet diffusion and government corruption.

According to our analyses, each additional increment of about 150 Internet users per 1000 people in a country (or 15 users per 100 people) was associated with a 57 percent increase in voice and accountability. A country with about 742 Internet users per 1000 people is likely to present a level of voice and accountability that is approximately 278 percent higher than a country with about 3 Internet users per 1000 people.

Each additional increment of about 150 Internet users per 1000 people in a country was associated with a 34.7 percent decrease in government corruption, with this association being mediated by an increase in voice and accountability. A country with about 742 Internet users per 1000 people is likely to present a level of government corruption that is approximately 12.5 percent (a little over one-tenth) the level of a country with about 3 Internet users per 1000 people.

One of the motivations for our study was the possible perpetuation of the vicious circle of underdevelopment and government corruption in developing countries, which Musa et al. (2005) argued was due to a certain resistance among developing countries against the introduction of technologies that can be used to fight corruption, such as Internet-based technologies. Our study suggests that this is not the case.

It seems that Internet diffusion can significantly reduce government corruption in developing countries. But this effect is an indirect one, via voice and accountability, or the extent to which a country's citizens are able to participate in the country's governance.

REFERENCES

1. Akpan, P.I. (2003). Basic-needs to globalization: Are ICTs the missing link? *Information Technology for Development*, 10(4), 261-274.
2. Andrei, T., Stancu, S., Nedelcu, M., & Matei, A. (2009). Econometric models used for the corruption analysis. *Economic Computation and Economic Cybernetics Studies and Research*, 43(1), 101-122.
3. Bollen, K.A., & Stine, R. (1990). Direct and indirect effects: Classical and bootstrap estimates of variability. *Sociological Methodology*, 20(2), 115–140.
4. Cenfetelli, R., & Bassellier, G. (2009). Interpretation of formative measurement in information systems research. *MIS Quarterly*, 33(4), 689-708.
5. Cohen, J. (1988). Statistical power analysis for the behavioral sciences. Hillsdale, NJ: Lawrence Erlbaum.
6. Coxson, S.L. (2009). Assessment of Armenian local government corruption potential. *Public Administration & Development*, 29(3), 193-203.
7. Cuillier, D., & Piotrowski, S. J. (2009). Internet information-seeking and its relation to support for access to government records. *Government Information Quarterly*, 26(3), 441-449.
8. Darley, W.K. (2003). Public policy challenges and implications of the Internet and the emerging e-commerce for sub-Saharan Africa: A business perspective. *Information Technology for Development*, 10(1), 1-12.
9. Diaconis, P., & Efron, B. (1983). Computer-intensive methods in statistics. *Scientific American*, 249(1), 116-130.
10. Fredriksson, P.G., Neumayer, E., & Ujhelyi, G. (2007). Kyoto Protocol cooperation: Does government corruption facilitate environmental lobbying? *Public Choice*, 133(1), 231-251.
11. Garcia-Murillo, M. (2010). The Effect of Internet Access on Government Corruption. *Electronic Government*, 7(1), 22-40.
12. Geisser, S. (1974). A predictive approach to the random effects model. *Biometrika*, 61(1), 101-107.
13. Hair, J.F., Black, W.C., Babin, B.J., & Anderson, R.E. (2009). *Multivariate data analysis*. Upper Saddle River, NJ: Prentice Hall.
14. Hamilton, D. (1987). Sometimes $R^2 > r^2_{yx1} + r^2_{yx2}$: Correlated variables are not always redundant. *The American Statistician*, 41(2), 129-132.
15. Henriksen, H.Z., & Damsgaard, J. (2007). Dawn of e-government - an institutional analysis of seven initiatives and their impact. *Journal of Information Technology*, 22(1), 13-23.
16. Hofstede, G. (1983). The cultural relativity of organizational practices and theories. *Journal of International Business Studies*, 14(2), 75-90.
17. Hofstede, G. (2001). Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations. Thousand Oaks, CA: Sage Publications.
18. Jakopin, N.M., & Klein, A. (2011). Determinants of broadband internet access take-up: Country level drivers. *Journal of Policy, Regulation and Strategy for Telecommunications, Information and Media*, 13(5), 29-47.
19. Kaufmann, D., Kraay, A., & Mastruzzi, M. (2009). *Governance matters VIII: Aggregate and individual governance indicators, 1996-2008*. World Bank Policy Research Working Paper 4978. Washington, DC: World Bank.

