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The Mobile Phone in the Diffusion of Knowledge for Institutional Quality in Sub-Saharan Africa

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Summary. — This study assesses the mobile phone in the diffusion of knowledge for better governance in Sub-Saharan Africa from 2000 to 2012. For this purpose we employ Generalised Method of Moments with forward orthogonal deviations. The empirical evidence is based on three complementary knowledge diffusion variables (innovation, internet penetration and educational quality) and 10 governance indicators that are bundled and unbundled. The following are the main findings. *First*, there is an unconditional positive effect of mobile phone penetration on good governance. *Second*, the net effects on political, economic, and institutional governances that are associated with the interaction of the mobile phone with knowledge diffusion variables are positive for the most part. *Third*, countries with low levels of governance are catching-up their counterparts with higher levels of governance. The above findings are broadly consistent with theoretical underpinnings on the relevance of mobile phones in mitigating bad governance in Africa. The evidence of some insignificant net effects and decreasing marginal impacts may be an indication that the mobile phone could also be employed to decrease government quality. Overall, this study has established net positive effects for the most part. Five rationales could elicit the positive net effects on good governance from the interaction between mobile phones and knowledge diffusion, among others, the knowledge variables enhance: reach, access, adoption, cost-effectiveness, and interaction. In a nut shell, the positive net effects are apparent because the knowledge diffusion variables complement mobile phones in reducing information asymmetry and monopoly that create conducive conditions for bad governance. The contribution of the findings to existing theories and justifications of the underlying positive net effects are discussed.
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Key words — mobile phones, governance, Africa

1. INTRODUCTION

Positioning an inquiry on the relevance of knowledge diffusion in mobile phone penetration [1] for institutional quality in sub-Saharan Africa (SSA) is motivated by at least six important strands in recent literature.

First, the phenomenon of globalization is now an ineluctable process whose challenges can be neglected only by sacrificing the prosperity of nation states. Accordingly, there is a growing consensus in the literature that in the current era of globalization, for nations to be competitive and well-integrated into the global economy, they need competitive edges in a number of fields (Asongu, 2015a; Oluwatobi, Efobi, Olurinola, & Alege, 2015; Tchamyou, 2016). According to the narrative, competition in the 21st century is fundamentally centered on the ability of a nation to acquire and diffuse new knowledge. The concept of the knowledge economy (KE) has been mastered by Europe and North America which are inexorably setting the course of development in the international arena. Moreover, the historic pattern formulated by Japan has influenced the KE courses of Malaysia, China and the Newly Industrialized Economies of Asia (Hong Kong, Singapore, South Korea and Taiwan). Whereas other Asian and Latin American nations have been responding in calculated strategies that articulate the quest for KE in their growing pursuits of national and regional initiatives, the overall knowledge index of Africa has been dropping (see Anyanwu, 2012; Asongu, 2015b). It follows that there is a policy syndrome of KE in African countries when compared with their developed and developing counterparts.

Second, in terms of mobile phones, frontier markets of Europe, Asia and North America have been witnessing some stabilization in growth (Asongu, 2015a). This trend is in accordance with Penard, Poussing, Yebe, and Ella (2012) who concluded that, as of 2010, penetration rates of the internet and mobile phones in Africa were not symmetrical. According to the authors, while mobile and internet penetration rates have attained saturation points in developed countries, African nations are currently experiencing some asymmetric development in the engaged information and communication technologies (ICTs), notably with 41% (9.6%) for mobile (internet) penetration. In the light of this fact, it is apparent that the mobile phone still has important potentials in Africa, which could represent significant development opportunities if well-tailored toward critical development outcomes.

Third, there are growing requests in scholarly and policy-making circles for the mobile phone not to be considered as a silver bullet of development (see Asongu & De Moor, 2015; Mpogole, Usanga, & Tedre, 2008, p. 71). Within this skeptical framework, authors have recommended more scholarly research on the development outcomes of mobile phones.

Fourth, a World Bank report of April 2015 on Millennium Development Goals (MDGs) shows that poverty has been decreasing in all regions of the world, with the exception of SSA, where about 45% of countries in the sub-region are still far from reaching the MDGs extreme poverty target (see World Bank, 2015). This dismal evidence substantially contrasts with the sub-region enjoying more than two decades of growth resurgence that began in the mid 1990s (see Fosu, 2015a, p. 44). The immiserizing growth in the sub-region has also motivated a recent stream of institutional literature;

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notably, some recent books by (i) Fosu (2015b, chap. 1) on the nexus between growth and institutions in African development which aims to elicit whether the recent growth resurgence experienced by the sub-region is a myth or a reality and (ii) Kuada (2015) on the need to lay more emphasis on soft economics or human capability development in order to understand development trends in the sub-region.

Fifth, government quality has been documented in recent literature to be strongly associated with inclusive growth, notably, in improving standards of living through more efficient allocation of economic resources (Anyanwu & Erhijakpor, 2014; Fonchingong, 2014; Fosu, 2013) and in consolidating the basis of social change (Efobi, 2015).