20. Kessing, S.G., Konrad, K.A., & Kotsogiannis, C. (2007). Foreign direct investment and the dark side of decentralization. *Economic Policy*, 22(49), 6-70.
21. Kline, R.B. (1998). *Principles and practice of structural equation modeling*. New York, NY: The Guilford Press.
22. Kock, N. & Lynn, G.S. (2012). Lateral collinearity and misleading results in variance-based SEM: An illustration and recommendations. *Journal of the Association for Information* Systems, 13(7), 546-580.
23. Kock, N. (2012). *WarpPLS 3.0 User Manual*. Laredo, Texas: ScriptWarp Systems.
24. Kock, N., & DeLuca, D. (2007). Improving business processes electronically: An action research study in New Zealand and the US. *Journal of Global Information Technology Management*, 10(3), 6-27.
25. Kock, N., Del Aguila-Obra, A.R., & Padilla-Meléndez, A. (2009). The information overload paradox: A structural equation modeling analysis of data from New Zealand, Spain and the U.S.A. *Journal of Global Information Management*, 17(3), 1-17.
26. Kock, N., Lynn, G.S., Dow, K.E., & Akgün, A.E. (2006). Team adaptation to electronic communication media: Evidence of compensatory adaptation in new product development teams. *European Journal of Information Systems*, 15(3), 331-341.
27. Macrae, J. (1982). Underdevelopment and the economics of corruption: A game theory approach. *World Development*, 10(8), 677-687.
28. Maruyama, G.M. (1998). *Basics of structural equation modeling*. Thousand Oaks, CA: Sage Publications.
29. McDonald, R.P. (1996). Path analysis with composite variables. *Multivariate Behavioral Research*, 31 (2), 239-270.
30. Musa, P.F., Meso, P., & Mbarika, V.W. (2005). Toward sustainable adoption of technologies for human development in Sub-Saharan Africa: Precursors, diagnostics, and prescriptions. *Communications of the Association for Information Systems*, 15(33), 592-608.
31. Perez, Y.V. & Ben-David, Y. (2012). Internet as freedom – does the internet enhance the freedoms people enjoy? *Information Technology for Development*, 18(4), 293-310.
32. Petter, S., Straub, D., & Rai, A. (2007). Specifying formative constructs in information systems research. *MIS Quarterly*, 31(4), 623-656.
33. Piranneiad, A. (2011). The effect of ICT on political development: A qualitative study of Iran. *Information Development*, 27(3), 186-195.
34. Preacher, K.J., & Hayes, A.F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, 36 (4), 717-731.
35. Qureshi, S. (2011). Globalization in development: Do information and communication technologies really matter? *Information Technology for Development*, 17(4), 249-252.
36. Rothstein, B. (2011). The quality of government: Corruption, social trust, and inequality in international perspective. Chicago, IL: University of Chicago Press.
37. Shim, D. C., & Eom, T. H. (2009). Anticorruption effects of information communication and technology (ICT) and social capital. *International Review of Administrative Sciences*, 75(1), 99-116.
38. Shim, D.C., & Eom, T.H. (2008). E-government and anti-corruption: Empirical analysis of international data. *International Journal of Public Administration*, 31(3), 298-316.
39. Stone, M. (1974). Cross-validatory choice and assessment of statistical predictions. *Journal of the Royal Statistical Society, Series B*, 36(1), 111–147.
40. Sung, H.-e. (2012). Women in government, public corruption, and liberal democracy: A panel analysis. *Crime, Law and Social Change*, 58(3), 195-219.
41. Treisman, D. (2007). What have we learned about the causes of corruption from ten years of cross-national empirical research? *Annual Review of Political Science*, 10(1), 211-244.