Sixth, the growing literature on development outcomes from mobile phone penetration has scarcely engaged the effect on government quality in the sub-region, in spite of the documented role of mobile phones (Asongu, 2015c) and quality of institutions (Fosu, 2015b, chap. 1) in inclusive development. In essence, to the best of our knowledge there are currently only four studies that have been positioned on the role of mobile phones in institutional quality in Africa (Gagliardone, 2015; Matthias, 2012; Porter *et al.*, 2016; Snow, 2009). Snow (2009) established a negative link between a nation's mobile phone penetration rate and her perceived corruption level. The growing role of connectivity in consolidating accountability in Africa was documented by Matthias (2012). The connection between government quality and mobile–radio interactions was assessed by Gagliardone (2015) who concluded that the underlying interactions can significantly enhance government's efforts toward more corrective and preventive measures in Kenya. The inquiry by Porter *et al.* (2016) on South Africa, Malawi, and Ghana established that the burgeoning mobile usage by the youth on the continent has potentials to be tailored toward greater harmony between practice and policy.

Noticeably, the discussed literature leaves room for improvement in at least five areas. *First*, contrary to engaged country-specific studies that are characterized with policy implications of limited scope, it is important to position inquiries on broader sets of countries for results with policy outcomes of greater application scope (see Porter *et al.*, 2016; Snow, 2009). *Second*, the engaged literature has focused on limited dimensions of government quality. This is the case with Snow (2009) who focuses on corruption which is only one aspect of institutional governance. *Third*, some inquiries have either not directly linked institutional quality to policy outcomes (see Porter *et al.*, 2016) or not directly focused on the employment of mobile phones for greater government quality (see Gagliardone, 2015). *Fourth*, some findings have cautious policy implications because the underlying empirical analyses are statistically fragile. For example, whereas Snow (2009) argued that there is a negative relationship between mobile phones and corruption, his findings should be welcomed with caution because they are not based on causality but on correlations. *Fifth*, on the complementarity between KE and mobile phones, Gagliardone (2015) has used mobile–radio interactions. We employ three KE variables.

The present study addresses the above first-four gaps by assessing the role of the mobile phone in the diffusion of knowledge for government quality in SSA. The empirical evidence is based on a panel of 49 African countries and an endogeneity-robust Generalised Method of Moments (GMM) with forward orthogonal deviations. The knowledge diffusion variables on which the mobile phone is interacted in order to address the fifth gap are: education, innovation, and internet penetration. Ten governance indicators are used consisting of six unbundled variables (voice & accountability, political stability/no violence, corruption-control, rule of law, government effectiveness, and regulation quality) and four bundled indicators (political, economic, institutional, and general governance dynamics). The purpose of bundling and unbundling governance indicators is to avail room for robustness and more policy implications.

The rest of the study is structured as follows. In Section 2, we clarify the concepts of governance and mobile (m)-governance on the one hand and present the intuition and theoretical underpinnings on the other hand. The data and methodology are covered in Section 3. Section 4 presents and discusses the empirical results while Section 5 concludes with policy implications and future research directions.

2. CLARIFICATION OF GOVERNANCE CONCEPTS AND THEORETICAL HIGHLIGHTS

(a) *Intuition and theory*

Consistent with Hellstrom (2008), ICTs are important instruments for improving governance because they enhance accountability, openness, transparency and the free-flow of information between various departments and institutions within a government. The narrative shows that mobile phones also facilitate information diffusion between the government and citizens on the one hand and the direct participation of citizens in the making of decisions that affect their livelihoods on the other. In summary, the above are also achieved by the overall appeal of the mobile phone in converging societies for better connection, participation, innovation and information.

With the above intuition in mind, Snow (2009, pp. 337–339) has documented theoretical underpinnings linking the mobile phone to better government quality. According to the theory, the historic dearth of ICTs in Africa endowed the elite with preferential ICT facilities. This edge in ICTs substantially constrained transparency and accountability in the management of government offices. Hence, the elite were confronted with good conditions for corruption and mismanagement of public goods. Conversely, with the rapid and massive diffusion of ICTs in general and mobile telephony in particular, opportunities for rent-seeking and capitalizing on information asymmetry for corrupt purposes are being increasingly reduced. In essence, the author postulates that decentralization of ICT has broken secrecy barriers that until now have prevented, *inter alia*: the detection of corruption in public/private circles as well as oversight and punishment of corrupt officials. In a nutshell, the logic underpinning this theory essentially builds on the intuition discussed by Hellstrom (2008), notably: the mobile has substantially reduced the longstanding monopoly of information by the elite which resulted in corrupt behavior and mismanagement.

(b) *Clarification of Governance and Mobile (m)-governance Concepts*

This section is engaged in four principal strands, namely: (i) the concept of (m)-governance, (ii) definitions of governance accepted in recent literature, (iii) debates on the quality of mainstream governance indicators and (iv) the policy relevance of bundling and unbundling institutions.

The *first* aspect clarifies the concept of m-governance. In accordance with Hellstrom (2008), m-governance should be understood as the use of ICT to improve benefits by parties

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